

UDC 004

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EARLY CHILDHOOD CARE & EDUCATION: AN ICT PERSPECTIVE

Resume

In the 21st century, technology serves to reinforce the educational bedrock of any country. Technology has revolutionized the teaching learning process by integrating different source of knowledge - clearly visible from primary to post-tertiary level. This paper examines the introduction of ICT in early childhood years centred on the relationship of ICT with the cognitive, emotional and social development of children. The paper discusses various aspects of the ongoing debate around ICT usage in the early years and tries to answer some of the relevant issues namely, the rationale for early introduction of ICT, the perceived risks and benefits involved in its usage, the role of the parents, and fostering appropriate application of ICT in the early childhood classrooms.

Keywords: Information and Communication Technology, Early Childhood Care Education, Electronic Equipment

A. Introduction

In the recent years, modern societies have changed their perception of the processes involved in early childhood care settings (Lewin, 2000). Nowadays we do not talk anymore about kindergarten but childhood school as an environment where education and learning are possible and supported by a well-defined pedagogical strategy (Essa,2007) that complements all the previous caring activities (Van & Boss, 2002). In this new scenario, families and teachers demand novel requirements: real-time information about centres and its services, tools to track children progress, tips about the upbringing of children, etc. The use of the Information and Communication Technologies (ICT) offers valuable insights. Their use has been established in primary, secondary and high schools for a number of years

now and their benefits have been well documented, in terms of administrative and educational task management, improved motivation, and subject knowledge.

In today's world, ICT is an essential component of our life. Most of the things we use incorporate ICT. What is ICT? Simply stated, it stands for *Information and Communication Technologies*. It can be defined as "anything which allows us to get information, to communicate with each other, or to have an effect on the environment using electronic or digital equipment" (Siraj-Blatchford & Siraj-Blatchford, 2003). In the context of early childhood care education (ECCE), ICT could include different types of hardware and software like computers (including desktop, laptop, and handheld computers); digital cameras and digital video cameras; creative and communication software and tools; the Internet, telephones, fax machines, mobile telephones, tape recorders, interactive stories, computer games, programmable toys and "control" technologies, videoconferencing technologies and closed-circuit television, data projectors, electronic whiteboards etc., (Bolstad, 2004).

B. Why does ICT matter in Early Childhood Care & Education?

The application of technological devices especially in the field of education has facilitated the stakeholders to derive maximum benefit out of the system. There is an increasing demand to integrate ICT with ECCE as the output of ICT is clearly visible at different level of education. Literature suggests three reasons why ICT matters in early childhood education, namely:

B. 1. ICT already affects the people and environments that surround young children's learning

ICT is an essential component of the physical and social worlds of young children's learning and well-being. It is an important part of the private and work lives of most people, including those who support young children's learning and development, whether as parents, family members, caregivers, or early childhood educators. It is often argued in the literature that children's early childhood education experiences should reflect and connect with their experiences in the wider world. There is a strong consensus regarding the role and potential of ICT for the early childhood education sector.

B. 2. ICT offers new Opportunities to Strengthen many aspects of Early Childhood Education Practice

ICT offers:

- An opportunity to support and enhance children’s learning and play experiences.
- Opportunities to support and strengthen practitioners’ professional learning and development.
- Opportunities to support and strengthen relationships and communication between early childhood centres, parents, and other people connected to the early childhood education setting.

Most of the literature about ICT in early childhood education strongly supports the view that technology on its own should never drive the process of ICT development in the sector (Downes & Fatouros, 1995). Rather, all planning for the introduction and use of ICT by children and adults in early childhood education should be grounded in a clear understanding of the purposes, practices, and social context of early childhood education (O’Hara, 2004; O’Rourke & Harrison, 2004; Sheridan & Pramling Samuelsson, 2003). Brooker (2003) has suggested that early childhood care education may actually be leading the way in developing best practice in the use of ICT to support positive learning experiences for children in the age group of 2-5 years.

B. 3. Development and Integration of ICT into Education Policy, Curriculum, and Practice across the whole Education Sector

There is now a strong focus on the development of ICT policy and integration of ICT in curriculum and practice across the whole education sector. ICT and “e-learning” have become important concepts in primary, secondary, and tertiary education. In most countries, policy and curriculum support for the development of ICT in the early childhood education sector has lagged behind those given to the school sector (O’Hara, 2004; Sheridan & Pramling Samuelsson, 2003; Stephen & Plowman, 2003). This situation is beginning to change. Some countries, like Scotland, Britain, and America have recently developed ICT strategies for the early childhood education sector (Learning and Teaching Scotland, 2003). Researchers, academics, and practitioners in early childhood education have also published books, articles, and guidelines which provide information and guidance about ICT in early childhood, and aim to support early childhood education practitioners to make well-informed decisions and choices about ICT (Downes, Arthur, & Beecher, 2001; NAEYC, 1996; O’Hara, 2004; Siraj-Blatchford & Siraj-Blatchford, 2003). From the above studies it is clear that ICT facilitates ECCE in:

- Supporting professional communities of learning among teachers

- Strengthening school-community relationships.
- Increasing the involvement of parents, and other people outside schools, in students' school learning experiences.

C. What Roles can ICT play in ECCE?

There is a growing recognition of the many different ways that ICT can contribute to, or transform, the activities, roles, and relationships experienced by children and adults in early childhood education settings. Table 1 shows some of the ways in which ICT can be part of early childhood education.

