Kelly L. Heider
Mary Renck Jalongo *Editors*

# Young Children and Families in the Information Age

## Applications of Technology in Early Childhood

# Educating the Young Child

Advances in Theory and Research, Implications for Practice

Volume 10

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# Foreword

# Information Literacy in Early Childhood: What, Why, How, and Where to Next?



Children become adept at using advanced technology at an early age.

**Abstract** This introduction to the volume on young children in the information age begins by defining information literacy within the context of early childhood education. Next, it discusses the importance of information literacy for the field and its place in the curriculum. The introduction concludes with a description of new roles for early childhood professionals—teachers and teacher educators—as they strive to make pedagogy and programs more engaging for and responsive to diverse groups of young children.

**Keywords** Information literacy · Technology · The new literacies

*While shopping at a discount store, I heard—well before I saw—a preschool child and his frazzled grandfather. As the elderly man pushed the cart, the boy continued to sob and beg, "Grandpap, get met iPad" to which the grandfather replied, "But you're not even three yet. You don't know what an iPad is or how to use it…come to think of it, neither do I." In response, the child's pleading grew even louder, "BUT GET IT. BUY IT. GET ME iPAD!"*

There is little question that today's young children are immersed in new technologies in unprecedented ways and, as always, want to participate in what they see adults, older children, and peers doing with electronic devices (Berson and Berson 2010). As media expert Innis (1951) argued long ago, with each new tool that is embraced, the communication environment is irrevocably altered. From printing press to tablet computer, we change—and are changed by—the things we invent.

## What Is Information Literacy?

An ERIC Digest published over two decades ago foreshadowed the direction of those changes: "Education systems and institutions must take seriously the challenges of the Information Age. This includes restructuring the learning process to reflect the use of information in the real world, changing the role of the teacher from presenter of prefabricated facts to facilitator of active learning, and including the library/media specialist as a collaborator in curriculum planning for effective use of information resources" (Hancock 1993, p. 1). Stated in more contemporary terms, education systems need to emphasize information literacy, defined by The United States National Forum on Information Literacy (2012) as "… the ability to know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand."

Taking a somewhat different perspective, information literacy can be conceptualized as a set of competencies that an informed citizen of an information society ought to possess in order to participate intelligently and actively in that society. This includes "skepticism, judgment, free thinking, questioning, and understanding" (Gillmor 2012, p. 1). Thus, information literacy initiatives require a fundamental shift in what Paulo Freire (2000) called the "banking model" of education in which teachers "deposit" information in the minds of learners.

When students are involved in activities to promote information literacy, we would see them:

- seeking a rich range of information sources;
- communicating an understanding of content;
- posing questions about the content being learned;
- using the environment, people, and tools for learning;
- reflecting on their own learning;
- assessing their own learning; and
- taking responsibility for their own learning (Hancock 1993).

## How Has the Communication Environment Changed?

Throughout the world, many, if not most, young children today are in very different communication contexts from those of their grandparents or even their parents. In the days before popular electronic media, it was the adults who "knew" and who shared that knowledge in what they believed to be appropriate ways (Postman 1982). Today, technology has turned the tables to some extent because young children often are adept at using new technologies in ways that outstrip those of their elders. Yet thoughtful examination of these tools—both the advantages that they represent and their drawbacks—is necessary if they are to be more than the latest gadget or heavily-advertised purchase. At the very time when the American Academy of Pediatrics (2012) discourages any screen time for children under two years of age, apps are being heavily marketed to this group with promises of accelerating the learning of the very young. These actions are not without controversy.

The Campaign for Commercial-Free Childhood (2013) invoked the Federal Trade Commission to pursue allegations against the "Baby Einstein" videos, arguing that they did not make children smarter as the advertising claimed. Ultimately, the Boston-based advocacy group's efforts led to successful, nationwide consumer refunds. The Campaign for Commercial-Free Childhood is now pursuing similar charges against mobile app companies, contending that two toy companies—Open Solutions ("Baby Hear and Read", "Baby's First Puzzle") and Fisher-Price ("Laugh & Learn" mobile apps)—are attempting to dupe parents into believing that apps alone can advance their child's learning and language (Boog 2013). Susan Linn, the group's director said, "What babies need for healthy brain development is active play, hands-on creative play and face-to-face interactions." In a statement issued by Kathleen Alfano, senior director of child research for Fisher-Price, she stated that the new apps reflect the company's 80-year mission; namely "to create appropriate toys for the ways children play, discover, and grow" and that the company is now extending "these well-researched play patterns into the digital space" (Boog 2013, para. 6).

