

TECHNOLOGY IN THE LIVES OF EDUCATORS AND EARLY CHILDHOOD PROGRAMS: 2018 SURVEY

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Summary

Today's young children are living in a world that is increasingly reliant on media and technology. As a result of the rapidly changing digital landscape, the National Association for the Education of Young Children (NAEYC) and the Fred Rogers Center delivered a joint position statement in 2012 outlining best practices for incorporating media and technology in early childhood education programs.

Since the release of NAEYC/Fred Rogers Center position statement, not only has mobile media access and use become nearly ubiquitous in U.S. households and amongst the youngest users (Rideout, 2017), but digital technology has become a mainstay in the majority of U.S. early childhood classrooms. In 2014, U.S. early childhood educators reported a nearly two-fold increase in tablet computer access in their classrooms from just two years earlier (55% vs. 29% in 2012; Blackwell, Wartella, Lauricella, & Robb, 2015).

The impact of this statement cannot be underestimated. In fact, compared to 2012 when only 25% of early childhood educators said they were familiar with the statement, by 2014, 52% reported familiarity (Blackwell et al., 2015). Even more impressive, at the 2017 NAEYC Annual Conference, there were 13 sessions on technology, including one featuring the position statement authors.

Given the proliferation of technology and the recent 6-year anniversary of the NAEYC/Fred Rogers Center position statement, the current report presents updated trends on early childhood educators' access to and use of technology as of January 2018. Additionally, the report describes educators' awareness of and familiarity with the 2012 position statement to better understand its impact on the field of early childhood education.

Key Findings

Statement Awareness

Since 2014 there has been no difference in the percent of early childhood educators who are familiar with the NAEYC/Fred Rogers Center position statement regarding technology use in early childhood education. Fifty-two percent of educators reported knowing about it in 2014 and only 53 percent reported knowing about it in 2018.

Access & Use

Early childhood educators report that their access to technology has increased since the 2014 survey, especially access to newer technologies like tablet computers, interactive whiteboards, and e-readers. However, there was significant variability in frequency of using these technologies by program type, occupation status, and age of children served.

Professional Development & Support

Since 2014 there has been little difference in the percent of early childhood educators who report ever receiving professional development in educational technology (49% v. 51% in 2018). Despite this small difference, educators felt that they had considerable support in using technology to communicate with parents or caregivers and general technical support. However, respondents felt less supported in finding/navigating digital media resources and content as well as making technology relevant to different subject areas.

Confidence With & Attitudes Towards Technology

Educators reported a fairly high level of confidence in using technology for instructional purposes in a developmentally appropriate way. Similarly, their attitudes towards technology were generally favorable or neutral.

Introduction

Young children living in today's media saturated world are presented with media and technology choices at every turn (Rideout, 2017). From the latest technologies in smartphones and personal computers to the growing multitude and permanence of education-focused games and applications (apps) to even faster and more complex internet systems, it is now more important than ever to consider all of the experiences of young children growing up in a highly digital world. Early learning environments represent one context in which young children may interact with media and technology. With nearly 65% of U.S. 3- to 5-year-old children enrolled in some type of preschool program, and almost 19% of preschoolers enrolled in full day programs (National Center for Education Statistics, 2017), a large proportion of young children in the U.S. have opportunities to encounter novel media and technology outside of the home environment.

Given the unprecedented pace of new technological advancements, the conversation around utilizing digital media in early childhood classrooms steadily increased, eventually leading to the 2012 National Association for Education of Young Children (NAEYC) and Fred Rogers Center joint position statement on the topic (NAEYC & Fred Rogers Center, 2012). The statement continues to be relevant for teachers to consult as it outlines the best practices for incorporating technology in the preschool classroom according to the frameworks of developmentally-appropriate practice (Copple & Bredekamp, 2009).

Indeed, early childhood education centers have largely embraced the digital world in tandem with the proliferation of young preschoolers' use of mobile devices in the home, but this adoption is often dependent on the resources of the school. In two national surveys of early childhood educators administered in 2012 and 2014, Blackwell et al. (2015) found that the majority of educators had access to several different technologies (i.e., TV/DVDs, computers, digital cameras, and tablet computers) in their classrooms, but only a small minority of teachers had access to more niche devices such as interactive whiteboards and e-readers (26% and 20%, respectively in 2014). The greatest difference from the survey done in 2012 to the one in 2014 was a significant increase in the proportion of educators that reported access to tablet computers (55% compared to 26% in 2012). This increase was also felt by teachers who work with lower-income populations. That is, despite income level, all children in preschool programs had more access to the newest information and communication technologies, especially tablet computers (Blackwell et al., 2015).

In this report, we investigate the current landscape of technology access and use in early childhood education, especially considering the rapid uptake of mobile devices in recent years. Additionally, we examine the extent to which educators and administrators felt that their programs supported technology use and provided professional development around developmentally-appropriate implementation in the classroom, a key aspect of the 2012 position statement. In light of the NAEYC/Fred Rogers Center position statement, it is important to know how participation in professional development and training impacts educators' access to and use of technology.

Current Report

The current report presents updated trends on early childhood educators' access to and use of technology as of January 2018. Given the proliferation of technology in just a few short years and the recent 6-year anniversary of the NAEYC/Fred Rogers Center position statement, we also offer information on the statement's reach and implementation in the field.

Survey Sample and Methodology

Procedure

The 2018 survey was based on the previous surveys conducted by the Center on Media and Human Development and the Fred Rogers Center (Blackwell et al., 2015; Wartella, Blackwell, Lauricella, & Robb, 2012), and was conducted to capture early childhood educators' access to and use of multiple technologies in their programs/classrooms. These technologies included traditional devices (e.g., TV/DVDs and computers) as well as newer mobile devices (e.g., smartphones and tablet computers). Survey questions solicited respondents' attitudes towards and confidence around using technology for pedagogical purposes. Other questions gauged the amount of educational technology professional development and support respondents received in their programs (see Appendix for complete survey).

We grouped respondents' reported program types into four mutually exclusive categories: school-based, center-based, Head Start, and home-based. School-based programs were defined as all pre-Kindergarten (pre-K) programs – both public and private – within a formal K-12 school system. Center-based care described for- or non-profit organizations (excluding Head Start) not associated with a formal K-12 school system, such as a YMCA, Montessori, or Bright Horizons. Head Start described federal Head Start and Early Head Start programs, and home-based care was defined as programs where providers cared for two or more children in their own home.

We also divided the sample into two groups: (1) educators and (2) administrators. Educators consisted of respondents who reported their job title as home-based child care provider, classroom/center teacher, classroom/center assistant teacher, and classroom/center aide. Administrators included center directors and assistant directors, school principals, specialists, coaches, librarians, and executive directors overseeing several center sites.

Throughout the report, we use whole percentages whenever possible and round up to two decimal places when it is not possible. Not all percentages add up to 100 due to rounding.

Respondents

We collected data through online surveys distributed to NAEYC members between December 2017 and January 2018. Nearly 750 participants started the survey, but some of these responses were incomplete (i.e., did not answer all questions) while others represented respondents outside the target participant group, such as university faculty and teacher educators. The final dataset discussed here represents complete data from center administrators and educators exclusively working with children birth to 8 (e.g., classroom/center teachers, home-based care providers). We note the sample size of responses for each question.

2018 Total Respondents

A total of 488 participants serving children 0 to 8 years old provided complete survey data. Educators working directly with young children represented 56.1% of the sample while administrators made up 43.9%. The majority of participants were female (97.5%) and Caucasian (81%), with 5% African American, 5% Hispanic/Latinx, 3% Asian, <1% Native American/Alaskan Native, <1% Hawaiian Native/Pacific Islander, and 4% mixed racial background. Participants were 48.21 years old, on average (SD = 11.23). Participants reported a median family income of \$71,000 to \$80,000, which is slightly higher than the national U.S. median household income of \$60,336 in 2017 (Guzman, 2018). With respect to educational attainment, 40% of participants had a 4-year college degree, 39% had a master's degree, and 4% had a PhD, EdD, or other professional degree. The remaining 17% had either an associate's degree (8%), some college (9%), or a high school degree (<1%).

Respondents reported an average of 19.21 years (SD = 9.23) in the teaching profession. Respondents currently work in a range of program types: 44% work in center-based care, 39% in school-based care, 9% in Head Start/Early Head Start programs, and 9% in home-based childcare (Figure 1). Participants reported working with students from varied socioeconomic statuses, with 14% working with predominately low-income students, 34% working with primarily middle-income students, and 52% working with mostly high-income students. Participants also worked in a range of communities: 45% in suburban areas, 36% in urban areas, and 19% in rural areas. The majority of participants primarily worked with children in the preschool age group (73%), while 19% worked primarily with infants and toddlers, and 4% worked primarily with kindergarten and early elementary aged children. Four percent of participants worked with multiple age groups and could not identify only one with whom they primarily worked. Overall, respondents to the current survey reflected similar demographic profiles to those in the 2012 and 2014 surveys.