Table 1.

Possible Roles of ICT in Early Childhood Care & Education

Roles of ICT

Some examples

Children using ICT in their play or learning (alone, with peers, or with adults)	Children using computers to play games, listen to stories, or draw pictures. Children using ICT equipment in games or role-play activities.
Children and practitioners using ICT together to scaffold children's learning	Using the Internet to locate information or resources, sparked by children's interest in a particular topic or idea.
Children and practitioners using ICT together to document and reflect on children's learning, or to share children's learning with parents, or other practitioners	Taking digital photos, videos, or audio recordings of activities in the early childhood education setting and reviewing these together, or sharing them with parents. Practitioners and children using ICT to build portfolios of children's work, to use for evaluating progress in children's learning and development.
Practitioners using ICT for planning, administration, and information management	Teachers developing individual learning plans for children, or using computer-based templates to plan or document children's learning. Creating databases to keep track of important information about children and their families.
Teachers or teachers-in-training learning to use ICT, or learning <i>through</i> ICT	Teachers-in-training learning to use ICT in their initial teacher education courses. Distance-learning teachers-in-training using ICT to learn to become early childhood teachers. Teachers-in-training learning to use technology with children in their practicum placements. Teachers using ICT to document and reflect on their practice, or using ICT as part of a professional development programme.
Children and practitioners using ICT to communicate or exchange ideas or information with other practitioners,	Using videoconferencing, online discussion communities, or email, to communicate with other practitioners, parents, or researchers, or to share

parents, or researchers	<p>news and information about what’s happening in the early childhood education centre.</p> <p>Children and practitioners using telephones, email, or fax to keep in touch with parents who are not able to come to the early childhood education centre (e.g. parents who are at work during the day).</p> <p>Using telephones, email, or fax to keep in touch with children and their families in distant or rural communities (e.g. Correspondence School early childhood education programme).</p>
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D. An Over View of Research on ICT in Early Childhood Care & Education

Literature related to ICT in ECCE can be broadly classified in five categories. These are: (1) “effects” research; (2) investigations of children’s behaviour while interacting with computers; (3) research into children’s ICT experiences in early childhood education at home; (4) research about practitioners’ professional learning in, or through, ICT; and (5) case studies or exemplars of innovative use of ICT in early childhood education settings. Literature in each of these categories has strengths and weaknesses in terms of the questions it raises, and the information it provides, about the role and potential of computers and other forms of ICT for enriching early childhood education.

D. 1. “Effects” Research

“Effects” research evaluates the impact of technology on young children (Harris, 2001). “Effects” research includes studies that have sought to investigate both positive and negative outcomes from children’s use of computers. Typical research questions include: Does using computers have positive benefits for children’s learning or cognitive development? What effects does computer use have on children’s social behaviour? Can computer games promote aggressive behaviour in children? Dash (2010) mentions that ICT draws the attention of the children in a classroom setting by which the practitioner brings desirable modification in each domain of the child. Interest and motivation are key things which help a child to concentrate on a certain thing for longer period of time. In this case Glabadil (2009) found that ICT encapsulates the children to learn a new skill in a shorter period of time.

D. 2. Investigations of Children's Behaviour and Social Interactions around Computers

Many studies have explored young children's behaviours and interactions with computers, and with other children and adults, around computers in early childhood education settings. Common areas that have been explored include: differences between boys' and girls' behaviour and attitudes around computer use (e.g. Fletcher-Flinn & Suddendorf, 1998); and the degree to which computer use can promote or inhibit collaboration between children, or comparisons of children's behaviour around computer, or interest in, using computers, compared with other kinds of play and activity in early childhood education settings (e.g. Graham & Banks, 2000). Graham and Banks argue that research about what actually happens when computers are available to children in early childhood education settings is needed in order for practitioners to make good judgements about how, and when, to use computers with young children. In such studies, practitioners generally feature in a passive supervisory role. While children playing games through computer in a collaborative setting, their social interaction is reinforced greatly as they completely indulge themselves by unknowingly realising the importance of simulated role (Prayer, 2008). Roznick (2009) found that the interest and motivational level of children while playing around the computers, often tempts them to create such an atmosphere where they can freely share their role playing experience with their peers (Docket; Perry; Nanhohy, 1999). Research of this type often leads to recommendations about the roles that children could or should play in order to support and scaffold children's interactions. For example, guidance to help pupils to create collaborative environments around the computer, to ensure that all children have adequate access and support to use the computer, and to ensure that children's computer interactions are meaningful and have a learning purpose.

D. 3. Research into Children's Experiences of ICT in Early Childhood Education settings at Home

In the two categories of research above, the focus is directly on the child, the technology, and the interactions between them. These studies tend not to frame the investigation of children's learning or behaviour around ICT within the context of children's wider set of learning experiences and environments. However, some researchers have started to piece together a broader picture of young children's access to, ICT in different environments including, but not limited to, their early childhood centre. This includes

research to find out about access to, and use of, ICT across different early childhood education settings (Bain, 2000; Brooker, 2003; Downes et al., 2001; Kankaanranta, 2001), or the relationships between children's ICT experiences at home and in early childhood education settings (Brooker & Siraj-Blatchford, 2002; Downes, 2002). These studies reflect an "ecological" view of young children's ICT experiences. They seek to investigate the interactions between factors in children's home backgrounds and their early experiences of ICT, and how these factors impact on the knowledge, skills, dispositions, and feelings children display around computers in their early childhood education settings. This type of research acknowledges that children in different locations or from different family backgrounds will have different experiences of childhood, and that when it comes to ICT, not all children will be starting from the same point. It acknowledges that children will have different levels of interest, confidence, and prior knowledge and skills when it comes to ICT use. It recognises that some children may have special learning needs, while others may be gifted or talented in some way, and that this must be taken into consideration when supporting young children's experiences with ICT (O'Hara, 2004).

