Assistive Technology for Young Children – Effective yet Underutilized (or, is it un-documented?)

Considerations for making informed decisions about using assistive technology (AT) – an important discussion.

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Handout

Systematic Review of Studies Promoting the Use of Assistive Technology Devices by Young Children with Disabilities

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Tots N Tech Research Brief

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Abstract: Findings from a meta-analysis of studies investigating the use of five different assistive technology devices (switch interfaces, powered mobility, computers, augmentative communication, weighted/pressure vests) with young children with disabilities are reported. One hundred and nine studies including 1342 infants, toddlers, and preschoolers were the focus of analysis. Results showed that the use of all the assistive technology devices except weighted and pressure vests were related to improvements in child outcomes regardless of type of child disability or severity of child intellectual delay. The importance of the use of evidence-based training methods for promoting practitioners' and parents' use of assistive technology is described.

Introduction

Assistive technology includes devices that are used by individuals with disabilities, including infants, toddlers, and preschoolers, in order for them to participate in typically occurring everyday activities and to perform functions that otherwise would be difficult or impossible without the use of the technology (Judge & Parette, 1998; Mistrett, 2004). According to Campbell, Milbourne, Dugan, and Wilcox (2006), assistive technology includes both adaptations to readily available items (e.g., spoons, car seats) and the use of specialized devices (e.g., switch interfaces, power wheelchairs). The effectiveness of different types of adaptations on child behavior was the focus of another *Tots N Tech* research synthesis (Trivette, Dunst, Hamby, & O'Herin, 2010). The research synthesis in this present *Tots N Tech Research Brief* specifically examined the effectiveness of the use of specialized devices on changes or improvements in child behavior and outcomes.

More than a half dozen reviews and syntheses of studies investigating the use of assistive technology with young children with disabilities have been published (e.g., Campbell et al., 2006; Daniels, Sparling, Reilly, & Humphry, 1995; Dunst, Trivette, & Hamby, 2012; Floyd, Canter, Jeffs, & Judge, 2008; Mistrett et al., 2001). With only a single exception (Dunst et al., 2012), all the reviews have been narrative analyses of infants, toddlers, and preschoolers with disabilities use of different assistive technology devices. Several of these as well as other reviews have been criticized on methodological grounds where the review of assistive technology studies have concluded that the efficacy of the devices has yet to be established (e.g., Nicolson, Moir, & Millsteed, 2012; Ryan, 2012; Wendt, 2007). The conclusions of the investigators, however, were made without empirical analyses of whether methodological differences account for variations in study outcomes. This was one focus of investigation as part of the research synthesis described in this paper.

Background

The research synthesis described in this paper was a systematic review of studies of the use of assistive technology devices with young children with disabilities where the effectiveness of the devices was estimated using effect sizes as the metrics for ascertaining which types of devices with which children were associated with discernible changes or improvements in child outcomes (Dunst & Hamby, 2012). The research synthesis was both an update and extension of the Campbell et al. (2006) review of assistive technology studies. The types of devices that were the focus of investigation included: (1) Switch interface devices, (2) powered mobility devices, (3) computer devices, (4) augmentative communication devices, and (5) weighted and pressure vests. Table 1 includes descriptions of each of the devices which were used to categorize the different types of assistive technology for data analysis purposes. All of the devices except weighted or pressure vests were the focus of the Campbell et al. (2006) review. Weighted and pressure vests were investigated because of their recommended use with young children with disabilities (e.g., Judge & Parette, 1998).

Search Strategy

Search Terms

Studies were located using assistive technology* OR assist* technology* OR assist* n2 technology* OR assistive device OR adaptive equipment OR adapt* technology OR adapt* n2 technology* OR adaptive technology OR adaptive device* OR powered mobility OR powered device OR mobility aid OR switch interface OR contingency device OR adapt* switch OR adapt* toy OR computer interface* OR computer software OR computer access OR augmentative communicat* OR weighted vest OR pressure vest AND infant* OR infancy OR toddler OR preschool* AND disability* OR impair* OR handicap* OR disorder* as search terms.