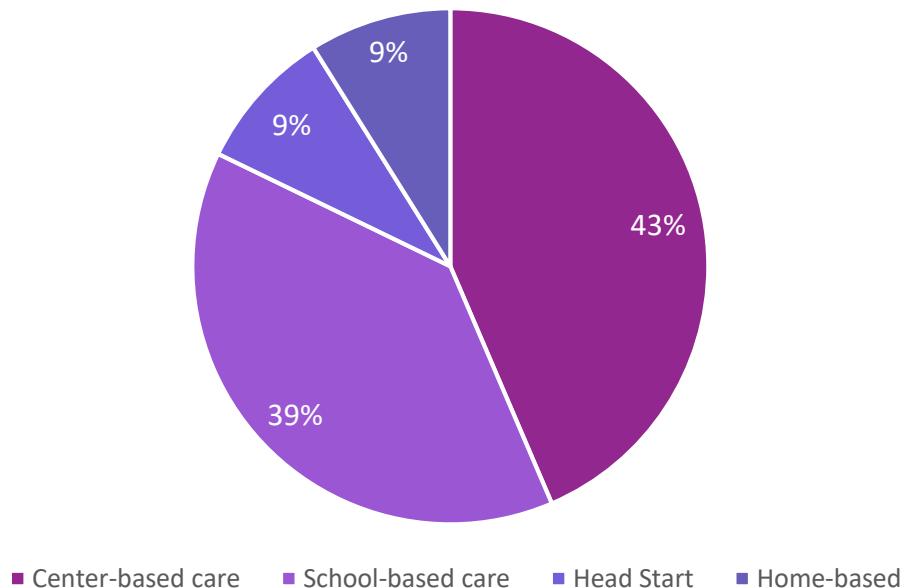


Figure 1. Percent of respondents by program type.

Findings

NAEYC/Fred Rogers Center Technology Statement

With respect to the 2012 joint position statement, 53% of respondents surveyed were at least somewhat familiar with it compared to 47% who were not at all familiar. Additionally, 76% of respondents agreed or strongly agreed with the following sentence taken directly from the statement:

“Technology and interactive media are tools that can promote effective learning and development when they are used intentionally by early childhood educators, within the framework of developmentally-appropriate practice, to support learning goals established for individual children” (p. 5).

More than half of respondents indicated that their school/program has specific policies about using technology for instructional purposes (58.5%), but the remaining respondents’ programs did not have policies (25.5%) or participants were not sure if policies existed (16%). Though most respondents noted that their programs have a policy (or policies), 72% claimed that their school/program does not have a specific curriculum to use technology for instructional purposes; alternatively, 12% mentioned their program does have a curriculum, while 16% were unsure.

Access

The majority of respondents reported having access to the Internet (89%), digital camera or video recorder (82%), a desktop or laptop computer (81%), tablets (71%), TV/DVDs (63%), and smartphones (61%) for instructional purposes (Figure 2). Fewer respondents reported having access to interactive whiteboards (30%) or e-readers (24%).

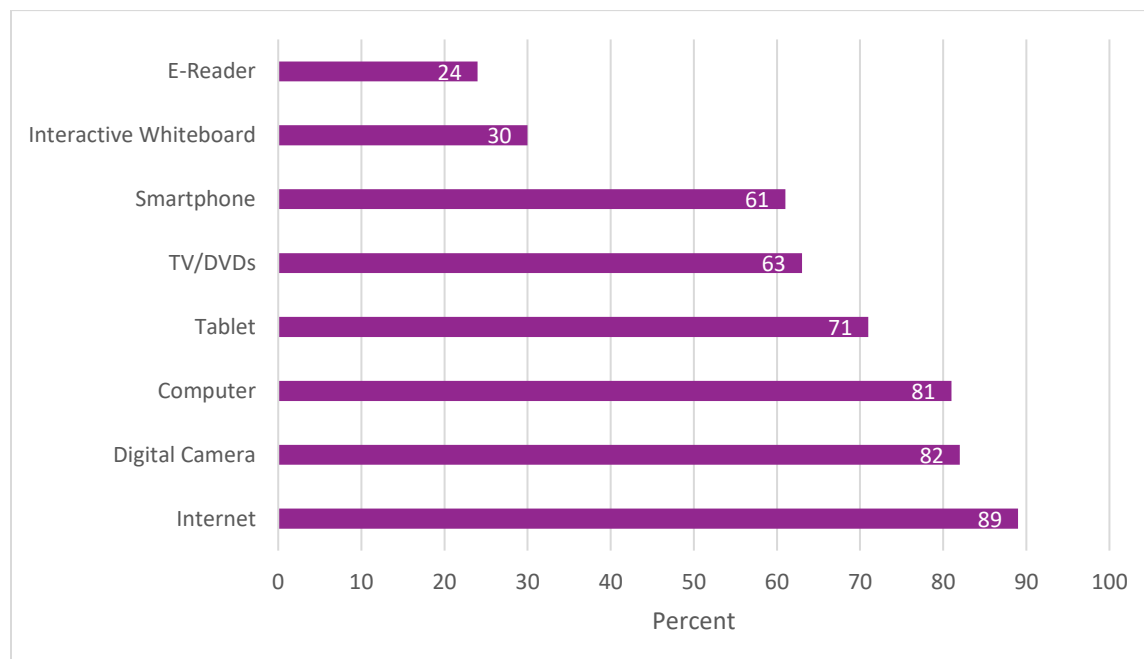


Figure 1. Percent of participants with access to each technology.

Access by Program Type

In general, center- and school-based programs had the most total access to technology compared to Head Start and home-based programs (Figure 3). Between programs, the main difference in access was the proportion of respondents with smartboards/interactive whiteboards ($\chi^2(3) = 46.94, p < 0.001$), where school-based programs had considerably more access compared to center-based programs (48% v. 16%). Additionally, center-, school-, and home-based care providers had more access to TV/DVDs ($\chi^2(3) = 23.92, p < 0.001$) and smartphones ($\chi^2(3) = 21.63, p < 0.001$) compared to Head Start providers.

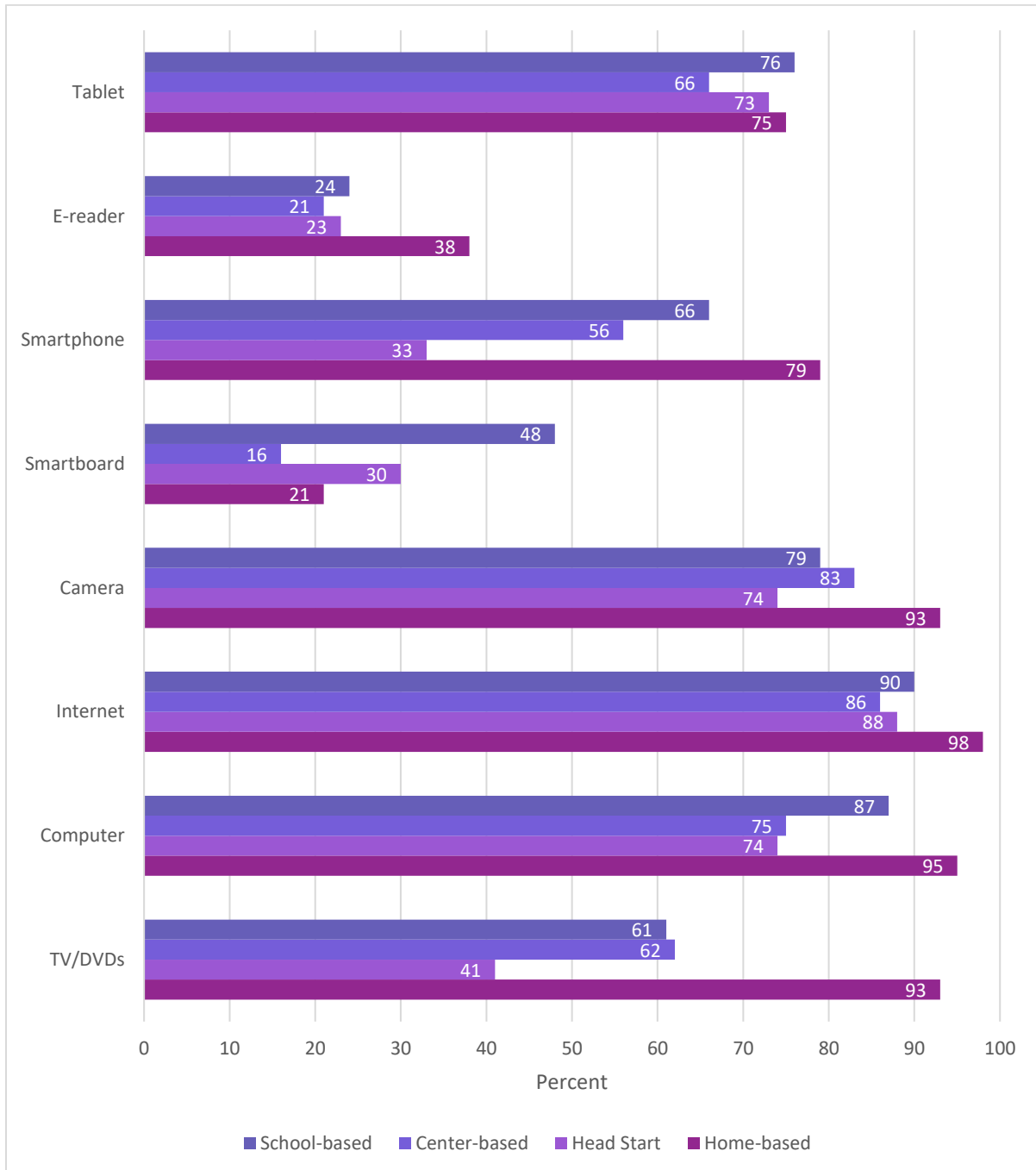


Figure 3. Percent of participants with access to each technology by program type.

Use

For those who have access, the respondents in our sample reported spending a large amount of time using digital cameras and tablets for instructional purposes – 76% and 68% use these two technologies at least once a month, respectively. Alternatively, 24% used the digital cameras less than once a month, while 32% used tablets less than once a month.

Interestingly, though most respondents do not have access to interactive whiteboards, those that do use them quite often, with 67% of respondents using them at least once a month. However, 33% said they use these devices less than once a month. Likewise, 61% of respondents surveyed use the internet at least once a month for instructional purposes while 39% use it less than once a month.

Other devices were used less frequently for instructional purposes. Only 52% of respondents reported using smartphones at least once a month for instructional purposes, and even fewer (48%) reported using computers at least once a month. Most with access to TV/DVDs (72%) use them less than once a month. E-readers were the least popular technology, with 75% of respondents using them less than once a month.

