Preface

“Any sufficiently developed technology is virtually indistinguishable from magic.” This famous quote by Arthur Clarke brilliantly describes how technology has advanced in our current global society. Technology has progressed to such an extent that it affects people of all ages, and the field of early childhood education also has been greatly influenced by its progress. However, there has been much controversy about the use of technology and the overall effects on children’s development. While almost every early childhood program has a computer, the controversies continue as to how best use technology when working with young children. Not every use of technology is appropriate or beneficial and research is limited. Before implementing any technology in the classrooms of young children, the design of the curriculum, social setting, teacher technology competence, and program requirements must be examined. Teachers must also consider how to meet the needs of young children from diverse populations. Although many teachers use technology and have such tools available, little is known about how to train teachers or how technology fits into early childhood classrooms.

Since technology is constantly changing, the goals of education have changed, and in turn, technology has changed the notion of what it means to be educated (Morrison, 2007). Even very young children are exposed to technology in their homes. Therefore, early childhood teachers need to be aware of the influence of technology on children, and they also need to develop their skills in using technology to benefit children (NAEYC, 1996). The influence of technology on early childhood education is reflected in research indicating that developmentally appropriate educational computer programs promote young children’s social, emotional, and cognitive development (Blagojevic, 2003; Clements & Sarama, 2003; Fisher & Gillespie, 2003; NAEYC, 1996, Wortham, 2006). However, historically, the use of technology in the early childhood classroom has been debated (Wartella & Nancy, 2000). Some educators note that children can make powerful discoveries through technology, while others report that technology takes children away from traditional concrete activities. In the midst of such arguments, this book can contribute to how early childhood educators as well as early childhood teacher educators can implement and assess developmentally appropriate technology and play for all children.

Computers are increasingly present in early childhood education settings. Toward the end of the 1980s, only one-fourth of licensed preschools had computers. Today almost every preschool has a computer, with the ratio of computers to students changing from 1:125 in 1984 to 1:22 in 1990 to 1:10 in 1997. Not every use of technology, however, is appropriate or beneficial. The design of the curriculum and social setting are critical (Clements, 2006). Teachers of young children are the technology gatekeepers in childcare programs. They are vital to the appropriate use of technology yet little is documented concerning training and understanding of teachers’ use in classrooms. Teachers need to understand how to develop learning, what types of learning should be facilitated, and how to serve the needs of diverse populations using technology. Computers are more than tools for bringing efficiency to traditional approaches; they can open new and unforeseen avenues for learning.
Most educators of young children advocate for a constructivist approach to teaching. This approach supports Developmentally Appropriate Practice for pedagogy applications. During the last 13 years, perspectives on the principle of developmental appropriateness have become more sophisticated. The National Association for the Education of Young Children (NAEYC) is considered the professional society for educators of young children. NAEYC adopted a position statement concerning the appropriate use of technology with children ages 3-8 in 1996. This document primarily addressed the use of computer technology and other technology integrated with computer technology in early childhood settings. NAEYC believes that in any given situation, a professional judgment by the teacher is required to determine if a specific use of technology is age appropriate, individually appropriate and culturally appropriate (NAEYC, 1996). This indicates that the teachers need training and experience in technology applications and analysis.

In writing this book, Technology for early childhood education and socialization: Developmental applications and methodologies, our intention is to provide a guide for all educators who are involved in the lives of young children and are considering how to implement technology in their classrooms. We hope this work helps practitioners examine their beliefs about technology and think about issues that seem relevant across cultures. This book is for educators across the continuum including teacher trainers, university faculty, and classroom practitioners. Some strategies and suggestions described may be well accepted in classrooms already and others provide new insights and ideas for classrooms. Like children, educators have developmental levels of technology understanding and we have tried to address all levels of thinking and skills. We hope to inspire the exploration of different technology applications for teaching young children. Our goal is to address the major issues surrounding technology from an international perspective in order to provide a holistic portrait of technology and early childhood education.