Evidently, we are entering an era in which "bells and whistles" and entertainment are insufficient; consumers are beginning to demand evidence that technology is cost effective. This important book on information literacy in early childhood calls upon all of us to confront the contradictory times in which we live for, at the very moment when teachers are being pressured to emphasize memorization of bits of information as a way to improve test performance of students, the virtual tsunami of information demands something very different. It calls for information literacy, the focus of this volume.

## Why Is Information Literacy Important in Early Childhood?

Much of the writing to date on information literacy has focused on secondary and postsecondary students or adults yet, as is the case with so many fundamental concepts, it is clear that information literacy needs to begin much earlier. Perhaps the most compelling support for this statement comes from survey research documenting that young children are using technology and the popular media more often and begin this use much younger. Consider, for example, the following recent statistics:

- Contemporary children spend, on average, 7 h a day on entertainment media, including televisions, computers, phones and other electronic devices (American Academy of Pediatrics 2012).
- Children 8–18 are exposed to the media for 10 h and 45 min a day because, with the use of mobile media, they are "always connected" and usually are multitasking (Kaiser Family Foundation 2010).
- During the summer months, children's television viewing increases by 150 % (Smart Television Alliance 2009).
- Although television watching is not considered to be a suitable past time for children under the age of 2 years, 59 % of children have started watching TV by the age of 6 months (Ofcom 2008).

In response, definitions of literacy have expanded well beyond the traditional subjects of reading, writing, and arithmetic to include a constellation of information processing skills that rely upon critical thinking processes. As David Weinberger (2012) argues, the realities of networked knowledge and the need to assess the quality of information–rather than just locate it—have made this an opportune time to become a seeker of knowledge, but only if a person has learned how. Part of "knowing how," involves the "Big 6" of information literacy, a framework shaped by Michael Eisenberg. In early childhood, the "Big 6" of information literacy are: (1) task definition (finding a focus), (2) information seeking strategies (selecting suitable resources), (3) location and access (obtaining resources), (4) use of information (choosing material), (5) synthesis/sharing (presenting information to others effectively), and (6) evaluation (determining if the task was performed well). The Utah Education Network (2013) has combined the "Big 6" framework with the well-known early childhood High/Scope Curriculum's Plan/Do/Review phases.

## Where to Next?

As early childhood educators, we cannot allow adult enthusiasm to overshadow important questions such as:

- What is the true cost of keeping current with these tools, not only in terms of cash outlay but also with respect to how children spend their time?

- What are the effects on children's well-being—cognitively, physically, socio-emotionally?
- Is the children's learning deeper and wider than it would be without this expensive tool? How can we make pedagogically defensible decisions about Instructional and Communication Technologies during the early years?
- How do we address the perennial issue of the "haves" and "have nots" on either side of the technology gap throughout the world? (Parette and Blum 2013; Simon and Nemeth 2012; Neuman and Celano 2012)
- What are effective ways to introduce the very young to media literacy instruction, defined as the application of principles of information literacy to popular media?

As the esteemed authors of this volume will so amply demonstrate, the capacity to adapt to the perpetually new and challenging landscapes for learning well may be the survival skill of the future. Although early childhood educators cannot afford to be uncritically accepting of innovation, technological advances, and information, they also cannot afford to ignore it and cling to ineffective pedagogies.

What sets this book apart from many others is the clear sense that the authors have truly lived these experiences in information literacy with the very young, their families, and their teachers. Tech-savvy readers will see the familiar tools used in highly effective ways while those who are less familiar with technology will explore new terrain.