Use by Occupation Status

Figure 4 details differences in technology use by occupation status (educators v. administrators). Two main differences emerged. First, educators use TV/DVDs more often than administrators ($X^2(1) = 6.22, p < 0.05$). Second, though only trending towards statistical significance, educators use the internet more often compared to administrators ($X^2(1) = 2.75, p = 0.09$).

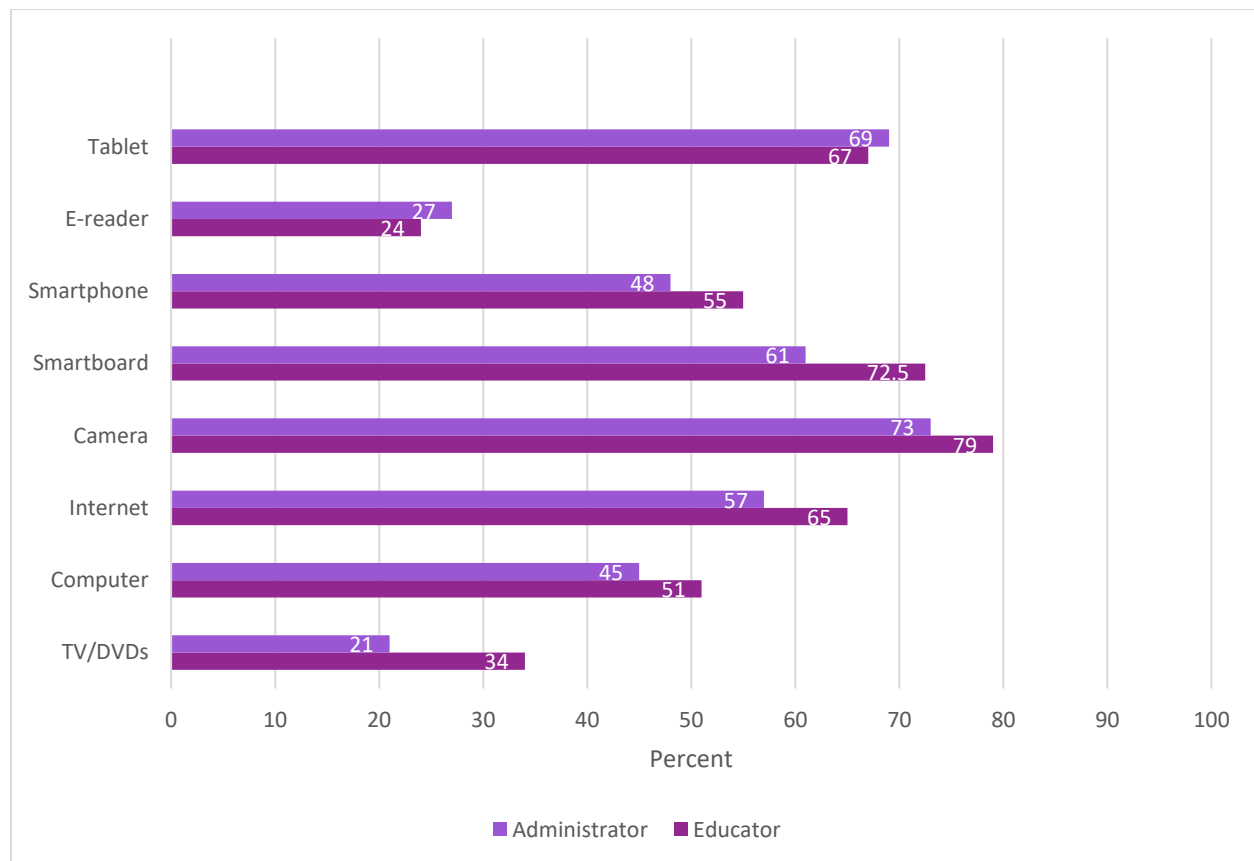


Figure 4. Percent of participants who use each technology at least once a month by occupation status.

Use by Program Type

Figure 5 detail differences in technology use by program type. Three statistically significant differences emerged. School-based programs use computers ($\chi^2(3) = 13.94, p < 0.01$), the internet ($\chi^2(3) = 14.59, p < 0.01$), and smartphones ($\chi^2(3) = 8.71, p < 0.01$) more frequently compared to other programs.

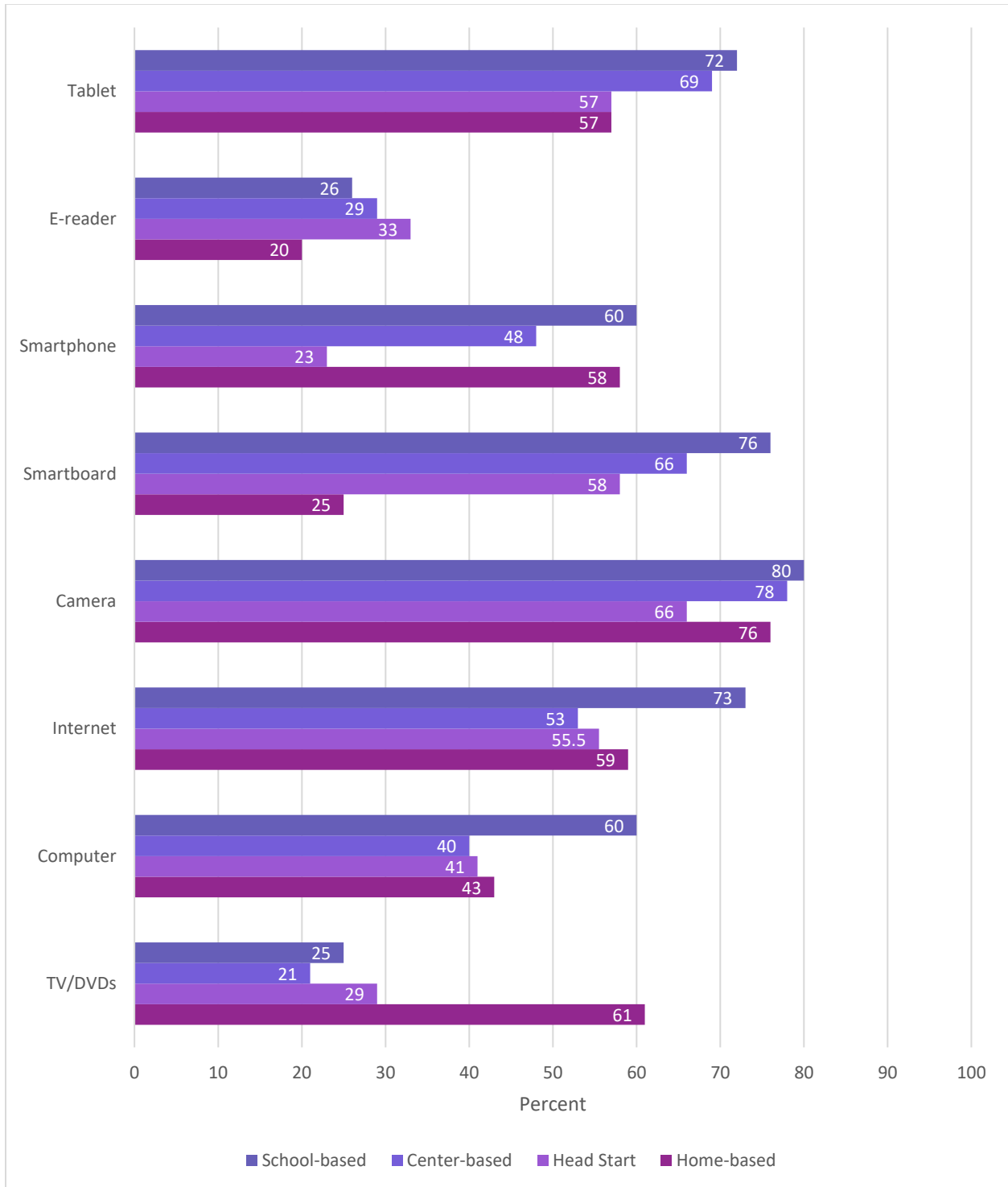


Figure 5. Percent of participants who use each technology at least once a month by program type.

Use by Child Age

Figure 6 details differences in technology use by primary age group served (e.g., infants and toddlers, preschoolers, or elementary students). Three statistically significant differences emerged. Those who work with early elementary students use computers ($\chi^2(2) = 26.73, p < 0.01$), the internet ($\chi^2(2) = 31.18, p < 0.01$), and smartphones ($\chi^2(2) = 10.19, p < 0.01$) more frequently compared to those who work primarily with other age groups.

