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FOR COMMUNICATION,

COLLABORATION,

AND CREATIVE CHANGE.
TECHNOLOGY IN THE LIVES OF EDUCATORS
AND EARLY CHILDHOOD PROGRAMS

Summary

In 2012, the National Association for the Education of Young Children (NAEYC) and the Fred Rogers Center for Early Learning and Children’s Media at Saint Vincent College released the joint position statement, Technology and Interactive Media as Tools in Early Childhood Programs Serving Children Birth through Age 8. The research-based position statement responds to the rapidly expanding public interest in digital media for young children, matched and spurred by the growing market—and marketing—of these new technologies for early childhood education.

The current study follows up the 2010 survey conducted by the Fred Rogers Center, Northwestern University, and NAEYC to gauge the environment for adopting the principles and recommendations of the position statement. This report on findings from the 2012 survey of a cohort of 1,457 early childhood educators examines current school and program practices regarding technology use, the nature of technology support provided to educators, and ways that educators currently are using technology and digital media in the delivery of early childhood education.

Key Findings

• NAEYC-Fred Rogers Center Position Statement: Only 25% of respondents to the survey, administered in Fall 2012, were aware of the position statement, which had been released and announced to all NAEYC members six months earlier, in March.

• Technology Access: Access to digital cameras (92%), desktop or laptop computers (84%), and TVs/DVDs (80%) was high. Respondents reported less access to newer technologies such as tablet computers (29%), interactive whiteboards (21%), iPod/MP3 players (21%), e-readers (15%), or iPod Touch devices (15%).

  » Education: Higher levels of education for survey respondents predicted higher levels of access to newer technologies.

  » Program: School-based programs were more likely to have interactive whiteboards and tablet computers compared to center- or home-based programs.

  » Socioeconomic Status (SES): Students from middle-income families were less likely to have access to tablet computers in their early childhood programs compared to students from higher-income families.
• **Technology Use**: Use of technology in all types of programs represented in the survey varied substantially but was generally low. Digital cameras (61%) and computers (45%) were used most often. Of respondents who had access to interactive whiteboards and tablets, more than 50% used them at least once a week.

  » **Program**: Home-based child care programs used TVs/DVDs more often than did school- and center-based programs and also were more likely to use e-readers. School-based programs used computers more often than did home- and center-based programs. Center-based programs also were more likely never to use tablet computers compared to school-based programs.

  » **Learning Areas**: Survey respondents reported using specific types of technology for instruction in certain learning skills. The majority of respondents (74%) reported using digital cameras in the area of social-emotional development. Most respondents with access to interactive whiteboards, tablets, and computers tended to use these tools for academic subject areas such as literacy, math, and science.

• **Attitudes**: Respondents generally believed that technology has a positive role in children’s learning. Specifically, they reported believing that technology can help to document children’s learning and is useful for individualized learning. Younger educators, ages 20-39, held more positive beliefs about technology than did educators age 40 and older.

• **Technology Integration**: A large proportion of respondents reported a high degree of confidence in using all types of technology but also indicated several barriers to integrating technology into their programs. Thirty-nine percent of respondents reported being limited by insufficient or lack of technical support, and 57% of respondents reported they receive professional development in technology once a year or less.
The Center on Media and Human Development at Northwestern University conducted the 2012 survey and prepared this report in partnership with the Fred Rogers Center for Early Learning and Children's Media at Saint Vincent College. We would like to thank the National Association for the Education of Young Children (NAEYC) and Roberta Schomburg, Ph.D., Associate Dean and Professor of Early Childhood Education, Carlow University, Vice President of the NAEYC Governing Board, and Fred Rogers Center Senior Fellow, for their assistance in distributing the survey.