Clearly, the call for information literacy in early childhood extends to teacher preparation as well. "The information Age is part of the new reality of working with students in colleges of education. Students turn to the Web as their first (and often their only) information resource—they want their information full text, online, right now" (Repman and Carson 2002, p. 22). Effective approaches to infusing technology and information literacy into teacher education rely on a socio-cultural perspective. As described by Lankshear et al. (2000) it joins together the operational, critical, and cultural dimensions as depicted in Fig. 1.

Thus, early childhood educators at all levels need not only technology skills but also information literacy skills "to inform their teaching practice and to facilitate their ongoing professional development" (Berthelsen et al. 2000, unpaged).

To that end, the *Information Literacy Competency Standards for Higher Education* identify five standards for college students:

1. The information literate student determines the nature and extent of the information needed.
2. The information literate student accesses needed information effectively and efficiently.
3. The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.
4. The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.
5. The information literate student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally (Association of College and Research Libraries 2000).
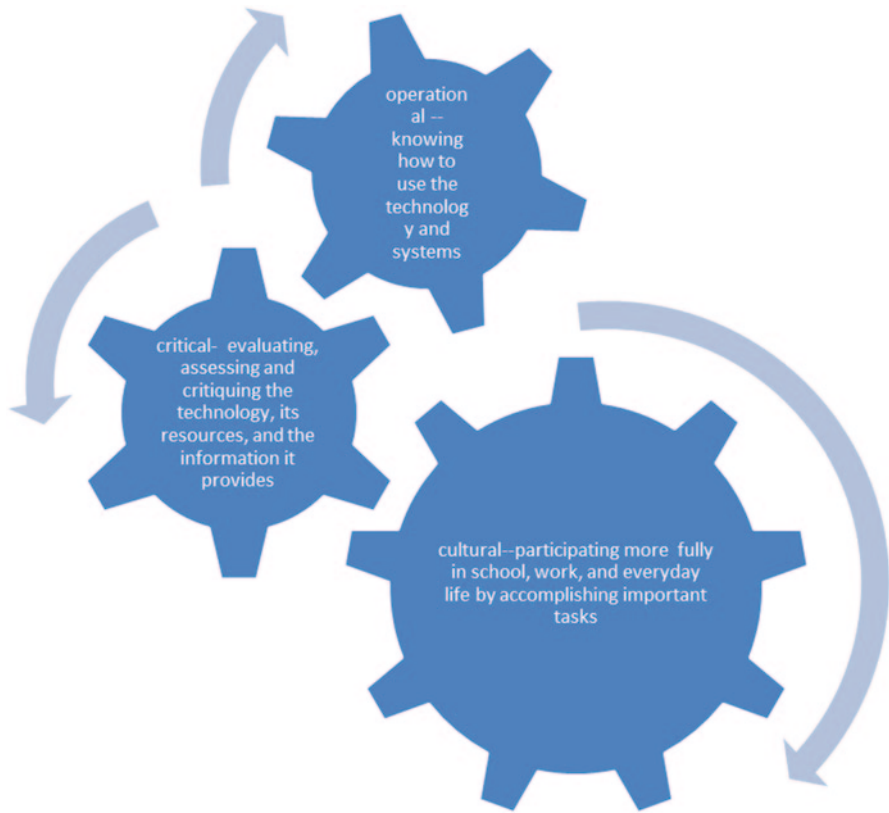
**Fig. 1** The three dimensions of technoliteracy, based on Lankshear et al. (2000)

Many years ago, there was a conference with the provocative title, "If Technology Is the Answer, What Was the Question?" Part of being information literate ourselves is refusing to give over to consumerism, rejecting glib solutions, and reflecting deeply on the consequences of our decisions for young children.

Mary Renck Jalongo

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# Part I
# Tools and Strategies

# Chapter 1
# Virtual Worlds: Young Children Using the Internet

**Ithel Jones and Young Park**

**Abstract** There has been a dramatic increase in the number of young children using digital media. Children are regularly using the internet to play, communicate, and explore. Educators and researchers are beginning to examine the social and cognitive implications of children's use of interactive media and the internet. Socio-cultural and ecological systems theories offer a perspective that can support our understanding of internet use and young children's cognitive development. This chapter examines three popular internet applications: virtual worlds, virtual field trips, and tele-collaborative projects. Drawing on the ecological systems and socio-cultural theories, implications for children's development are considered.