D. 4. Research on Practitioners' Professional Learning in, or through, ICT

Some research focuses specifically on early childhood education practitioners' ICT learning. This includes research on early childhood teachers-in-training learning to use ICT in early childhood education settings (Laffey, 2003; Pollman, 2000); or learning through ICT (Katz, 2003). Research on the integration of ICT into distance education programmes for early childhood teachers-in-training (Higgins Hains, Conceicao-Runlee, Caro, & Marchel, 1999). The use of ICT for early childhood teachers' professional learning has also been studied (Haggerty, 1998; Jordan, 1999; Kankaanranta, 2001; O'Rourke & Harrison, 2004). These studies identify key features of effective ICT professional development for early childhood practitioners. For example, that practitioners' learning about ICT should be connected to their understandings about children's learning and development, and that exposure to examples of integrated ICT use in real early childhood education settings can help practitioners see ways to integrate ICT into their own practice.

D. 5. Case Studies and Exemplars of the use of ICT in Early Childhood Education Settings

Case studies and exemplars of the use of ICT in early childhood education settings are becoming more and more common, particularly in publications aimed at practitioner

audiences. Much of the recent New Zealand literature falls into this category (e.g. Jordan, 1999; Lee et al., 2002; Patterson, 2004; Wilson, Clarke, Maley-Shaw, & Kelly, 2003). These case studies may be the most useful kind of literature for early childhood education practitioners who seek to understand the role and potential of ICT for supporting and extending practice in their centres. Several early (Victoria, Australia). childhood education websites also use case studies to showcase examples of “ICT in action” in real early childhood education settings, for example Early Years Online¹ (Scotland) and SOFWeb.² These case studies are often written by early childhood education practitioners in collaboration with early childhood education researchers. They range from being mostly descriptive, to some which include research into the impacts and outcomes of the use of ICT for children, practitioners, and practice. Some case studies are associated with particular pilot projects or initiatives which aim to support innovation and development of high-quality practice in the use of ICT in early childhood education.

Case studies of ICT use in early childhood education encompass a wide range of technologies, used for a wide range of purposes, but generally include the following characteristics:

- They discuss *how* and *why* ICT was used, and what kind(s) of ICT, with reference to the particular learning goals or experiences that the centre was aiming to achieve;
- They discuss how the ICT use related to particular social, educational, or cultural features of the early childhood education centre;
- They discuss some of the outcomes or benefits of the ICT-related activities for children, for practitioners, or for the wider early childhood centre community (for example, including parents and families);
- They identify problems and challenges, and how these were addressed, and suggest the conditions that helped to support the development of high-quality practice in ICT use; and
- Most case studies also provide recommendations, suggestions, or guidelines for other practitioners based on what the authors have learned in their own centre.

The five categories of research illustrate the broad range of approaches that have been used to investigate the role and potential of ICT in early childhood education. Over time, there has been a noticeable shift in literature. The major trend has been a movement

away from investigating children's experiences or interaction with ICT in isolation from children's wider set of learning experiences. This way of thinking is being replaced by the view that children's interactions with ICT are socially and culturally embedded, and are best understood in reference to the wider set of learning experiences and environments in which children participate.

E. ICT In The Early Years: The Ongoing Debate

In contrast to the above findings, there are a number of studies which go against the integration of ICT in early care settings - the use of computer and other electronic gadgets greatly hampers the natural development of the children (Sinha, 2007). Use of computer in early care centres, significantly hampers the language development of the children and at the same time weakens the sociability nature of the children as the child lives in isolation while playing around the computer (Flayer, 2009) . The present debate worked as a stimulus to explore and balance the pros and cons for the integration of ICT in early care centres.

E. 1. Perceived Risks of ICT usage in Early Years

The increasing pervasiveness of ICT has led some parents, teachers, and children's advocates to question its relationship to the cognitive, emotional, social, and developmental needs of young children. More often than not, the argument is focused on young children's use of computers and computer games and questions are raised on two accounts. Damaging effects of ICT tools on young children are:

- Harmful physical effects of prolonged computer use by children;
- Negative effects on children's social development (such as promote anti-social behaviour like isolation or aggressive behaviour); and
- Developmental concerns (such as computer use can interfere with children's cognitive development).

E. 2. Specific Concerns about the Potential harm ICT tools can cause are

- Exposure to unsuitable content (such as material of a sexual or violent nature, or containing inappropriate gender, cultural, or social stereotypes);
- Computer use may displace other important learning and play activities.

Some researchers condemn the introduction of ICT in the early years on the premise that it is damaging to the development of children in all aspects – physical, cognitive, social, and emotional. Most research on ICT and its impact on young children have focused on the use of computers by them. An argument opposing early introduction of ICT is that as

children learn through their bodies, computers are not developmentally appropriate (Haugland 2000). As a screen-based medium, activities on the computer are not as effective as verbal interaction in developing understanding and skills in the early years (Yelland 1999).