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Introduction

In March 2012, the National Association for the Education of Young Children (NAEYC) and the Fred Rogers Center for Early Learning and Children’s Media at Saint Vincent College released a joint position statement on developmentally appropriate practice in the use of technology and interactive media in early childhood programs for children from birth through age 8 (NAEYC-Fred Rogers Center, 2012). This statement provides guidance for the intentional, appropriate use of wide-ranging technologies and interactive media (including digital cameras, interactive whiteboards, digital tablets, and computers) for early learning and development. Two years ago, during the process of researching and developing the position statement, the Fred Rogers Center, Northwestern University, and NAEYC examined technology use across different early childhood education programs. This previous study determined that technology use differed by program type, but overall, technology was rarely used (Wartella, Schomburg, Lauricella, Robb, & Flynn, 2010). In the past two years, there has been a rapid expansion in public interest in digital media for young children, in the digital media market for the early childhood education sector, and in technology-focused professional development for early childhood professionals. Findings from the more recent 2012 survey summarized in this report by the Center on Media and Human Development at Northwestern University in partnership with the Fred Rogers Center reflect these changes while also suggesting the continuing need for greater awareness and understanding of the role and the impact of technology and interactive media.

NAEYC-Fred Rogers Center Position Statement

The statement asserts principles and recommendations for the intentional, planned, and developmentally appropriate use of technology and interactive media. The statement defines interactive media as “digital and analog materials, including software programs, applications (apps), broadcast and streaming media, some children’s television programming, e-books, the Internet, and other forms of content designed to facilitate active and creative use by young children and to encourage social engagement with other children and adults.” Acknowledging the increasingly widespread use of technology and interactive media among even very young children, the position statement includes the following key messages.

1. Technology and digital media can be effective tools in early childhood education when used intentionally and appropriately, taking into consideration each child’s age, developmental abilities, and social and cultural life context. Under optimal circumstances, technology and digital media should be used when the content can enhance other activities, such as “creative play, exploration, physical activity, outdoor experiences, conversation and social interaction.” For children with special needs, assistive technology can be an effective tool for learning.

2. Early childhood programs should provide equitable access to media technologies for children across socioeconomic groups, including children from low-income homes and from non-English-speaking families. Programs also should support the development of digital citizenship—the ability to think critically about media—for all children.
3. Recommendations of public health organizations regarding limits on media use should be considered, such as limits on screen time for young children (typically two hours or less per day for children older than 2 years), especially for the youngest children from birth to age 2. Media use with infants and toddlers should be limited to activities that support responsive interactions with caregivers. For young children of every age, media use never should involve exposure to violent or sexualized content and never should be emotionally damaging, physically harmful, or exploitative.

4. Early childhood programs should provide ongoing professional development to ensure that teachers and administrators have the “information and resources to effectively select, use, integrate, and evaluate technology and interactive media tools in intentional and developmentally appropriate ways.”

The NAEYC-Fred Rogers Center position statement is intended to help advance quality in early childhood programs by encouraging and supporting openness to technology and interactive media as valuable resources for teaching and learning. This will require ongoing professional development as well as increased access to current and emerging tools. Findings from the current survey can help inform the focus and delivery of professional development that empowers early childhood educators to optimize the potential of technology and digital media in their early childhood programs. It could be expected, in turn, that educators’ increased confidence and informed intentionality in selecting and using digital resources will have an impact on the availability of innovative new content for effective early learning.

2010 Fred Rogers Center Report on Technology Use

The current report is a follow-up to an earlier Fred Rogers Center report on media use across all types of early learning settings including school-based programs and family child care (Wartella et al., 2010). In Spring 2010, NAEYC and the Fred Rogers Center conducted an online survey of all NAEYC members regarding their attitudes toward using technology with young children as well as their access to media technologies. Overall, the 2010 study found that family child care providers were more likely to use media technology with young children compared to use by teachers in school-based programs. Further, there was a range of different types of technology in classrooms. Nearly all teachers reported having access to audio technology (such as CD players, radio, or cassettes) in their classrooms, and 59% reported having computers. Less than one-third of teachers reported having any television-based technologies such as TVs, DVDs, or videocassettes (Wartella et al., 2010). Most of the survey respondents, regardless of program type, thought that the youngest age at which children should be introduced to technology was between 3 and 4. The 2010 survey did not examine the specific learning areas in which media technology was integrated, nor could it account for the extent of use for newer devices such as e-readers and tablet computers.
Current Report