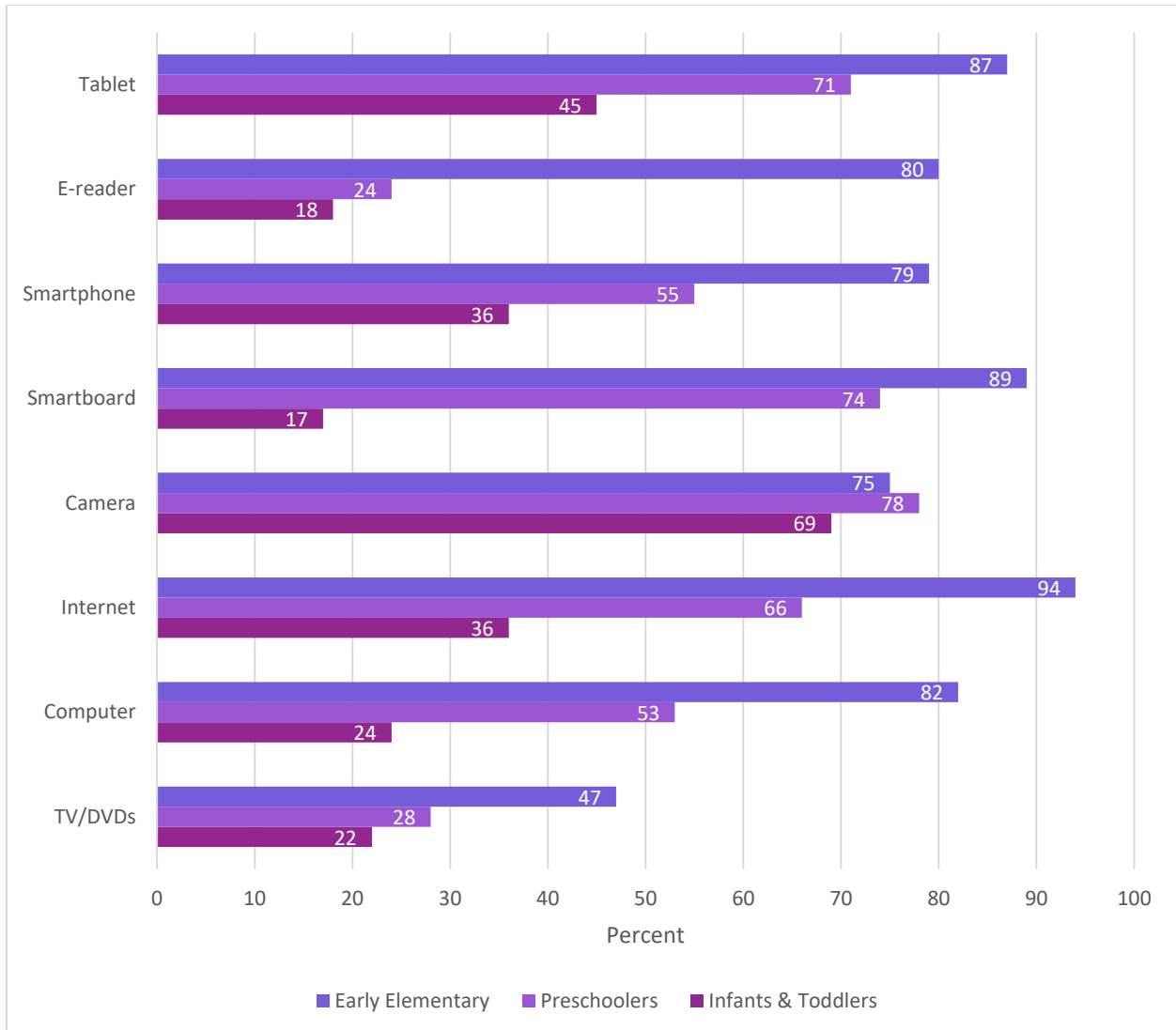


Figure 6. Percent of participants who use each technology at least once a month by primary age group served.

How Participants Use Computers

Participants with access to computers were asked how frequently (e.g., never, sometimes, often, always) they use the technology for specific purposes (e.g., documentation, children's learning of basic technology skills; Figure 6). In most cases, more than half of the respondents reported never using

computers for the specific purposes listed. The three exceptions were using a computer to play videos (62%), strengthening home-school connection (71%), and documenting children’s learning (78%) at least sometimes.

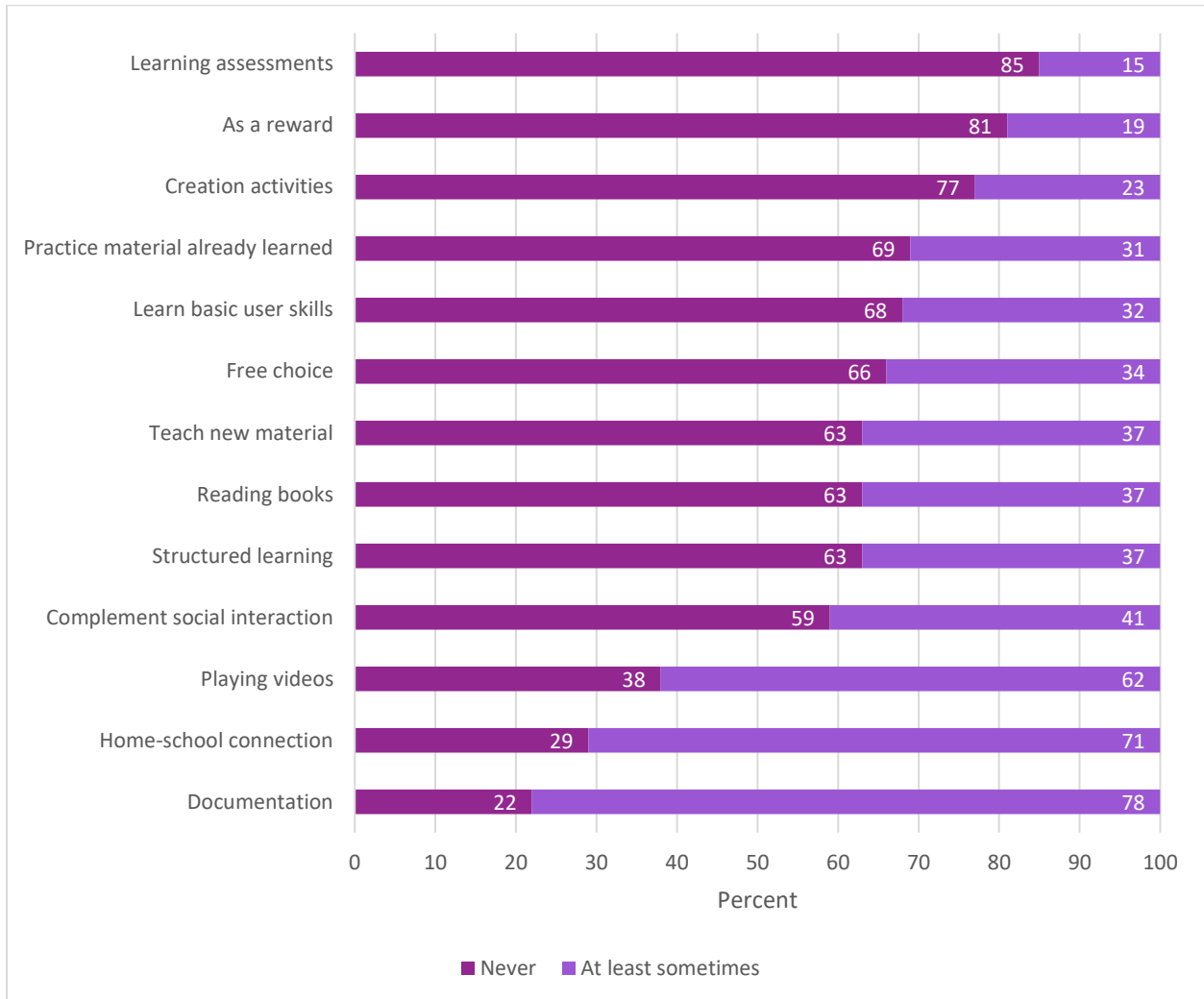


Figure 7. Percent of participants who never/at least sometimes use computers for specific pedagogical purposes.

How Participants Use Tablet Computers

Participants with access to tablet computers were asked how frequently (e.g., never, sometimes, often, always) they use the technology for specific purposes (e.g., as a reward, creation activities; Figure 7). In most cases, more than half of the respondents reported never using tablet computers for the specific purpose listed. As with computers, the only exceptions were using tablets at least sometimes to document children’s learning (66%), play videos (63%), and strengthen home-school connection (53%).

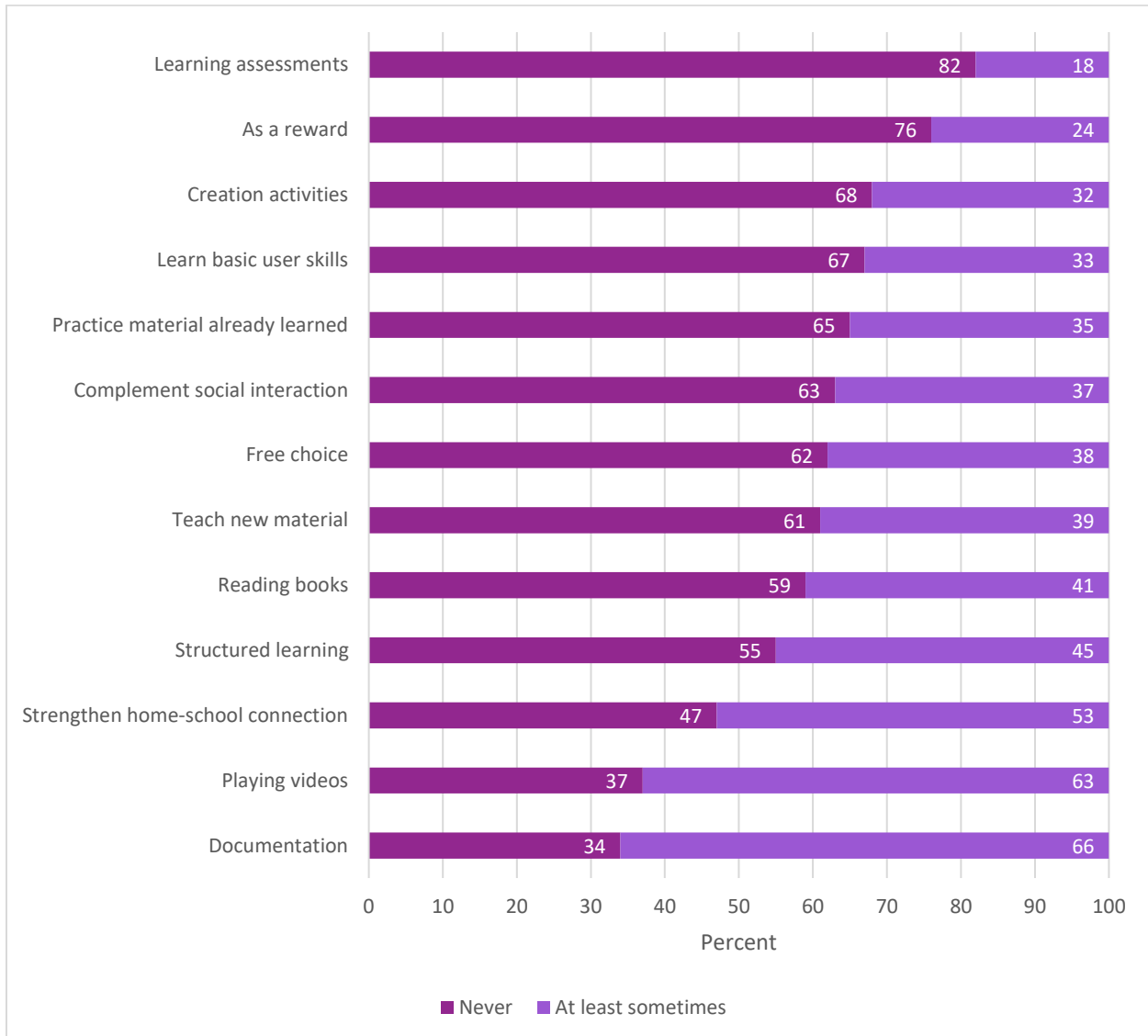


Figure 8. Percent of participants who never/at least sometimes use tablet computers for specific pedagogical purposes.