Hohmann (1998) stated that, except for the coordination involved in using a mouse, computers do not support the development of motor activities or motor skills development. He goes on to assert that, although touch typing is a motor skill that can be learned with the help of a computer, it is inappropriate for most children to begin this before they are about 7 or 8. Critical about computer-use in early childhood years, Elkind (1996) stated that computer proficiency does not mean cognitive development, the latter requiring evidence of the development of an underlying concept. He points to the difference between knowing how to use the internet and learning something from it. Healey (1998) cautioned that use of computers is damaging to young children's development as well as their learning. Stating that young children need human support and verbal interaction, she concluded that as computers fail to offer intersensory experiences to enhance learning, they are inappropriate as an educational resource for children below the age of about 7 years as using computers before the age of 7 'subtracts from important developmental tasks', Fomichova & Fomichov (2000) added another dimension to this debate by suggesting that children in economically developed countries spend so many hours alone in front of the computer that a new non-nuclear family system of parents, children and computer has emerged. They refer to the computer as 'intrusion' into the educational system, children's cognition and the family. Yet others believe that computer use might foster learning in a negative sense. For example, solitary game play on computers could lead to children's isolation from social interaction in learning and play, or that violence in computer games could encourage aggressive behaviour. A common concern expressed by most critics is that ICT might displace other important learning and play activities. In fact, Cordes & Miller (2000) call for an immediate moratorium on the further introduction of computers in early childhood, except for special cases of students with disabilities. They take the view that children's use of computers should be sidelined in favour of other kinds of learning and play activities. They argue that computer use in early childhood education about which is inadequate. For instance, there is not enough information on whether or not the radiation emitted by wireless ICT technologies could have harmful health effects for adults and children. There are also

concerns about the physical effects of prolonged exposure to ICT, such as repetitive strain injuries, addiction and sedentary lifestyles. From the above arguments, it appears that the use of ICT may never be a useful strategy to improve the teaching learning process in ECCE centres.

F. Perceived Benefits Of ICT In Early Years

In contrast to the above cited arguments, some educationists advocate that ICT is a great tool to foster the all round development of the child.

F. 1. Using ICT to Support Language Development

Van Scoter and Boss (2002) discuss many ways in which ICT can make rich contributions to children's literacy development, in the four interrelated areas of speaking, listening, reading, and writing. For example, "talking" word processors support young children's experimentation as they play with language. Word processors also offer possibilities for children to compose and write without needing to have mastered the production of letters by hand. Computers in the classroom or early childhood education centre can contribute to a "print-rich" environment.

F. 2. Using ICT to Support Mathematical Thinking and Problem-Solving

Computers and other forms of ICT also have the capacity to support young children to develop mathematical thinking. Clements (2002) reviews research on young children's mathematical learning in conjunction with various forms of computer-mediated practice including the use of drill-and-practice mathematical software, and the exploration of shapes, patterns, and numerical relationships using general-purpose graphics programs, or specialised "computer manipulative" programs in which children are able to perform specific mathematical transformations on objects on screen.

F. 3. Supporting Children from Diverse Cultural or Language backgrounds

ICT may provide unique opportunities for scaffolding and supporting children with special learning needs, or children from culturally or linguistically diverse backgrounds. Good software can allow children to engage in self-exploration and tailor the software to their individual needs in a way that traditional print-based material cannot necessarily match. For example, Castellani and Tsantis (2002) researched the way teachers used software in an ESOL summer school learning programme for 5–12-years-olds in the United States. The software offered opportunities to explore basic concepts such as colour, numbers, and shapes in children's native language, as well as offering the English language

equivalent of these concepts, thereby providing teachers with opportunities to structure the learning environment in culturally inclusive ways. Brooker and Siraj-Blatchford (2002) studied the experiences of 3 and 4-year old children using a computer at an ethnically and linguistically mixed urban nursery school. They described computer use by bilingual children as “especially valuable”. Visual cues and animation embedded in the programs prompted ESOL children to use English words to talk about what they were doing (e.g. “Look! In the house go!”). The researchers regularly noted instances of language learning, and children repeating words and phrases in response to computer-spoken prompts.

F. 4. Supporting Children with Special Learning needs

Bray, Brown, and Green (2004) discuss opportunities that technology offers for supporting learners with a diverse range of special needs or characteristics, including ESOL learners, children identified as having learning disabilities, learners with physical or cognitive impairments, and children identified as gifted and talented. They divide technologies to support diverse learners into two broad categories: assistive/adaptive and learning support. Assistive/adaptive technologies make something physically accessible that would otherwise be inaccessible (for example, screen magnifiers, voice-recognition software, and modified mice or keyboards), while learning support technologies can assist learners through remediation, compensation, or extension. According to Haugen (1998), one special benefit of technology is the many ways in which it can “level the playing field for kids with special learning needs by supporting their efforts to communicate, explore, play independently, or cooperate with a peer”. Haugen cites several American studies in which children and toddlers with disabilities showed more active engagement, enjoyment, and social play during computer activities involving peers and adults than during similarly structured activities away from the computer.