The current study provides an update on the early childhood education technology environment as of Fall 2012. As early childhood educators adopt new technology practices over time, it is useful to examine school policies on technology use, the nature of technology support provided to educators, and educators’ actual use of media technology in early childhood programs. In the context of the NAEYC-Fred Rogers Center position statement, this report identifies baseline information for tracking the statement’s impact on the field and helping to shape supportive professional development for early childhood educators.

Survey Sample and Methodology

Respondents. Online survey data were collected in Fall 2012 from 1,457 early childhood educators. Respondents were NAEYC members who received the survey by email through the NAEYC listserv. Because NAEYC membership includes not only early childhood educators but also higher education faculty, researchers, and other professionals, the survey screened participants to represent only early childhood educators working with children from birth through age 8. The majority of respondents were female (98%) and white (86%), with 5% African American, 4% Hispanic, 2% Asian American, <1% Native American/Alaskan Native, <1% Hawaiian Native/Pacific Islander, and 3% of mixed racial background. The average age of survey participants was 48 years (SD = 10.9), with a range from 20 to 76 years. The median annual family income was between $61,000 and $70,000, which is slightly higher than the national average family income of $50,502 (U.S Census Bureau, 2012). Participants represented 48 states (excluding Mississippi and West Virginia) and Puerto Rico, as well as Canada and Europe. Almost half (45%) of participants taught in suburban areas, 35% taught in urban settings, and 20% taught in rural settings.

Respondents had been working in the classroom for an average of 20.3 years (SD = 10.7). Many respondents indicated that they served more than one age group, with 40% serving children birth to 2, 84% serving children ages 3-4, 44% serving children ages 5-6, and 12% serving children ages 7-8. The respondents’ program types varied, with 48% working in center-based care (i.e., for- or non-profit, non-school-based care such as YMCA or Bright Horizons centers); 34% in school-based care (public or private programs within K-12 school programs); 11% in Head Start or Early Head Start centers; and 7% in home-based child care. There was variation in the socioeconomic status of children served, with 43% of educators working with children from low- or lower-middle-income homes, 33% with children from middle-income homes, and 24% with children from upper-middle or upper-income homes. In terms of educational attainment, 37% of respondents had a graduate degree, 40% had a 4-year college degree, and 23% had a high school degree or less. A quarter of respondents had no specific training or only some coursework in early childhood education.

Procedure. Based on previous research by Wartella et al. (2010), McManis, Simon, and Nemeth (2012), and Ertmer (1999), researchers in this study developed an original survey instrument that asked participants about their access to and use of multiple technologies, including traditional platforms such as TVs/DVDs and computers as well as newer mobile technologies such as iPods, e-readers, and tablet computers. Survey questions also addressed educator attitudes and beliefs toward technology use in early childhood education and the extent of their access to technology-focused professional development.
Coding. Respondents indicated the type of their center or program. To simplify the analyses, the respondents’ program types were grouped into four mutually exclusive categories: School-based, Center-based, Head Start, and Home-based (see Figure 1). School-based consisted of all programs—both public and private—associated with an elementary school. For example, pre-K through a public school would constitute a school-based program. Center-based care consisted of programs that were not associated with an elementary school, home child care provider, or Head Start center. Head Start consisted of Head Start and Early Head Start centers. Home-based programs consisted of all care that took place outside of a center or school and was reported by respondents as being either home-based or family care.

Figure 1. Respondents by program type

Findings

Technology Statement and Policies. Only 25% of the entire sample was aware of the 2012 NAEYC-Fred Rogers position statement, and less than half of the respondents reported having a school technology policy. If respondents reported a school technology policy, 26% indicated that the policy encouraged responsible handling of devices, 24% said the policy provided pre-approved content, 23% indicated that the policy included time use restrictions, and 16% reported the policy mentioned the integration of technology across the curriculum. Only 6% of all respondents reported having a specific technology curriculum in their program.