This book offers a critical discussion of how early childhood educators use technology in different cultural settings and how college and university faculty members focus on the appropriate use of technology to provide meaningful and productive learning for children and their teachers as well. The eighth chapter is an overview of what is happening in real schools after our children leave their early childhood programs in the United States. Early childhood teachers’ perceptions and understanding of technology greatly influence the kinds of experiences for and outcomes of young children in the classroom; thus, all educators need to be informed about this topic. To fill this need, we present this book that focuses on international perspectives concerning practical applications of, controversies surrounding and of technologies in order to promote young children’s learning and development. Chapter authors are international and were enthusiastic to share their observations and experiences to make a positive impact on the lives of children and of educators at all levels. Each author’s diverse experiences, pedagogical views, educational practices, and discoveries can support all educators in implementing the innovative use of technology in early childhood education classrooms.

This book, consisting of nine chapters, presents four international perspectives from Japan, New Zealand, Taiwan, and the United States; the relationships between teacher education and technology; special early childhood education and technology; the roles of technology in instruction and assessment of young children; and family involvement and technology. We also describe some helpful links to Online Resources on Technology as a Learning Tool (NAEYC and Authors) in Chapter IX.

ORGANIZATION OF THE BOOK

Chapter 1 offers a case for the philosophy of technology in early childhood teacher education and professional development programs in New Zealand. It is represented in the following six themes: 1) the
importance of critical reflection in teaching practice; 2) the philosophy of technology; 3) the weaving of
technology in Aotearoa/New Zealand; 4) the professional development session, A brief history of ICT
advocacy in ECE; 5) the teacher education sessions, critical understandings of technology in the cur-
riculum, and 6) the concluding statements, visions, and questions concerning technology. This chapter
outlines the core components and philosophy of sessions run with early childhood education student
teachers and early childhood educators to encourage critical reflection of the role of new technologies in
early learning environments. The student teachers were participating in a field-based diploma of teaching
program while the educators were participating in a professional development network. The teachers
were introduced to key assumptions about technology in early childhood education and the impact of
these assumptions on teacher self-perceptions and on their development of strategies to ensure careful
introduction of new technologies into the learning environment

Chapter 2 explores how Japanese early childhood educators implement technology to promote chil-
dren’s socialization skills. Japanese early childhood educators integrate play and technology in order to
support young children’s development and learning in group-oriented environments. The main focus of
Japanese early childhood education is to guide children to develop basic human attributes rather than to
teach them academics, and teachers provide children with age-appropriate technology in order to enhance
play rather than to focus on their academic skills. Through children’s requests, teachers support their
play by providing opportunities to engage in technology-related activities. Examining the ways Japanese
teachers use such activities can provide some insight as to how to implement play and technology for
young children. The use of play as a pedagogical approach is maintained in all Japanese early educa-
tion programs. The teachers of Japan are highly skilled and provide experiences and environments that
teach through play. This approach does not include direct teaching which is common in many programs
in the United States. Children develop higher order thinking skills needed for science and technology
development which is evident and well documented through international tests results of older children
who have come through the Japanese educational system. The role of early childhood in this academic
success may be one of the influencing variables.

Chapter 3 focuses on technology and early childhood education in Taiwan and describes how young
children use technology in the classroom. This chapter presents an overview of early childhood educa-
tion in Taiwan and how Chinese culture has influenced the value of parents’ expectation in education,
as well as how children learn through the use of technology. Children in Taiwan enjoy different kinds
of interactive video games and develop a love of learning. This chapter explains how early childhood
teachers provide developmentally appropriate video games for young children in classrooms. One inter-
esting aspect of the Taiwan educational system is the high level of government support for technology.
Technology education has become a competitive aspect of preschool enrollment and many parents are
placing their children in private schools that use and teach technology rather than public preschools.
Some teachers in these programs have technology degrees. How the early childhood programs com-
bine development and technology to support the government technology requirements is an interesting
story. The role of parents and their expectations of children to succeed is another factor of interest in
Taiwan. Along with technology instruction the parents of most young children want their children to
learn English in these educational programs. Taiwan is another country that consistently scores high on
international tests that measure mathematics and science inquiry thinking. The impact of early childhood
programs is unknown concerning how these countries continue to succeed in the global economy. It is
well documented that both Taiwan and Japan consistently outscore students from the United States on
international comparisons.