Case studies in the literature support the idea that, when used well, technology can be a valuable tool for supporting children with a range of individual learning needs. For example, Labbo et al. (2000) describe strategies they used with computers in their kindergarten to assist children who were experiencing literacy difficulties. Five-year-old Joey struggled with many aspects of literacy, although he could decode words and read simple text. When using the kindergarten computer, Joey was observed to “window shop”, clicking silently from screen to screen. Joey’s teachers decided to try engaging him in highly focused activities on the computer using a “talking book”.¹¹ The interactive features

of the book allowed Joey to predict which words on the screen might rhyme, and then to check his prediction by clicking the mouse. Labbo's field notes from observations of Joey and his teacher working on the computer illustrate how this approach helped Joey.

G. Effective Application of ICT in Early Childhood Care & Education

For using ICT in early childhood education effectively, it is essential to pay attention to three important elements –a) health and safety issues, b) quality of learning environment and c) developmental appropriateness of ICT.

G. 1. Health and Safety Issues

This can be ensured by paying attention to children's physical and ergonomic safety; prevention from exposure to inappropriate content (e.g. games or Internet-based material of a violent or sexual nature, or containing undesirable gender or cultural stereotypes) and protection of children's privacy (e.g. in online environments, or when information is published on the Internet). A cautious approach is necessary and the practitioners and children need to become well informed about safe and appropriate ways to work with computers. These health and safety issues must be an integral component of the early childhood practice and policy and "general health awareness relating to ICT and computer use should form part of children's learning about ICT, and should certainly form part of any setting's health and safety policy" (Siraj-Blatchford and Siraj-Blatchford 2003). They recommend that children's use of computers should occur in relatively short spells, usually no more than 10 to 20 minutes for 3-year-olds, extending to no more than 40 minutes by the age of 8.

G. 2. Quality of Learning Environment

The physical and technical arrangements such as enhancing children's access to computers and other ICT, placement of computers in the room and type of software available determine the quality of learning environment. It also means taking care of the educational and social features of the learning environment such as nature and quality of children's interactions with, and in the context of, the computer, role of adults in supporting and encouraging children's ICT use, degree to which ICT-related activities connect with other activities in the centre and also the practitioner's broader learning goals. Also important is the careful choice of software for using with children as only good software can allow children to engage in self-directed exploration, and can be tailored to children's individual needs.

G. 3. Development of Appropriateness of ICT

The use of ICT in the early years has the potential to enhance educational opportunities for young children. If applied in a developmentally appropriate manner, it can encourage purposeful and exploratory play, discussion, creativity, problem solving, risk taking and flexible thinking. There are certain points cited below to enhance the appropriateness of ICT in early care centers.

G. 3. a. Ensure an Educational Purpose

Any application introduced to children in order to develop understanding and experience of ICT should not just be enjoyable, although this is important. It should be educationally effective too. However entertaining most arcade-type games might seem, they provide little encouragement of creativity or, indeed, any other worthwhile learning outcome and should therefore be rejected. This is not to suggest that applications should not be fun or used for leisure, only that they should be carefully chosen to have some educational value as well.

Children need a variety of applications which encourage a range of development, including creativity, self-expression and language. Applications should be employed after a thorough discussion with staff and parents.

G. 3. b. Encourage Collaboration

While it is important for children to play alone (and they do this very well), an indicator of quality play, according to Bruce (2001), is also playing collaboratively. There are parallels in the world of computer use. Children can access programs individually, but the best applications provide a valuable means of encouraging collaboration. According to Light and Butterworth (1992), activities requiring 'joint attention' and which involve 'children learn to share' provide a better cognitive challenge for young children than activities where they work alone. Collaboration is also important in providing opportunities for cognitive conflict as children make efforts to reach consensus (Doise and Mugny 1984), and for finding potential solutions together in the creative course of problem-solving (Forman 1989).

Imaginative role-play provides a natural context for children to share play ideas and use resources in imaginative ways. Hats are made from saucepans, cars from wooden blocks, princesses' cloaks from any material at hand. Such resources are important because they provide symbols for the children to play with. Children can articulate their thinking,

enabling them to express ideas which they are still only beginning to grasp intuitively (Hoyles 1985).

G. 3. c. Integrate with other aspects of Curriculum

ICT applications should be integrated as far as possible with other play and project work, and all should work together to help make the curriculum relevant to children. There is a significant problem regarding this issue in much of the current ICT provision in schools. A lot of primary schools are opting for computer suites, which are situated away from the usual play and work areas for children, and thus actively discourage the integration of ICT with the rest of the curriculum for the children. Children need to see ICT used in a meaningful context and for real purposes.

Computer applications provide a means by which children may engage and interact with a much wider range of virtual and audio artefacts and environments than would otherwise be possible. For example, Internet access in one nursery enabled a child to find out about owls. He found a site that showed a live link to an owl's nest and then spent the morning watching owl babies being fed and cared for by parent owls. He astounded nursery staff by managing the whole process himself, not least because he was not yet able to read conventional print. But, in this case, he had made sense of the symbols he encountered because he was engaged in a purposeful activity using a medium he enjoyed working with.