Sources

PsychInfo, ERIC, MEDLINE, Rehabdata, Education Research Complete, Academic Search Premiere, CINAHL, ACM Digital Library, CIRRIE, and IEExplore were search for studies. These were supplemented by Google Scholar, Scirus, Ingenta Connect, and Google searches as well as a search of an EndNote library maintained by our Institute. Hand searches of the reference sections of existing literature reviews and all retrieved journal articles, book chapters, books, dissertations, and unpublished papers were made to locate additional studies.

Studies were included if the majority of children were six years of age or younger and had identified disabilities, the use of one of the five devices listed in Table 1 was the focus of investigation, and effect sizes for the relationships between the assistive technology devices and child outcomes could be computed from information in the research reports. Eight studies in the Campbell et al. (2006) review were excluded from the research synthesis because effect sizes could not be calculated or estimated from information in the primary research reports (Behrmann & Lahm, 1983; Butler, Okamato, & McKay, 1984; Butler, Okamoto, & McKay, 1983; Cook, Liu, & Hoseit, 1990; Hetzroni & Tannous, 2004; McCormick, 1987; Meehan, Mineo, & Lyon, 1985; O'Connor & Schery, 1986).

Search Results

One hundred and nine studies were located that met the inclusion criteria. The complete list of studies is included in the reference section of the *Research Brief*.

The studies included 1342 children 3 to 105 months of age (Mean = 45). Sixty-five percent of the children were male and 35% were female. The largest majority of the children had identified disabilities while some had non-specified developmental disabilities or delays. The identified conditions of the children included pervasive developmental disorders (e.g., Autism), chromosomal aberrations (e.g., Down syndrome), physical disabilities (e.g., Cerebral palsy), spinal cord aberrations (e.g., Spina bifida), speech and language disabilities (e.g., phonological processing disability), sensory disabilities (visual or hearing impairments), non-specified developmental disabilities, and multiple disabilities (any combination of two or more of the above or other conditions). Information in each of the primary studies was used to code the children’s severity of intellectual delay as severe/profound, mild/moderate, developmentally delayed (with identified disabilities), or at-risk for poor outcomes because of identified disabilities but without any intellectual delay at the time that the primary studies were conducted.

Forty-two of the studies employed some type of group research designs and 67 studies used some type of single participant research designs. Three types of group design studies were used: one-group pretest-post test, one-group between conditions (e.g., contingent vs. noncontingent arm movements), or two between group intervention vs. nonintervention experimental or quasi-experimental designs. Four types of single participant designs were used: AB baseline-intervention or pretest-post designs, ABA (ABAB, ABACAB, etc.) designs, multiple baseline designs, or alternating treatment designs. The group design studies included 1211 child participants and the single participant design studies included 131 child participants. The assistive technology devices that were the focus of investigation were categorized using the descriptions of the types of devices included in Table 1. Forty-three studies were investigations of computer devices, 31 were investigations of switch interface devices, 22 were investigations of augmentative communication devices, 10 were investigations of powered mobility devices, and 7 were investigations of weighted or pressure vests.

The outcome measures in the studies included *in vivo* assessments of child behavior while using the assistive technology devices or changes or improvements on independently administered scales or instruments (e.g., Dunn & Dunn, 1997; Haley, Coster, Ludlow, Haltiwanger, & Andrellos, 1992; Newborg, 2005). The outcomes were categorized as follows for purposes of data analysis: Cognitive, social, communication (including language), literacy (e.g., reading), motor, adaptive, and behavior engagement.

Cohen's *d* effect sizes were used to estimate the influences of the use of the assistive technology devices on the child outcomes. The comparative conditions that were used to evaluate the effects of the technology devices on the child outcomes are shown in Appendix B. The average effect sizes and 95% confidence intervals for the averages were used for substantive interpretation of the synthesis results. The effect sizes for the group design studies were the weighted averages taking into consideration differences in the study sample sizes where more weight was given to results in studies with larger sample sizes. The effect sizes for the single participant design studies were the unweighted averages since all the analyses were for N = 1 study participant. The *Z*-test was used to estimate the strength of the relationships between the independent and dependent variables.