Age-Appropriateness of Technology by Occupation Status

In terms of specific technologies, educators reported that TV/DVDs should be introduced when children are 2.62 years old (SD = 2.28), computers when they are 3.53 years old (SD = 1.91), and tablet computers when they are 3.32 years old (SD = 1.88). Alternatively, some educators said TV/DVDs (20%), computers (9%), and/or tablet computers (12%) are never appropriate in early childhood education.

Compared to educators, administrators generally reported that technology should be introduced at earlier ages. Administrators reported that TV/DVDs should be introduced when children are 2.22 years old (SD = 2.54), computers when they are 3.36 years old (SD = 2.13), and tablet computers when they are 3.17 years old (SD = 2.10). None of these differences were statistically significant; however, the difference between educators and administrators for age-appropriateness of TV/DVDs trended towards significance ($t_{428} = 1.76, p = 0.08$). Interestingly, a larger proportion of administrators compared to educators said TV/DVDs (31%), computers (13%), and/or tablet computers (15%) are never appropriate in early childhood education.

Professional Development & Support

In terms of professional development, 51% of respondents reported receiving pre- or in-service training specifically in educational technology. There was no difference between educators and administrators in whether they received such training ($\chi^2(1) = 2.10, p = 0.15$). Further, while 16% of respondents mentioned that their school/program never offered any in-service professional development on technology, 51% reported having such professional development at least once a year; the remaining 34% received this training less than once a year.

Respondents did differ in how supportive they thought program leaders were in terms of educational technology support (see Figure 9). Many felt that they had support in using technology to communicate with parents or caregivers (58%) and general technical support (57%). However, respondents felt less supported in finding/navigating digital media resources and content (31%) as well as making technology relevant to different subject areas (29%).

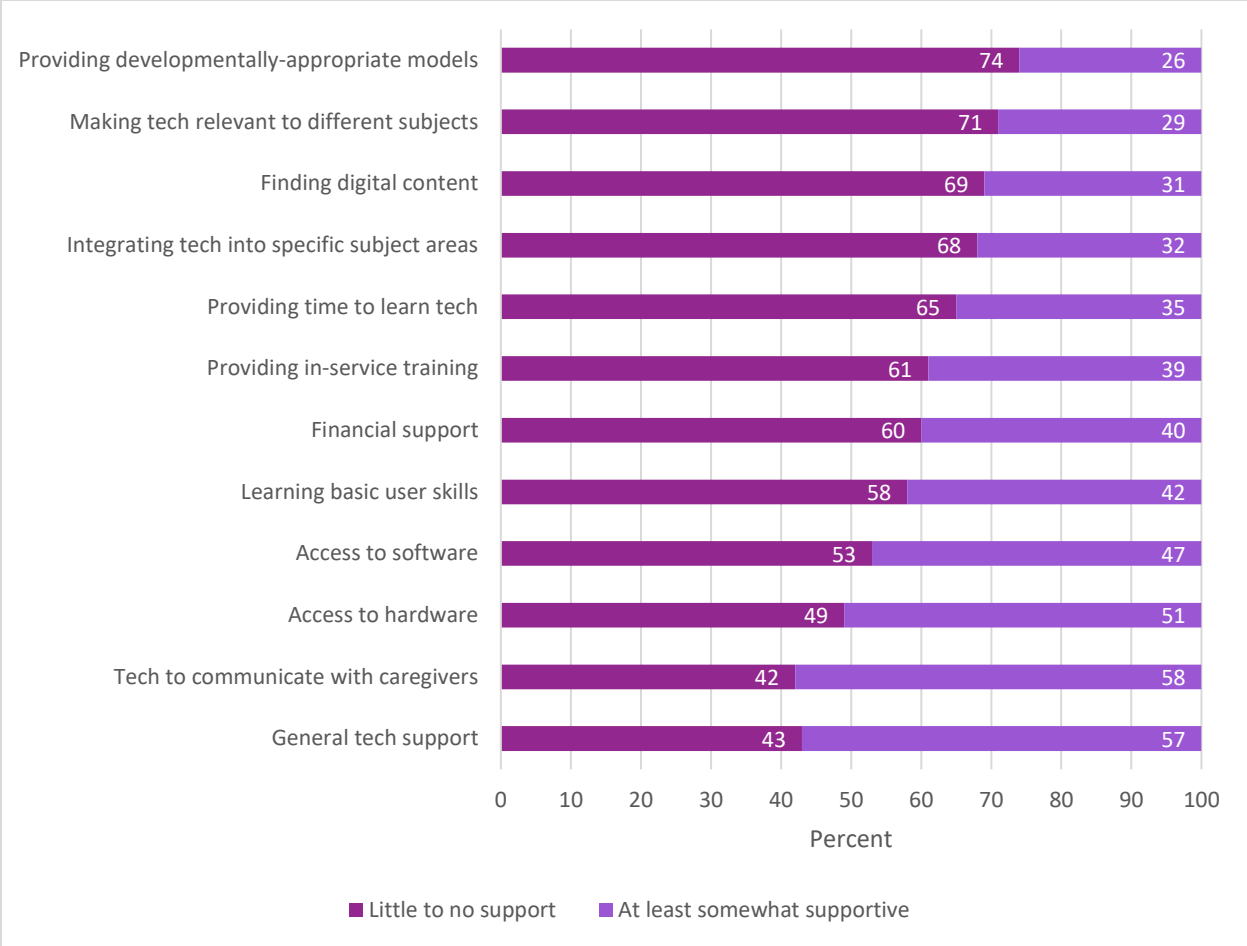


Figure 9. Percent of participants with little to no support/at least somewhat supportive leadership for educational technology.

In terms of perceived educational technology support, administrators, on the whole, noted that they felt the leadership at their school was generally at least somewhat supportive. Administrators significantly differed from educators in this way. Figure 10 denotes the percent of perceived support (at least somewhat supportive) for educators and administrators. The most notable statistically significant differences ($p < 0.05$) between educators and administrators are on responses to support for “using technology to communicate with parents and caregivers” and general “technical support.”