Technology Access. Overall, the majority of respondents reported having access to digital cameras (92%), desktop or laptop computers (84%), and TVs/DVDs (80%). Less than one-third of all respondents reported having tablet computers (29%), interactive whiteboards (21%), iPod/MP3 players (21%), e-readers (15%), or iPod Touch devices (15%). School-based programs were more likely to have interactive whiteboards and tablet computers than were the other program types. There were also differences in technology access by children’s family income level. Students from middle-income homes were less likely to have access to tablet computers compared to children from upper-income homes, who had the most access to tablet computers.

Figure 2. Percent of respondents who reported having access to technology
Technology Access by Respondents’ Education Level. There was a strong relationship between respondents’ highest attained education level and their access to newer digital media. A graduate degree was associated with greater access to iPod/MP3 players (25%), iPod Touch devices (19%), and tablet computers (35%), compared to a high school degree or less (16% iPod/MP3 players, 11% iPod Touch, and 20% tablet computers). Access to all devices for respondents with a 4-year degree was greater than for those with a high school degree but less than for those with a graduate degree.

Frequency of Use by Technology Type. The frequency of respondents’ technology use varied considerably. Across the entire survey population, technology often was not accessible, or it was used infrequently. The exceptions were digital cameras and computers; across all respondents, these were used the most often, with more than half (61%) using digital cameras, and 45% using computers, at least once a week. TVs/DVDs were used infrequently, with only 12% using them at least once a week. Only 15% of respondents used tablets, 13% used interactive whiteboards, and 10% used iPod/MP3 players at least once a week, while iPod Touch devices (5%), and e-readers (4%) rarely were used.

As might be expected, the frequency of use tended to be greater for the subpopulation of respondents who reported having access to specific technologies. The frequency of use increases especially for interactive whiteboards and tablet devices, with 60% of respondents with access using interactive whiteboards, and 52% using tablets, at least once a week. The majority with access used digital cameras (67%) and computers (54%) at least once a week. There was a major difference in the frequency of use for those with access to mobile devices. Nearly half (49%) of respondents with iPod/MP3 players, 44% with iPod Touch devices, and 25% with e-readers used these technologies at least once a week. Although 80% of all respondents reported access to TVs/DVDs (see Figure 2), only 16% reported using this technology at least once a week; 35% reported never using them, and 36% used them less than once a month.
Technology Use by Program Type. The use of technology was low for all program types, but there were some differences for programs with access to specific technologies. Home-based programs (24%) were more likely to use TVs/DVDs daily compared to school- (6%) and center-based programs (3%). Home-based programs (28%) also were more likely to use e-readers daily compared to school-based programs (7%). School-based programs (41%) were more likely to use computers daily, compared to home-based (24%) and center-based (31%) programs, while center-based programs (35%) were more likely never to use tablet computers, compared to school-based programs (18%).

Technology Use by Learning Area. Seventy-four percent of the respondents reported using digital cameras in the area of social/emotional development, for activities such as modeling, roleplaying, and documenting children’s learning. On the other hand, most respondents with access to interactive whiteboards, tablets, and computers tended to use these technologies most often in the academic subject areas of literacy, math, and science. Four out of five respondents reported using interactive whiteboards and tablets for teaching literacy, and three-fourths of respondents reported using computers for this subject. Nearly 80% of respondents reported using interactive whiteboards for teaching math, and two-thirds reported using tablets and computers for math. About half of the respondents used tablets and computers for teaching science.
Attitudes Toward Technology. Overall, respondents believed that technology has a positive role in children’s learning. About 88% believed technology helps to document children’s learning; 72% believed technology is useful in individualized learning and for teaching content knowledge; and about 40% felt that technology influences higher order thinking skills and critical thinking. Younger respondents (aged 20-39) held more positive beliefs about the ability of technology to aid children’s learning, compared to the beliefs of older (40 and older) respondents.