Chapter 4 takes an in-depth look at the sweeping reform in preschool education in Mexico. The com-
plexities of the Mexican educational system are explained in this chapter. Mexican preschool education
started with two distinct programs. One to serve social needs and one to serve educational academic development. New reform requires all preschools provide academic focus through appropriate developmental approaches. However, the teacher now must be the deciding influence on how a program works to accomplish this blend of social reform and academic success. There is an overview of technology in Mexico, a comprehensive explanation of new reform efforts, and a description of how technology is used in some of the preschool programs. Mexico is of particular interest because up until 10 years ago it was considered a “developing country” but the Mexican economy has expanded to become the ninth largest in the world. Technology has played a major role in this change. Schools struggle to keep up with the needs of the economy which demands more and more sophisticated technology education. Mexico is a country of contrasts. There are 62 indigenous towns in Mexico, where one of the 80 languages and their variants is spoken. This extensive diversity influences education and how technology is used. While the United States and Mexico are considered different countries they share a common 2,000-mile-long border area where the socio-economic dynamics of two interacting cultures have a strong influence on the educational resources for young children. This area is almost a country within a country. This chapter includes some of the issues concerning the border areas.

Chapter 5 presents ways teacher education institutions use technology to educate and train pre-service teachers of young children. This chapter describes how teacher educators can prepare their in-service teachers to develop technology literacy since all young children need an opportunity to experience and to explore technology at early ages in order to prepare for life in a modern society and to deepen their creative problem-solving and thinking skills. Because technology plays a great role in young children’s learning and development, early childhood educators need to know how to implement technology in their programs and to develop technological literacy for their charges as well as for themselves. The resistance to technology is evident in teacher education programs as well as in the classroom. A teacher education program is only as good as it’s faculty. If the United States wants to produce tech-literate children they have to make sure that their teachers accept and use technology. This chapter includes a brief discussion of the role self-efficacy plays in teacher’s belief systems and gives information about teachers of young children in the United States. Chapter 10 shares new research into what influences teacher’s instructional choices.

Chapter 6 examines how technology is used with young children with special needs. It also includes the legal issues and mandates and the reality of how teachers and schools are dealing with children with special needs in early childhood settings. Information resources and how assistive technology fits into developmentally appropriate practice is described. This chapter explains how early childhood educators can endorse global education which is inclusive through the use of technology. Such education should support children and families with special needs, improve social and political conditions, and move towards a more equity educational process. The role of technology in the assurance of equal access is major. New technologies allow children previously left in resource rooms or grouped in special schools with limited curriculum opportunities to participate in a fuller range of educational opportunities. Technology development continues to insure the global opportunity for all children in early childhood programs to have an equal opportunity for educational and social success. The schools of today must address these issues and provide children the “best possible” learning environment. Technology has been the key influence on this progress in schools.

Chapter 7 describes the roles of technology in instruction and assessment of young children. The chapter also explores current use of different forms of technology in early childhood classrooms and discusses some of the problems that have been encountered in technology use with a focus on computers, including three main issues associated with instruction and assessment with young children: developmentally appropriate use of computers, instructional use of computers and equity issues. There is an overview of
technology used for assessment of early childhood programs and some discussion of appropriate use in instruction. There is advice on how to develop an approach to technology assessment in the classroom and the teacher’s role. A chart that identifies the levels of technology use recommended for children is in this chapter and the different instruction modes recommended for technology instruction is included. An in-depth discussion of the debate about how technology influences development is included in this chapter. Readers will take a close look at how the general population develops tech-fear from undocumented reports and reflect on the difference in opinion and research supported ideas about technology.

Chapter 8 illustrates how early childhood educators can promote family involvement through the use of technology. Parent/family involvement is a key to children’s success in their school lives. This chapter explains the complexities of the relationship between parents or caregivers and children and how these interactions influence learning. Research on literacy acquisition and development is used as an example of how first environments build learning and it is hypothesized that this would apply to technology learning. This chapter looks at three main issues that influence family and children’s technology relationships. These include the Digital Generation Gap which threatens the traditional respect system in families; Equity Issues which are evident between socioeconomic classes and give suggestions for how teachers and schools can help bring equal technology opportunity; and Open Access which is becoming a growing problem as the internet continues to grow and more websites not appropriate for young children are available.

When primary caregivers know how to be involved in their children’s everyday activities in schools, parent and family members are more likely to support their children’s performance. Through the use of technology, parents and family members can be valued sources of children’s successful school lives. For these reasons, this chapter includes ways for early childhood educators to get parents and family members to be involved in their children’s school lives.