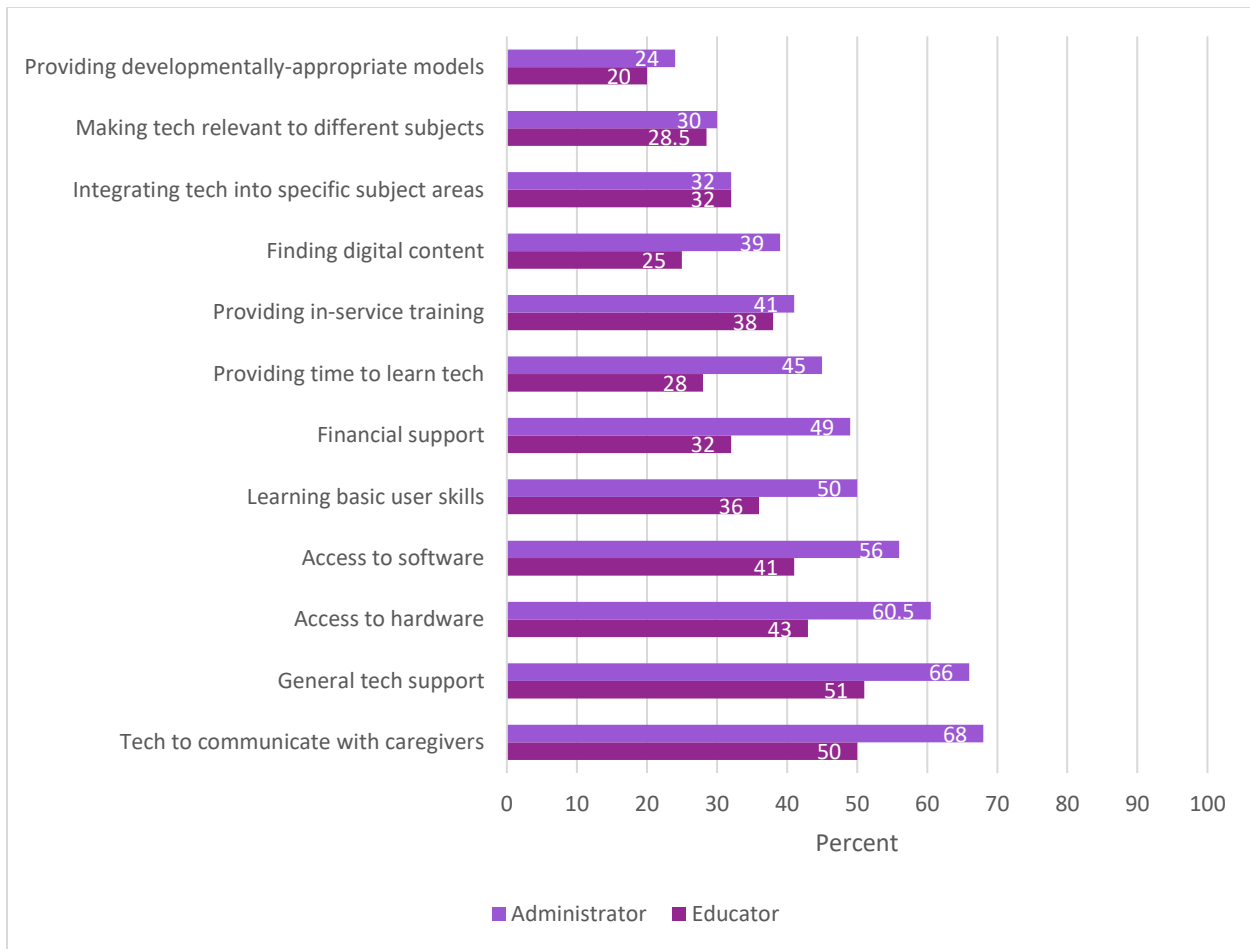


Figure 10. Percent of participants who perceived they had at least somewhat supportive leaders for educational technology by occupation status.

Attitudes Towards Technology

Respondents were asked about their attitude towards the use of technology in early childhood education. For example, they reported their level of agreement towards the value of technology for assisting children with disabilities, adapting curricula for individual student needs, and engaging parents in their children’s education (see Figure 11). In most cases, the majority of respondents were favorable or neutral towards technology for the situations listed, with two notable exceptions. Slightly more than half (52%) of respondents *disagreed* with the statement, “Technology is useful for social interactions among children,” while a third (33%) disagreed with the statement, “Technology tools should be used as part of everyday practice.”

Compared to educators, administrators had significantly less favorable opinions of technology as useful for improving individualized learning ($\chi^2(2) = 13.07, p < 0.05$), developing children’s critical thinking skills ($\chi^2(2) = 6.09, p < 0.05$) and social interactions among children ($\chi^2(2) = 9.21, p < 0.05$). Further, more administrators disagreed that technology tools should be used as part of everyday practice ($\chi^2(2) = 8.60, p < 0.05$).

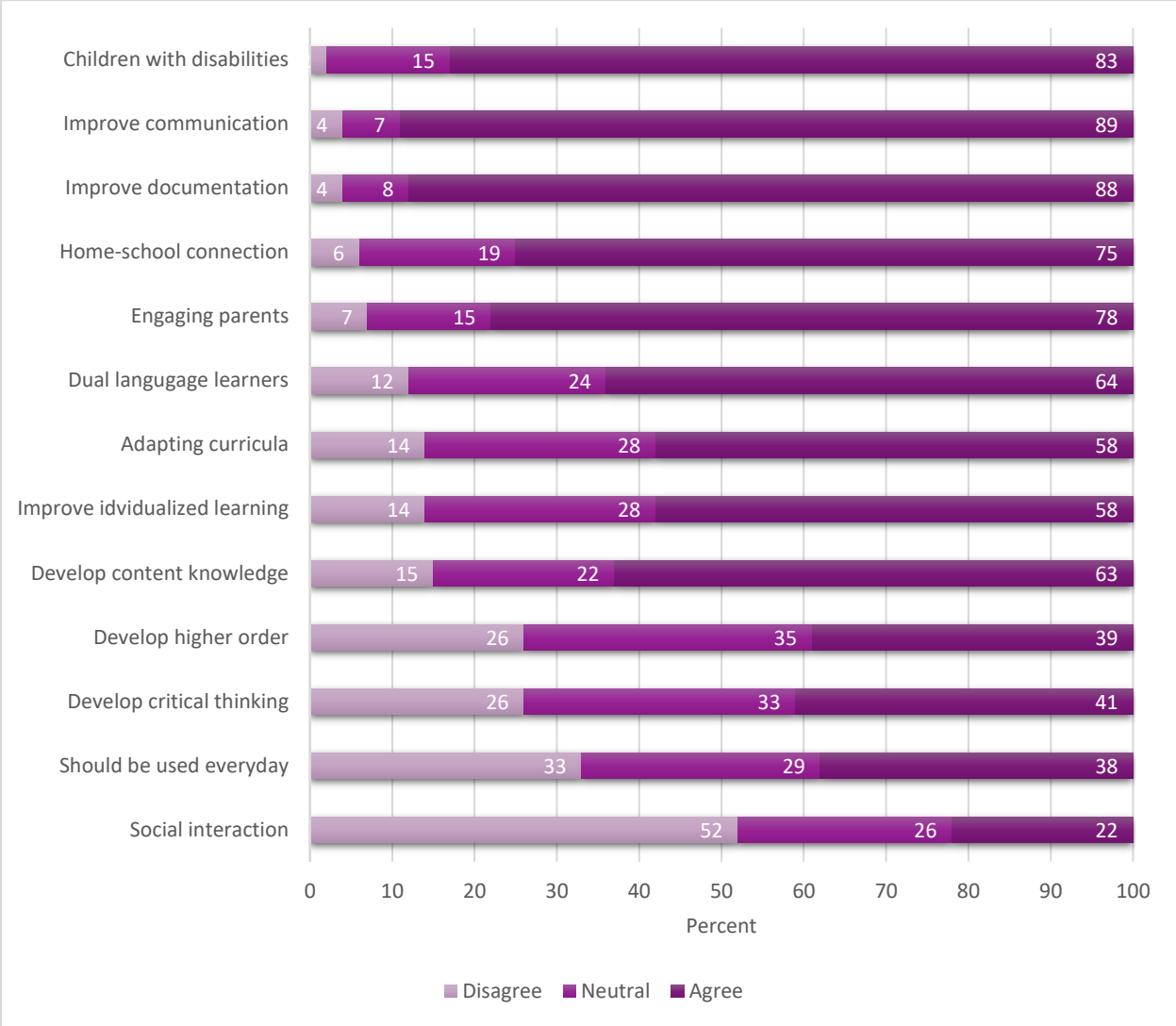


Figure 11. Percent of participants who disagree/are neutral/agree with the value of technology for children’s learning and pedagogical practices.

Respondents were also generally confident in their ability to use technology for instructional purposes in a developmentally-appropriate way. The majority reported being somewhat or very confident using every type of technology, and more than 80% had high confidence in using computers, the internet, digital cameras, and tablet computers in developmentally-appropriate ways (Figure 12). There were no significant differences between educators and administrators in terms of confidence in using specific technologies for instructional purposes in developmentally-appropriate ways.

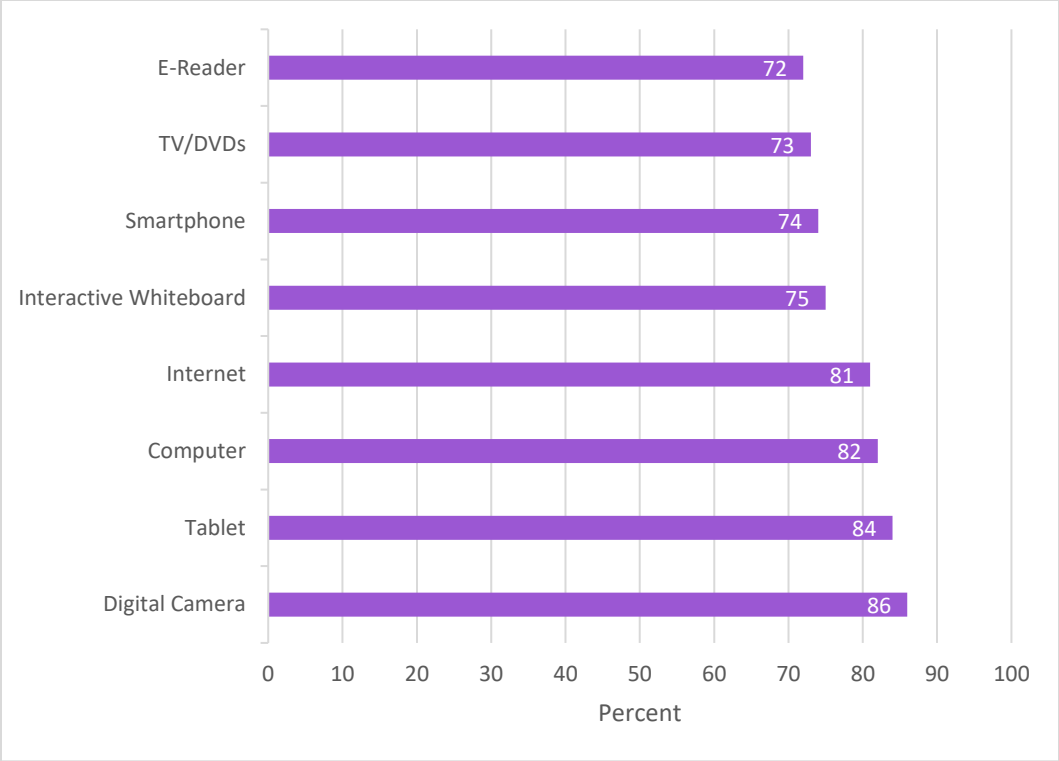


Figure 12. Percent of participants who are somewhat or very confident in using each technology in developmentally-appropriate ways.

Discussion

Overall, these findings exemplify the current landscape of media and technology in today's early childhood education environment nearly six years after the 2012 NAEYC/Fred Rogers Center position statement. Although there was an almost two-fold increase in survey respondents that were at least somewhat familiar with the 2012 NAEYC/Fred Rogers Center position from 2012 to 2014, there was little difference in the percentage of 2018 respondents who were familiar (52% in 2014 vs. 53% in 2018). This finding suggests that while the majority of respondents know about it, there has not been much recent improvement in ensuring that all educators are aware of it.