**Keywords** Cognitive development · Digital media · Early childhood · Internet · Socio-cultural theories · Technology · Tele-collaboration · Virtual worlds · Virtual field trip

## An Online World

*Megan is a bright 8-year-old girl from a middle-class family. She lives in a media-rich house with her parents and younger brother. She is an avid reader, and she loves writing stories. She also loves her pet cat, as well as her collection of soft toys and dolls. One of her favorite activities is playing on the computer in her parents' home office. Her daily engagement with technology usually includes going on the internet to visit sites such as Webkins, Club Penguin, and Nickelodeon's Petpet Park.*

*From the moment Megan was born, images of her have been posted online. Her digital life began when her proud parents uploaded prenatal sonogram scans to the internet followed by regular photos and other information. As Megan's digital profile, or footprint, increased, so did her experiences with interactive technologies. As an*

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*active 2-year-old, Megan often begged her mother to take her to the playground. But, instead of heading to the local community park, her mother would settle with Megan in a cozy chair and visit the virtual world of Elmo's Playground on their iPad. Scrolling through family photos on her mother's handheld device would often relieve Megan from the boredom of long car journeys. Then, after a long and busy day, the favorite part of her bedtime routine was to share and talk about a picture book on an e-reader.*

*As a preschooler, Megan enjoyed the challenges of the interactive programs at the computer station. During center time, she and her friend would chat and giggle as they worked together using the SMART Table drawing application. Then, by the time she was in kindergarten, Megan was a frequent visitor to the virtual world of Club Penguin. Having shaped her online presence through the creation and modification of an avatar, Megan played games, communicated, and interacted with other online faces. In this virtual world, she could dress up, purchase virtual goods, and even care for a virtual pet.*

## Changing Childhood

Children like Megan have more access to all kinds of electronic media and online activities than ever before. Changes in media use, and widespread internet use, have drastically altered childhood experiences. For young children, electronic media are part of the landscape and contexts of their lives. The ubiquity of the internet and new online technologies, in particular, permeates all aspects of children's lives. The internet encompasses a diverse, interactive space that blurs the boundaries between the real and imaginary, or virtual world, in ways that we never could have envisioned. One of the most compelling aspects of the internet, however, is its interactivity. Using the internet, children can practice their skills, test their knowledge, or contribute their work using one of the many interactive sites available on the Web.

This chapter examines the ways young children can use the internet to support their learning and enhance their problem-solving skills. First, we explore the nature and extent of young children's use of digital media in the U.S. Next, we discuss children's online access and internet use. In doing so, we consider the social impact of the internet as well as critical dimensions of media technology and the internet that influence young children's learning. Specifically, we examine how using the internet can enrich children's experiences and consider theoretical perspectives concerning how the internet might influence children's cognitive development. Then, finally, we examine three popular online applications including virtual worlds, virtual field trips, and tele-collaborative projects.

## Young Children Using the Internet

According to recent research findings, young children are spending more time using digital media than ever before (Common Sense Media 2011; Gutnick et al. 2011). The various digital media used by children include computers, handheld and console

video game players, cell phones, iPods, and iPad-style tablet devices. In a recent study, the Common Sense Media group (2011) reported that more than half of all children have home access to mobile devices such as smartphones, video iPods, or tablet devices such as an iPad. In addition, more than two-thirds of families with young children have computers, typically with an internet connection (Gutnick et al. 2011). While children's exposure to digital media has significantly increased, so have the capabilities of the various electronic devices. Thus, activities are not restricted to any one type of media. Television, for example, can be streamed via the internet on a desktop computer, iPad, or a smartphone. How and when young children use various digital media, however, is largely determined by their parents or caregivers.

It seems that most parents support and encourage children's use of digital devices. In the United Kingdom, for example, households with young children are more likely to be connected to the internet (Ofcom 2007), and ever-younger children are regularly going online. It was recently reported that almost a third (29 %) of all parents in the United States have downloaded "apps" to their mobile devices for their children to use. Thus, increasing numbers of children are using such apps on mobile devices, including 10 % of 0–1-year-olds, 39 % of 2–4-year-olds, and 53 % of 5–8-year-olds (Common Sense Media Group 2011).