Chapter 9 shares the results of a research study concerning use of technology in American schools. The purpose of this study was to examine the current state of technology integration and describe access, instructional activities and use in early childhood and primary classrooms in the United States. The primary research question was: To what degree and in what ways have teachers integrated technology with instruction in early childhood and primary grades? This snapshot shows the actual environment our American children move into after they leave early childhood programs. It gives a clear overview of the realities teachers and children encounter in American schools and summarizes technology use, access, and pedagogy. The compelling evidence from this study that technology use in schools is trivial and that teachers are not using available technology is a grave concern if we are to prepare our children for the Digital Society in which they are not a part. Another concern that is evident from this study is the use of technology for lower level thinking activities that require skill practice and repetitious assignments in the United States. Unlike countries like Japan which integrate technology into play the trend in the United States is to use computers like glorified worksheets. This lower level approach to active cognitive engagement could have a major impact on future academic success for children. One reason we have included this study is to allow readers to see the difference in a research study about technology and a personal opinion piece. Most early childhood practitioners and programs identify research as any article published in an early childhood journal. This, again influences how teachers learn and use technology in their classrooms.

Chapter 10 is Building Epistemic Awareness in the Early Childhood Classroom: Theory, Methodology, and Technology looks at the epistemological influences on technology use of early childhood professionals, children and how conceptual change occurs. Teacher belief’s about learning are a major influence on their instructional behaviors. This chapter helps teachers explore their belief systems about learning and how to approach conceptual change in themselves and young children. This should help
teachers face their “technology demons” as they move into a new era of digital change in early childhood classrooms. The reflective approach to epistemology is important if we are to prepare our children for the challenges they face in the global environment. This chapter connects the ideas from the other chapters and helps teachers understand some of the reasons they made instructional decisions in regards to technology.

Chapter 11 is a resource chapter for early childhood professionals. It was compiled by all contributing authors and contains sources of information the readers might find helpful. It includes website, articles, and books that provide additional information about the topics from our book. This chapter includes developmentally appropriate websites, software, and programs for children and teachers. It also provides comments from children and teachers who have experience with programs and websites. We hope the readers find this useful.

The appendices in this book include reflective checklist, a personal epistemology survey, a graphic organizer to analyze different web sites, and a planning guide for technology use.

Audience: The proposed audience for this book would include university faculty for use in an Early Childhood Technology course, Head Start and Child Care Center teachers and professional development personnel, and public school teachers and administrators working with young children. We propose an international market also for similar childhood programs.

College students and college educators will be our target audience. For example, this book will be part of our early childhood education courses, including ECED 8107/7107 Constructivism in early childhood education, ECED5440/4540 TEP (Teacher Education Program) admission courses and other courses. Also, this book will be highly suitable as a personal reference for early childhood practitioners, for administrators, and for parents of young children. Early childhood educational organizations such as Head Start programs and the National Association for the Education of Young Children, childcare centers, preschools, kindergartens, and primary schools (1st through 3rd grades) would purchase this book for their library use. As a secondary market, both public and university libraries, book stores, book clubs as well as educators, school personnel, educators, and university libraries in Japan, New Zealand, and Taiwan will purchase this book.

It is acknowledged that technology plays a significant role in all aspects of modern society. However, there has been much controversy about the use of technology and the overall effect on student achievement. School districts spend millions of dollars on new technology that they believe will improve student achievement. Many studies indicate that using technology in the classroom does not have a significant impact on student performance (Clark, 1983, 1994; Ravitz et al., 2002). Others indicate technology is valuable in classrooms. In Preparing Teachers for a Changing World, Darling Hammond and others (2005) acknowledge the importance of technology for today’s students and tomorrow’s citizens. While most classrooms have technology tools available and many teachers are using them, teachers need to incorporate the opportunities of the emerging technological infrastructure into their overall curricular thinking (Darling Hammond et al., 2005). For teacher preparation institutions to ensure that teachers know how to use the technologies that are part of professional communities of practice, these need to be infused into the content pedagogy courses that teachers complete.

While we prepare teachers to work in the fast paced world of technology we hope our book helps them gain a better understanding of how important the role of cyber learning is becoming to all children. Most children come to our classrooms aware of technology and comfortable with it. It is up to us as professionals to help them build on their knowledge and prepare them for the communication systems of the future. In order to do this we must overcome any anxiety we have about technology. It is essential that teachers become better prepared to apply and integrate new technology in the service of helping children learn and develop socially, emotionally, and intellectually. We thank you for this opportunity.
REFERENCES