The current report also demonstrates that early childhood educators and administrators largely have access to different technologies, but some are more popular than others. Traditional technologies like digital cameras and computers are still quite prevalent, but access to mobile technologies continues to increase. Indeed, access to tablets is up from the 2014 survey (71% from 55%). While other technologies such as interactive whiteboards and e-readers remain scarce, access still increased – 30% and 24% in 2018 compared to 26% and 20% in 2014, respectively. There were few differences between program types, suggesting equitable access across the early childhood landscape.

Despite high access rates for most technologies, there was variability in the frequency of using these technologies. The internet and digital cameras were used the most frequently, which reflects trends found in 2012 and 2014 (Blackwell et al., 2015; Wartella et al., 2012). Despite the increased proliferation of tablets, digital cameras in particular remain a mainstay in early childhood education classrooms/programs. Additionally, use did not differ considerably by program type. However, when asked whether they use computers and tablets for specific purposes, the large majority of respondents primarily reported using these technologies for documentation and playing videos. Such activities suggest that respondents consider these devices useful for classroom management and, in the case of videos, possible supplements for traditional TV/DVDs. Given the lower frequency of use for more innovative classroom practices, such findings suggest early childhood educators may not have appropriate training and support to effectively use the technology with young children.

The specific ways respondents integrate technology is likely related to program/school policies, support, and/or professional development opportunities around technology. Indeed, more than half of respondents mentioned having at least some professional development training specifically in educational technology, and 51% receive training at least once a year at their programs/schools. This finding is a slight improvement from earlier reports, when only 49% received any pre- or in-service educational technology professional development. However, there was variability in respondents' perceptions of program support. Though the majority felt their programs/schools offered sufficient general technology support, respondents largely did not feel supported in finding or integrating technology in developmentally-appropriate ways in their classrooms. Such findings reflect little improvement since 2014 and suggest the need for more targeted efforts to help guide educators in understanding how to more effectively use technology for instructional purposes.

Interestingly, even though they might perceive less support around technology, respondents reported a fairly high level of confidence in using technology in developmentally-appropriate ways. Similarly, their attitudes towards technology were generally favorable or neutral. Such findings align with those in 2014 and may represent a continued trend towards more realistic views of what technology can and cannot do in early childhood education. While respondents may practice with these technologies and feel

confident implementing them, they are generally finding them to be more useful in certain circumstances than others, and their attitudes reflect this new knowledge.

This report demonstrates that while most educators know about the NAEYC/Fred Rogers Center position statement, there is still quite a way to go until *all* educators and administrators are familiar with it. Even if more were familiar, it is clear that continued professional development and support is needed to ensure that technology is being used in developmentally-appropriate and intentional ways. As the technology itself advances and access increases, pre- and in-service programs must take care to ensure that practitioners receive quality information and experience in using technology in diverse and developmentally-appropriate ways as well as the support to thoughtfully integrate it in the classroom for maximum impact for the children they reach. What is next for technology and early childhood education? We will just have to wait and see.

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Courtney Blackwell, PhD, is a Research Assistant Professor in the Department of Medical Social Sciences at Northwestern University's Feinberg School of Medicine. As a developmental methodologist, she has expertise in survey development and scale validation, including child and parent proxy Person Reported Outcome measures as well as population health surveys. Her research focuses on young children's learning and positive health development, and the complex social environmental factors that contribute to such outcomes. Of particular interest is the developmental origins of well-being, including conceptualizing, identifying, and measuring early indicators of this construct, as well as ascertaining risk and promotive factors in the home and school environment. With a background in early childhood educational media and technology, she is interested in the role that digital and interactive media plays in young children's engagement in and approaches to learning, both of which are cornerstones for well-being. Dr. Blackwell earned her PhD at Northwestern University and her EdM at the Harvard Graduate School of Education.

Alexis Lauricella, PhD, is an Assistant Professor at Erikson Institute and Director of the Technology in Early Childhood Center at Erikson Institute. Her research focuses on children's learning from media, parents' and teachers' attitudes toward and use of media with young children, and the effects of food marketing on obesity and health. Recent publications include empirical research articles in *Journal of Applied Developmental Psychology*, *Journal of Broadcasting & Electronic Media*, *Journal of Children and Media*, *Computers & Education*, *Media Psychology*, *Merrill Palmer Quarterly* and reports for the Fred Rogers Center and Common Sense Media. Lauricella is also the founder of www.PlayLearnParent.com, a website that translates child-development research for parents. Lauricella earned her PhD in Developmental Psychology and her MPP from Georgetown University.

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from the ICA, the Distinguished Scholar Award from the National Communication Association and the Krieghbaum Under 40 Award from the Association for Education in Journalism and Mass Communication. Wartella earned her PhD at the University of Minnesota and in 2017, she received an Honorary Doctor of Humane Letters from St. Vincent College.

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Appendix: Tables

Table 1. Technology use by occupation status.

	Less than once a month		At least once a month	
	Educator	Admin	Educator	Admin
TV/DVDs*	66%	79%	34%	21%
Computer	49%	55%	51%	45%
Internet	35%	43%	65%	57%
Digital Camera	21%	27%	79%	73%
Interactive Whiteboard	27.5%	39%	72.5%	61%
Smartphone	45%	52%	55%	48%
E-reader	76%	73%	24%	27%
Tablet	33%	31%	67%	69%

* $p < 0.05$.

Table 2. Technology use by program type.

	Less than once a month				At least once a month			
	Home Based	Head Start	Center Based	School Based	Home Based	Head Start	Center Based	School Based
TV/DVDs	39%	71%	79%	75%	61%	29%	21%	25%
Computer**	57%	59%	60%	39%	43%	41%	40%	60%
Internet**	41%	44.5%	47%	27%	59%	55.5%	53%	73%
Digital Camera	24%	34%	22%	20%	76%	66%	78%	80%
Interactive Whiteboard	75%	42%	33%	24%	25%	58%	66%	76%
Smartphone**	42%	77%	52%	40%	58%	23%	48%	60%
E-reader	80%	67%	71%	74%	20%	33%	29%	26%
Tablet	43%	43%	31%	28%	57%	57%	69%	72%

** $p < 0.01$.

Table 3. Perceived support by occupation status.

	Little to no support		At least somewhat supportive	
	Educator	Admin	Educator	Admin
Integrating tech into specific subject areas	68	68	32	32
Learning basic* user skills	64	50	36	50
Providing time to learn tech*	72	55	28	45
Making tech relevant to different subjects	71.5	70	28.5	30
General tech support*	49	34	51	66
Financial support*	68	51	32	49
Access to software*	59	44	41	56
Access to hardware*	57	39.5	43	60.5
Providing in-service training	62	59	38	41
Providing developmentally-appropriate models*	80	66	20	24
Using tech to communicate with caregivers*	50	32	50	68
Finding digital content*	75	61	25	39

* $p < 0.05$.

Appendix: 2018 Survey

1. Which best describes your job title?
 - Home-based child care provider
 - Classroom/center teacher
 - Classroom/center assistant teacher
 - Classroom/center aide
 - Center director
 - School principal
 - Higher education faculty
 - Pre-service teacher
 - Other (please explain)
2. What is the age of the children you work with? Please select all that apply.
 - Infants
 - Toddlers
 - Preschoolers
 - Kindergarteners
 - Early elementary school children
 - Other (please explain)
3. If you work with children of more than one age group, please choose the one you work with the most. **Please only think of this age group when completing the survey.**
 - Infants
 - Toddlers
 - Preschoolers
 - Kindergarteners
 - Early elementary school children
 - Other (please explain)
4. What is the average age of the children you work with the most? Please select all that apply.
 - 0 to 11months, 30 days
 - 1 year olds
 - 2 year olds
 - 3 year olds
 - 4 year olds
 - 5 year olds
 - 6 year olds
 - 7 year olds
 - 8 year olds
 - Other (please explain)
5. Next, we would like to ask about your personal beliefs on teaching and learning. Please indicate how strongly you agree or disagree with each of the following statements.
1 (strongly disagree), 2 (disagree), 3 (neither agree nor disagree), 4 (agree), 5 (strongly agree)
 - My role as an educator is to facilitate children's own inquiry.
 - Children learn best by finding solutions to problems on their own.
 - Children should be allowed to think of solutions to practical problems themselves before an adult shows them how they are solved.
 - Thinking and reasoning processes are more important than specific curriculum content.

Next, we are going to ask you about your access to and use of technology in your early childhood classroom/program.