Such use of mobile digital devices is matched by extensive use of computers by children under 8 years of age. More than half of 2–4-year-old children have used a computer and 90 % of 5–8-year-olds (Common Sense Media 2011). It is further reported that young children are regularly using computers, most on a weekly basis and many on a daily basis. A recent trend in computer use is the popularity of portable devices. Since 2005, for example, ownership of desktop computers in the United States has declined by 18 %, while ownership of laptops has increased to 60 % of families (Gutnick et al. 2011). It seems, therefore, that families and children like to use portable electronic media.

Given that children's access to an ever-increasing inventory of electronic devices has increased significantly, it is hardly surprising that they are spending more and more time with media. Indeed, use of all types of media has increased in the last decade and, by the time children are 8 years old, they are spending more than 5 hours a day using media (Gutnick et al. 2011). While television continues to dominate children's media use (Common Sense Media 2011), young children also regularly consume other media, particularly as they mature. Contemporary children from affluent families living in economically-developed countries seem to have an increasing appetite for smartphones, tablet devices, and video consoles, and most are using these technologies to access the internet. Moreover, those children who do go online are doing so several times a week, with usage increasing with age (Gutnick et al. 2011). In short, the internet is rapidly becoming embedded in children's everyday lives.

From 2000 to 2002, internet use among American 6–8-year-old children doubled. In 2003, it was reported that 91 % of children from 3 years old to 12th grade use computers, and 59 % use the internet (De Bell and Chapman 2006). Approximately 23 % of children in nursery school use the internet and 50 % by third grade (De Bell and Chapman 2006). Such widespread internet use by young children raises many questions concerning access, as well as the nature and quality of use. In addition, practitioners and parents have voiced concern about the appropriateness of technology use by young children. According to Simon and Memeth (2012), these include concerns that:

- children spend too much time with technology and that it will dominate their activities
- infants and toddlers are being forced to use technology
- children will be exposed to inappropriate content and inappropriate marketing

Similarly, early childhood educators fear that using technology will lead to negative effects on children's imagination and creativity and their socio-emotional development (Cordes and Miller 1999). In addition, there is some concern that children are less active when they use digital media and that this could contribute to childhood obesity and other health problems (Strasburger et al. 2011).

Despite these concerns, young children are going online; and they are doing so at younger and younger ages. Professional organizations such as the National Association for the Education of Young Children (NAEYC), however, recognize that "technology and interactive media are here to stay" (NAEYC 2012, p. 2). In their most recent position statement concerning the use of digital media in early childhood programs, the NAEYC paved the way for early childhood educators to embrace digital media, albeit with some degree of caution. Although they voiced concern about conflicting evidence on the value of technology in children's development, they adopted the position that "technology and interactive media are tools that can promote effective learning and development when they are used intentionally by early childhood educators" (NAEYC 2012, p. 5). What, then, are the benefits of the internet and digital media for young children? In the following paragraphs we discuss the internet and analyze components that may be pertinent to children's learning and development.

Essentially, the internet is a system of interconnected computer networks. The internet encompasses communication from one-to-many, one-to-one, and many-to-many. Since its widespread use beginning in the 1990s, the internet had a significant cultural impact including increases in communication using email and interactive video calls, the world wide web with forums and blogs, as well as social networking and online commerce. In fact, there is hardly any aspect of the lives of individuals living in developed countries that has not been transformed by the power of the internet including entertainment (e.g., video and audio), education (e.g., online courses), electronic business, telecommuting, crowd sourcing, politics, and philanthropy.

In considering internet use by young children, perhaps what is more important is, not so much the range of computer connections, but its social and cognitive affordances. That is, the social and cognitive actions that are made possible and enhanced through the use of computer technologies. These affordances include communication, connectivity, access to information and, most importantly perhaps, interactivity. Simply put, the internet can be viewed as a cognitive tool. The internet allows information to be instantly available to everyone. At the same time, it allows for input and response from the user. It is this interactive aspect that potentially leads to social and cognitive outcomes for young children. Indeed, there is increasing evidence that use of the internet is associated with positive social and cognitive benefits for children (Greenfield and Yan 2006; Johnson 2006; Young 2007).