Program Differences and Educator Attitudes. There were no differences in respondents’ beliefs about the appropriate age technology should be used with young children in an educational setting. The majority of respondents (52%) believed that technology should be introduced when children are 3 to 4 years old. However, there were some differences in attitudes between respondents from Head Start programs and others. Approximately one-third of Head Start educators believed technology could promote individualized learning, critical thinking, higher order thinking, and content knowledge, compared to less than one-fifth of center-based educators. More than half of Head Start educators agreed or strongly agreed that they were limited by perceived access and support barriers, compared to roughly one-third of respondents from all other programs. Educators in Head Start and center-based programs also were more likely to feel limited by school and parent approval policies regarding technology use in classrooms, compared to educators from school-based programs. Compared to other programs, Head Start educators also believed that children used more technology in school than at home.

Confidence in Using Technology. Respondents reported a high level of confidence in using all types of technology. About 75% said they were somewhat or very confident using e-readers, iPod/MP3 players, the iPod Touch, and interactive whiteboards, and nearly nine in ten reported high confidence in using digital cameras, computers, TVs/DVDs, and tablet computers.

Figure 7. Respondents who were somewhat or very confident using technology

Barriers to Technology Integration. When respondents were asked about the barriers they perceived to the integration of technology in their programs, 39% agreed or strongly agreed that they were limited by insufficient or lack of technical support. An equal percentage reported insufficient or lack of training as a barrier, and 25% agreed or strongly agreed that they lacked appropriate digital content for their students. About 20% were unsure of how to make technology relevant to specific early childhood learning areas.
Professional Development. Only 42% of respondents received any pre- or in-service training specific to educational technology. Of these, 94% received in-service professional development in technology several times a year or less, with 57% reporting technology-focused professional development only once a year or less. Forty-eight percent reported the most effective professional development for integrating educational technology into early childhood classrooms and programs to be in-person workshops, while 24% noted help from a colleague was most effective. Only 8% of respondents felt online coursework was the most effective. When asked to rate their programs on the level of support they received, one-third of the respondents felt their programs provided little or no support in understanding how to integrate technology into specific subject areas, in developmentally appropriate models for using technology, and in the form of financial resources.

Discussion

Findings from the 2012 survey reported here point to both challenges and opportunities for empowering early childhood educators to mine the potential of technology and interactive media in ways that enhance the quality of their programs in schools, centers, and home-based early learning environments. The survey finding that only one-fourth of the respondents were aware of the national NAEYC-Fred Rogers Center position statement clearly signals the need for greater communication and awareness. The extent of early childhood educators’ access to the full range of technologies is another important challenge to be met. Although the majority of respondents to the 2012 survey had access to TVs/DVDs, computers, and digital cameras, there was considerably less access to newer, mobile devices—except for respondents with higher levels of education and those working in programs serving children from higher-income families.

Among the large proportion of survey respondents who did report access to a range of technologies, these tools were not necessarily used frequently. Only one-third to one-half of those with access actually used technology at least once a week or more, suggesting that a large number of early childhood educators do not use the technology available to them. This is in contrast to reported high levels of confidence in their ability to use technology and their belief that technology can aid children’s learning. Given the history of controversy over the place of technology in the lives of young children, educators might feel they must make an all-or-nothing choice between technology and the concrete manipulatives, pretend play, and social interactions that indisputably are so important to early learning and development. Further, although many educators might feel confident, they might not necessarily be prepared to integrate technology and interactive media into their programs in developmentally appropriate ways.

The survey results regarding the reported lack of professional development should be a call to action. Although some of the survey respondents received technology-focused, in-service training several times a year, more than half received little or none. This survey’s findings of relatively high levels of educators’ self-confidence in their ability to appropriately integrate technology, combined with their general belief in the educational potential of technology and digital media, suggest an important opportunity for approaches to sustained professional development that support and fully engage early childhood educators in digital learning communities.
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