A child's world is rich with symbols of many kinds: traffic signs which may be computerised on motorways; exit and entry directions in shops and public buildings; no-smoking instructions; and disabled-access signals, to name but a few. Developing an awareness of symbols and an ability to manipulate them is clearly important for emergent literacy and numeracy. In the usual course of helping children to develop these skills, practitioners specifically encourage children to recognise the value of using symbols, which can also include spoken or written words and numbers to represent things, quantify them and manage the information. A great deal can be done to promote these processes in the wider play context and also in children's play with technological toys. Many settings use computer programs which manage information as part of their project work so that, for instance, children might collect information on a topic about the body (eye or hair colour, perhaps) and make simple graphs on the computer using these data which will help them to integrate ICT with their natural life.

G. 3. d. Ensure the child is in Control

Generally, ICT applications should be controlled by the child; they should not control the child's interaction through programmed learning or any other behaviourist device. Such an approach promotes directive teaching and is contrary to popular conceptions of good educational practice. There is consensus among informed early childhood educators across Europe about the importance of developing children's early awareness and positive disposition towards literacy and numeracy. And it may very well be the case that programmed learning can operate against these principles. Negative responses can do much to add to sense of failure and low self-esteem, especially among children who offer non-conventional but imaginative responses.

G. 3. e. Choose Applications that are Transparent

As far as possible, ICT applications should provide 'transparency': their functions should be clearly defined and intuitive. In practice, this means that the application can complete each clearly defined task in a single operation. A good example of this is the 'drag and drop' facility on the computer, which literally allows the user to pick an item up with a click, drag it to somewhere else and then drop it in that place with another click. It is a perfect simulation of what happens in real life when something is moved.

G. 3.f. Avoid Applications Containing Violence and Sex.

At early age the children are more prone to learn illogical things as they lack the power of discrimination and critical analysis. While exposing the child to the ICT tools, the practitioner should take care of most sensitive things which may derail the children from their age appropriate track. The children should not be exposed to content that contains objectionable thing like sex and violence. The practitioner needs to ensure that the ICT tools which are being handled by the pupils contains age appropriate learning material which encourage them to work in collaborative environment.

G. 3. g. Be aware of Health and Safety Issues

Serious concerns have been voiced about the consequences of encouraging extended use of desktop computers by young children. *It is therefore advisable that a typical use of any desktop computer application by a child should be comparatively short, usually no more than 10 to 20 minutes for three year olds, extending to no more than 40 minutes by the age of eight.* Clearly, if a child or group of children are totally engaged in an activity and the completion of this requires a longer period at the computer this should be allowed, but it would not be desirable to encourage children to do this regularly.

Where the computer use is integrated with other activities and the computer is used effectively as a tool, for instance in imaginative role play, modelling or painting, children will benefit from greater movement and exercise away from the computer. Use of the computer should not be at the expense of outdoor opportunities and experiences which promote developing essential gross motor skills through running, climbing, jumping, swinging and using wheeled toys. Daily and frequent access to outdoor experiences is essential for all children and their development.

H. Role of Parents in Integration of ICT in ECCE

Research suggests that home–school communication leads to better understanding and more positive attitudes for teachers and parents about each others’ roles. Many studies have shown that children achieve more academically when parents, teachers and children all collaborate towards the same goals (Siraj-Blatchford, I. *et al.* 2002).

Parent involvement is therefore a component of effective schools which merits special consideration. When participation is well planned it can promote higher success in pupils and lead to more successful family environments. Communication between professional educators and parents is crucial in the early years and a more articulated set of aims between the home and early years setting can lead to better outcomes for children. But most teaching faculty members are ill-equipped to know what strategies to adopt to foster better home–school relationships. Research that there is currently very little knowledge in settings about the children’s ICT experiences at home and that these are not areas on which parents are normally asked for information.

By keeping in mind the above facts, the following points ought to be emphasised, namely:

- Parenting skills, child development, and home environment for learning
- Communications from school to home.
- Parents as volunteers in school.
- Involvement in learning activities at home.
- Decision making, leadership and governance.

I. Conclusion

The debate regarding ICT use in early years remains unresolved as indicated by a Scottish literature review of ICT in early childhood education that suggested a “scarcity of good quality research findings on using ICT in educational settings for pre-school children”

(Stephen & Plowman 2002). In the end, it cannot be stated in absolute terms that early introduction of ICT is beneficial or harmful to young children for 'there are far more questions than there are answers about what computer and video games and internet use mean to the social, intellectual and physical development of children today' (Wartella, O'Keefe & Scantlin 2000). Nevertheless it can be stated safely that, with due safeguards in place and ensuring developmental appropriateness, ICT in early childhood education can effectively support and enhance children's learning and play experiences although all of this does demand the practitioners training and skill in the appropriate uses of ICT with children.

REFERENCES

1. *Bain, J.* (2000). Managing computers in teaching and administration in kindergartens. *Computers in NZ Schools*, 12 (1), 21-32.
2. *Bolstad, R.* (2004) *The Role and Potential of ICT in Early Childhood Education: A Review of New Zealand and International Literature.* New Zealand Council For Educational Research, Wellington.
3. *Boss, V.* (2002). *Beginning essentials in early childhood education.* Clifton park, NY. Thomson Delmar Learning
4. *Bray, M., Brown, M., & Green, T.* (2004). *Technology and the diverse learner: A guide to classroom practice.* Thousand Oaks, California: Corwin Press.
5. *Brooker, L., & Siraj-Blatchford, J.* (2002). 'Click on miaow!': how children of three and four years experience the nursery computer. *Contemporary Issues in Early Childhood: Technology Special Issue*,
6. *Brooker, L.* (2003). Integrating new technologies in UK classrooms: Lessons for teachers from early years practitioners. *Childhood Education Annual*, 79 (5), 261-267.
7. *Bruce, T.* (2001) *Learning through play: babies, toddlers and the foundation years*, London: Hodder & Stoughton.
8. *Castellani, J., & Tsantis, L.* (2002). Cross-cultural reactions to using computers in the early childhood education classroom. *Contemporary Issues in Early Childhood: Technology Special Issue*, 3 (2), 274-288.
9. *Clements, D.* (2002). Computers in early childhood mathematics. *Contemporary Issues in Early Childhood: Technology Special Issue*, 3 (2), 160-181.