6. Please indicate how often you **use** the following technologies in your early childhood classroom/program for **instructional purposes**. “Instructional purposes” is defined by the teacher using technology with students to reinforce a curricular goal. Examples include using the Internet to view a YouTube video related to an in-class discussion, taking and sharing digital pictures, or using an iPad to create art.
- 0 (never – i.e. if you have access, but don’t use it), 1 (less than once a month), 2 (once a month), 3 (several times a month), 4 (once a week), 5 (3 to 4 times a week), 6 (daily), 7 (N/A, i.e. you do not have access)**
- TV/DVD player
 - Laptop or desktop computer
 - Internet
 - Digital camera or video recorder
 - SmartBoard or interactive whiteboard
 - Touchscreen smartphone (e.g., iPhone, Galaxy S8, Motorola Droid)
 - E-reader, such as a Kindle or Nook
 - Tablet computer, such as an iPad, iPad mini, Nexus, or Kindle
7. How confident are you at using the following technologies with children for **instructional purposes** in a **developmentally appropriate** way? By “developmentally appropriate,” we mean using technology that takes into account the age, interests, and abilities of each child as well as his/her developmental stage.
- 1 (not confident at all), 2 (not very confident), 3 (neutral), 4 (somewhat confident), 5 (very confident)**
- TV/DVD player
 - Laptop or desktop computer
 - Internet
 - Digital camera or video recorder
 - SmartBoard or interactive whiteboard
 - Touchscreen smartphone (e.g., iPhone, Galaxy S8, Motorola Droid)
 - E-reader, such as a Kindle or Nook
 - Tablet computer, such as an iPad, iPad mini, Nexus, or Kindle
8. Please indicate if you use technology to teach the following content/skills in your early childhood classroom/program. Please select all that apply. If you do not teach specific content/skills at all, please select N/A.
- 1 (I use technology to teach this skill), 0 (I do not teach this content/skill)**
- Communicating and speaking
 - Vocabulary
 - Phonological awareness
 - Print and alphabet knowledge
 - Reading comprehension
 - Text/narrative structure
 - Writing
 - Counting and cardinality
 - Operations and algebraic thinking
 - Measurement
 - Geometry
 - Spatial sense
 - Scientific inquiry
 - Reasoning and problem solving

- Earth science
 - Physical science
 - Life science
 - Computer science/coding
 - Art
 - Social and emotional learning
9. Of the computer programs that children in your classroom/program regularly use, please select up to three that they use **most often**.
10. How often do you use a **laptop/desktop computer** in the following ways?
0 (never), 1 (sometimes), 2 (often), 3 (always)
 To help children learn basic technology skills (e.g., typing)
 During free choice time, where children can choose any website/computer program to use
 For structured learning activities, where children only do a specific activity on the computer
 For children to read books
 For creation activities, such as having children draw and write/audio record what they draw
 For children to take learning assessments
 To practice material already learned
 To teach new material
 As a reward
 To expand children's learning experiences beyond the classroom (e.g., videos, virtual field trips)
 For documenting children's learning
 To complement social interactions between children and/or between children and adults
 To strengthen home-school connections
11. What proportion of your instructional practice with laptop/desktop computers is spent in the following student grouping strategies? All percentages must add up to 100%.
 Individual
 Pairs
 Small groups (3 or more children)
 Whole group
Total
12. Of the tablet computer apps that children in your classroom/program regularly use, please select up to three they use most often.
13. How often do **CHILDREN** in your classroom/program use the following features of tablet computers?
0 (never), 1 (rarely), 2 (sometimes), 3 (often)
 Photo camera
 Video camera
 Audio recorder
 Internet
14. How often do **YOU** use the following features of tablet computers for *instructional purposes*?
0 (never), 1 (rarely), 2 (sometimes), 3 (often)
 Photo camera
 Video camera
 Audio recorder
 Internet
15. How often do you use a **tablet computer** in the following ways?
0 (never), 1 (sometimes), 2 (often), 3 (always)
 To help children learn basic technology skills (e.g. typing)

- During free choice time, where children can choose any app to use
 - For structured learning activities, where children only do a specific activity on the tablet computer
 - For children to read books
 - For creation activities, such as having children draw and write/audio record what they draw
 - For children to take learning assessments
 - To practice material already learned
 - To teach new material
 - As a reward
 - For documenting children's learning
 - To expand children's learning experiences beyond the classroom (e.g., videos, virtual field trips)
 - To complete social interactions between children and/or between children and adults
 - To strengthen home-school connections
16. What proportion of your instructional practice with tablet computers is spent in the following child grouping strategies? All percentages must add up to 100%.
- Individual
 - Pairs
 - Small groups (3 or more children)
 - Whole group
 - Total**
17. How often do you engage in the following activities with parents and caregivers of children in your classroom/program?
- 0 (never), 1 (rarely), 2 (sometimes), 3 (often)**
- Face-to-face meetings
 - Call on the phone
 - Email
 - Text pictures of children or classroom activities
 - Communicate via Facebook or other social networks
 - Send flyers/updates home with children
18. What is the earliest age you think is appropriate to introduce children to **TV/DVDs** in an *early childhood classroom/program*?
19. What is the earliest age you think is appropriate to introduce children to **laptop or desktop computers** in an *early childhood classroom/program*?
20. What is the earliest age you think is appropriate to introduce children to **tablet computers** in an *early childhood classroom/program*?
21. Please indicate how much you agree or disagree with the statements with regard to using technology in early childhood education:
- 1 (strongly disagree), 2 (disagree), 3 (neither agree nor disagree), 4 (agree), 5 (strongly agree)**
- Technology can improve documentation of children's learning.
 - Technology can improve individualized learning.
 - Technology can improve my ability to communicate with parents and other caregivers.
 - Technology can help to develop children's critical thinking skills.
 - Technology can help to develop children's higher-order skills.
 - Technology can help to develop children's content knowledge.
 - Technology is useful for assisting children with disabilities.
 - Technology is useful for social interactions among children.
 - Technology is useful for adapting curricula to individual student needs.

Technology is useful for supporting dual language learners.
Technology is useful to engage parents in their children's education.
Technology tools should be used as part of every day practice.
Technology can strengthen home-school connections.

In this section, we ask questions about the pre-service and in-service professional development you receive(d), as well as current support for integrating educational technology into your early childhood classroom/program.

22. Have you ever received pre- or in-service professional development training specifically in educational technology? (y/n)
23. How often does your early childhood classroom/program offer any in-service professional development on technology?
- Never
 - Less than once a year
 - Once a year
 - Several times a year
 - Once a month
 - Two to three times a month
 - Weekly
24. Listed below are characteristics of **educational technology** support that your school/program may offer. For each item, please indicate how you would characterize the support you receive from leaders at your school/program.
- 0 (no support offered), 1 (very unsupportive), 2 (somewhat unsupportive), 3 (neither unsupportive nor supportive), 4 (somewhat supportive), 5 (very supportive)**
- Integrating technology into specific subject areas
 - Learning basic user skills (eg. word processing software, email, how to upload/download pictures/videos)
 - Providing sufficient time to learn how to use technology
 - Making technology relevant to different subject areas
 - Technical support
 - Financial support
 - Providing adequate software
 - Providing adequate hardware
 - Providing ongoing in-service training
 - Providing developmentally appropriate models for using technology with children
 - Using technology to communicate with parents and other caregivers
 - Helping you find and navigate available digital media resources and content (e.g., online videos, interactives, games, apps)

25. Does your school/program have specific policies about the use of technology for instructional purposes? (y/n/unsure)
26. Does your school/program have a specific technology curriculum about the use of technology for instructional purposes? (y/n/unsure)
27. When looking for digital resources, I most often go to:
- Website(s)
 - Colleague(s)
 - Librarian
 - Technology Specialist
 - Parents of children in my classroom/program
 - Other (please specify)
28. In March, 2012, the National Association for the Education of Young Children and the Fred Rogers Center for Early Learning and Children's Media at Saint Vincent College released a policy statement on the use of technology in early childhood education. How familiar are you with the statement?
- Not at all familiar
 - Somewhat familiar
 - Moderately familiar
 - Very familiar
29. How much do you agree or disagree with the following statement:
1 (strongly disagree), 2 (disagree), 3 (neither agree nor disagree), 4 (agree), 5 (strongly agree)

Technology and interactive media are tools that can promote effective learning and development when they are used intentionally by early childhood educators, within the framework of developmentally appropriate practice, to support learning goals established for individual children.

Next, we are interested in gathering some demographic information.

30. Are you Female _____? Male _____? Other _____?
31. What is your age?
32. What is your racial/ethnic background? Please select all that apply.
- White, non-Hispanic/Latino
 - Hispanic/Latino
 - African-American
 - Asian
 - Native American or Alaskan Native
 - Hawaiian Native or Other Pacific Islander
 - 2 or more races
33. What is your annual **family** income level?
- Less than \$10,000
 - \$10,000 to \$20,000
 - \$21,000 to \$30,000
 - \$31,000 to \$40,000
 - \$41,000 to \$50,000
 - \$51,000 to \$60,000
 - \$61,000 to \$70,000
 - \$71,000 to \$80,000
 - \$81,000 to \$90,000
 - \$91,000 to \$100,000
 - \$101,000 to \$ 110,000
 - \$111,000 to \$120,000
 - \$121,000 to \$130,000
 - \$131,000 to \$140,000
 - \$141,000 to \$150,000
 - More than \$150,000
34. What is your highest level of education?
- Some high school or less
 - High school graduate (diploma or GED certificate)
 - Some college, no degree
 - Associate's degree
 - Bachelor's degree
 - Some graduate schoolwork, no degree
 - Master's degree
 - PhD, EdD, or other professional degree (e.g., MD, JD)
35. How many years have you been in the teaching profession?
36. How many boys and girls are in your classroom/program?
- Number of boys _____
- Number of girls _____
37. How would you best describe the economic level of the children in your program? Please estimate the number of children in each of the following income groups:
- Low-income _____
- Middle-income _____

- High-income _____
38. How would you best describe the racial/ethnic makeup of the children in your classroom? Please estimate the number of children in each of the following racial/ethnic groups:
- White, non-Hispanic/Latino _____
- Hispanic/Latino _____
- African-American _____
- Asian _____
- Native American or Alaskan Native _____
- Hawaiian Native or Other Pacific Islander _____
- 2 or more races _____

The next set of questions ask about the type of early childhood setting in which your work.

39. Which best describes the type of program in which you work?
- Family child care (eg. care for children in your home)
- Early Head Start or Head Start Program
- Program by a for-profit or non-profit organization (e.g., organizations such as the local YMCA, Bright Horizons, United Way, a local child advocacy center, standalone Montessori preschool programs, etc.)
- Program within a public school
- Program within a private school
- I do not work in a child care program (please explain):
40. In what type of community is your program located?
- Urban
- Rural
- Suburban
41. What is the zipcode of your school?
42. Did you take a similar survey in 2014? (y/n)