10. *Cordes, C. & Miller, E. (Eds.) (2000) Fool's Gold: A Critical Look at Computers in Childhood. Alliance for Childhood, College Park, Maryland.*
11. *Dash, J. (2010). Conditions for classroom technology innovations. Teachers College Record, 104 (4), 315-337.*
12. *Dockett, S., Perry, B., & Nanlohy, P. (1999). Computers in early childhood services: A part of the educational program or less time for play? Journal of Australian Research in Early Childhood Education, 6 (2), 165-176.*
13. *Doise, W. & Mugny, G. (1984) The social development of the intellect, Oxford: Pergamon Press*
14. *Downes, T., Arthur, L., & Beecher, B. (2001). Effective learning environments for young children using digital resources: An Australian perspective. Information Technology in Childhood Education Annual, 139-153.*
15. *Downes, T., & Fatouros, C. (1995). Young children learning in their preschool and primary years: A framework for planning to incorporate IT. Australian Educational Computing, May, 4-9.*
16. *Elkind, D. (1996) Young children and technology: A cautionary note. Young Children 51, 6, 22–23.*
17. *Essa, Eva.L. (2007) Introduction to early childhood education(5th edition) Clifton park, NY. Thomson Delmar Learning*
18. *Flayer, E. (2009). A digital snapshot of an early childhood classroom. Educational Leadership, 55 (3), 42-46.*
19. *Fletcher-Flinn, C., & Suddendorf, T. (1998). Computer attitudes, gender and exploratory behaviour. set: Research Information for Teachers, 1 (8), 1-4.*
20. *Fomichova, O. & Fomichov, V. (2000) Computers and the thought-producing self of the young child. British Journal of Educational Technology 31, 3, 213–220.*
21. *Forman, E. (1989) 'The role of peer interaction in the social construction of mathematical knowledge', International Journal of Educational Research, vol. 13, pp. 55–69.*
22. *Glabadil, M. (2007). "Smile, you're on digital camera!" Collaboration between communities, children, and computers. Early Education, 34 (39-46).*
23. *Graham, M. J., & Banks, S. R. (2000). Young children's initial exploration of computers. In D. Rothenberg (Ed.), Issues in early childhood education. Curriculum, teacher*

education, and dissemination of information. Proceedings of the Lilian Katz Symposium, November 5-7. (pp. 357-364). Urbana-Champaign: ECAP collective.

24. *Haggerty, M.* (1998). Sighting, citing and siting Te Whāriki: exploring the use of video feedback as a tool for critical pedagogy. The experiences of five early childhood centres. Unpublished Master of Education thesis, Victoria University, Wellington.

25. *Harris, J.* (2001). The effects of computer games on young children - a review of the research. RDS occasional paper no. 72. London: The Research, Development and Statistics Directorate.

26. *Haugen, K.* (1998). Using technology to enhance early learning experiences. *Child Care Information and Exchange*, 9, 47-56.

27. *Haugland, S.* (2000) Early childhood classrooms in the 21st century: using computers to maximise learning. *Young Children* 55, 1, 12–18.

28. *Healey, J.* (1998) *Failure to Connect: How Computers Affect Our Children's Minds – for Better or Worse*. Simon and Schuster, New York.

29. *Higgins Hains, A., Conceicao-Runlee, S., Caro, P., & Marchel, M.* (1999). Collaborative course development in early childhood special education through distance learning. *Early Childhood Research and Practice*, 1 (1). Retrieved 5 January 2004, from <http://ecrp.uiuc.edu/v1n1/hains.html>

30. *Hohmann, C.* (1998) Evaluating and selecting software for children. *Child Care Information Exchange* 9/98, 60–62.

31. *Hoyles, C.* (1985) 'What is the Point of group discussion in mathematics?' *Studies in Mathematics*, vol. 16, pp. 205–24.

32. *Jordan, B.* (1999). Technological tools supporting the scaffolding of learning. *New Zealand Research in Early Childhood Education*, 2, 53-66.

33. *Kankaanranta, M.* (2001). Constructing digital portfolios: Teachers evolving capabilities in the use of information and communications technology. *Teacher Development*, 5 (2), 259-276.

34. *Katz, Y.* (2003). The use of virtual reality three-dimensional simulation technology in nursery school teacher training for the understanding of children's cognitive perceptions. In G. Marshall & Y. Katz (Eds.), *Learning in school, home, and community. ICT for early and elementary education* (pp. 41-51). Boston: Kluwer Academic Publishers.

35. *Labbo, L. D., Sprague, L., Montero, M. K., & Font, G.* (2000). Connecting a computer center to themes, literature and kindergarteners' literacy needs. *Reading Online*, 4 (1). Retrieved 30 June 2004, from <http://www.readingonline.org/electronic/labbo/index.html>
36. *Laffey, J.* (2003). Appropriation, mastery and resistance to technology in early childhood preservice teacher education. *Journal of Research on Technology in Education*, 36 (4), 361-382.
37. Learning and Teaching Scotland. (2003b). Early learning, forward thinking: the policy framework for ICT in early years. Scotland. Retrieved 25 March 2004, from
38. *Lewin, C.* (2000) Exploring the effects of talking books software in UK primary classrooms. *Journal of Research in Reading* 23, 2, 149–157.
39. *Light, P. & Butterworth, G.* (eds) (1992) *Context and cognition: ways of learning and knowing*, Hemel Hempstead: Harvester Wheatsheaf.
40. *O'Hara, M.* (2004). *ICT in the early years*. London: Continuum.
41. *O'Rourke, M., & Harrison, C.* (2004). The introduction of new technologies: New possibilities for early childhood pedagogy. *Australian Journal of Early Childhood*, 29 (2), 11-18. Retrieved 25 August 2004, from http://www.ansn.org.au/uploads/ORourke_Harrison.pdf
42. *Pollman, M. J.* (2000). Using technology to document children's work. *Journal of Early Childhood Teacher Education*, 21 (2), 261-267.
43. *Prayer, C.* (2008). *Fool's gold: A critical look at computers in childhood*. College Park, Maryland: Alliance for Childhood.
44. *Roznick, A.* (2009). *Beyond quality in early childhood education and care: postmodern perspectives*. London: Falmer Press.
45. *Sinha, J.* "Computers and Advanced Technology in Early Childhood Education", *CATE* 2008, October 2008
46. *Siraj-Blatchford, I., & Siraj-Blatchford, J.* (2003). *More than Computers: Information and Communication Technology in the Early Years*. The British Association for Early Childhood Education, London.
47. *Siraj-Blatchford, J.* (2003) *Developing new technologies for young children*, Stoke on Trent: Trentham Books

48. *Siraj-Blatchford, J. & Whitebread, D.* (2003) Supporting information and communications technology education in early childhood, Buckingham: Open University Press.
49. *Stephen, C., & Plowman, L.* (2002) ICT in Pre-school Settings: A 'benign addition'?: A Review of the Literature on ICT in Pre-school Settings. Learning and Teaching Scotland, Dundee. Retrieved 30 June 2004, from <http://www.ltscotland.org.uk/earlyyears/BenignAddition.asp>
50. *Stephen, C., & Plowman, L.* (2003). ICT in pre-school settings: Benign addition or playroom revolution? *Early Childhood Folio*, 7, 33-38.
51. *Yelland, N.* (1999) Reconceptualising schooling with technology for the 21st century. *Information Technology in Childhood Education Annual* 39–59.
52. *Van Scoter, J., & Boss, S.* (2002). Learners, language, and technology: Making connections that support literacy: Northwest Regional Educational Laboratory. Retrieved 30 June, 2004, from <http://www.netc.org/earlyconnections/pub/index.html>
53. *Wartella, E., O'Keefe, B. & Scantlin, R.* (2000) Children and Interactive Media. A Report for the Markle Foundation. Available from www.markle.org/programs/_programs_children_utexas.stm

ДОШКІЛЬНЕ ВИХОВАННЯ Й ОСВІТА: ІКТ ПЕРСПЕКТИВИ

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Анотація

У 21-му столїтті технологія слугує укрїпленню основ системи освіти будь-якої країни. Технологія революціонїзувала навчальний процес завдяки інтеграції різних джерел знань, починаючи з початкового рївня освіти до післядипломного. Ця стаття досліджує впровадження ІКТ в дошкільну освіту, фокусуючись на взаємовідношенні ІКТ і пізнавального, емоційного та соціального розвитку дітей. Стаття обговорює різні аспекти дискусій, які проводяться щодо використання ІКТ в дошкільній освіті і намагається відповісти на деякі існуючі проблеми, а саме: раціональність впровадження ІКТ у виховання й освіту дітей раннього віку, існуючі ризики і вигоди,

які виникають у разі використання ІКТ, роль батьків, а також заохочення до відповідного використання ІКТ на уроках дошкільнят.

Ключові слова: інформаційно-комунікаційна технологія, дошкільнє виховання й освіта, електронне устаткування.

ДОШКОЛЬНОЕ ВОСПИТАНИЕ И ОБРАЗОВАНИЕ: ИКТ ПЕРСПЕКТИВЫ

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Аннотация

В 21-м столетии технология служит для укрепления основ системы образования любой страны. Технология революционизировала учебный процесс, объединяя различные источники знания и охватывая все уровни образования. В статье исследуется использование ИКТ в дошкольном воспитании и образовании, фокусируясь на взаимоотношениях ИКТ с познавательным, эмоциональным и социальным развитием детей. Статья рассматривает различные аспекты дискуссий, которые проводятся по поводу использования ИКТ в дошкольном образовании, сделана попытка найти ответы на некоторые из соответствующих проблем, а именно: рациональность использования ИКТ в дошкольном образовании, существующие риски и выгоды, которые возникают при использовании ИКТ, роль родителей, а также поощрение в использовании ИКТ на уроках дошкольников.

Ключевые слова: информационно-коммуникационная технология, дошкольное воспитание и образование, электронное оборудование.

Submitted: November 09, 2011