Synthesis Findings

Findings from the research synthesis described in this *Tot N Tech Research Brief* indicated that except for weighted or pressure vests, the use of switch interface devices, powered mobility devices, computer devices, and augmentative communication devices with infants, toddlers, and preschoolers with developmental disabilities was associated with changes and improvements in the children's cognitive, social, communication, literacy, adaptive, and motor behavior and development as well as increases in child behavior engagement in different types of learning activities. The influences of the use of assistive technology devices on the child outcomes were manifested for children with different identified disabilities and different severities of intellectual delays. Moreover, the sizes of effects between the use of the devices and changes and improvements in child behavior and development were all medium to very large regardless of the type of research design used by the primary study investigators.

The average effect sizes, confidence intervals, and *Z*-test results for the relationships between the use of the five types of assistive technology devices and the child outcomes for the group and single participant design studies separately are included in Table 2. All the assistive technology devices were associated with changes or improvements in the child outcomes except for weighted or pressure vests. The sizes of effects for the switch interface devices, computer devices, and augmentative communication devices were all large or very large and ranged between d = 1.03 and d = 1.77 in the group design studies, and ranged between d = 1.63 and d = 2.71 in the single participant design studies. The sizes of effect for powered mobility devices were medium for the group design studies (d = .49) and the single participant design studies was larger (d = 1.20). Studies of weighted or pressure vests were excluded from all further analyses since they were not found to be effective devices.

The influences of the assistive technology devices on the different child outcomes for all studies combined are shown in Table 3. The use of the devices was associated with observed changes or improvements in all seven child outcome domains. The average effect sizes were all large or very large except for the child social behavior outcome measures which was nonetheless statistically significant at the p = .0000 level. In all the analyses, the children's use of assistive technology was associated with positive child outcomes.

To be assured that the sizes of effect for the use of the assistive technology devices on the child outcomes were not influenced by combining the data for the group and single participant design studies, we performed the same analyses for the two groups of investigations for outcomes that were examined in at least three studies and for which there were at least three effect sizes.

The average effect sizes for the group design studies ranged between $d = .64$ for child social development and engagement and $d = 1.40$ for child literacy development, $Z_s = 4.39$ to 19.51, $p_s =$ .0000. The average effect sizes for single participant design studies ranged between $d = .64$ for child social development and $d = 2.30$ for child communication development, $Z_s = 2.78$ to 22.09, p_s = .0054 to .0000. In both sets of analyses, use of the assistive technology devices was associated with better outcomes in all areas of child functioning.

Assistive Technology for Children at Different Ages

Figure 1 shows the effectiveness of the use of the assistive technology devices for children at different ages. The results showed, regardless of child age, that the use of the devices was associated with improvements or changes in the child outcomes. The average effect sizes ranged between $d = .92$ (55-72 months) and $d = 1.32$ (19-36 months) in the group design studies and ranged between $d = 1.24$ (19-36 months) and $d =$ 2.48 (55-72 months) in the single participant design studies. All of the effect sizes were large or very large in all eight sets of analyses.

Assistive Technology for Children with Different Disabilities

Table 4 shows the relationships between the use of assistive technology for children with different disabilities and the study outcomes. The average effect sizes were medium to very large for the children in the group design studies except for children with speech and language disorders and were very large for the children in the single participant design studies except for children with vision or hearing disabilities. In all of the analyses except for the five children with sensory disabilities in the single participant design studies, the average effect sizes were significant at the $p =$ .0001 to .0000 levels. The results, taken together, showed that the use of the assistive technology devices was effective in terms of changes or improvements in the child outcomes for almost all the children.

Assistive Technology for Children with an Intellectual Delay

The extent to which the effectiveness of the use of the assistive technology differed as a function of severity of child intellectual delay is shown in Figure 2 for the group design studies and in Figure 3 for the single participant design studies. The average effect sizes for the group design studies ranged between $d = .60$ for the children with severe delays to those at-risk for developmental delays, $Z = 3.53$, $p = .0004$, and $d =$ 1.15 for the children with severe and profound delays, $Z = 8.39$, $p = .0000$. The average effect sizes for the single participant design studies ranged between $d = .95$ for the children who were at-risk for developmental delays, $Z = 4.86$, $p = .0000$, and $d = 2.26$ for the children with mild and moderate delays, $Z = 11.73$, $p = .0000$. The results, taken together, indicate that the use of the devices was effective for children with any degree of intellectual delay and was especially effective for children demonstrating the most pronounced delays.

Assistive Technology & Child Outcomes for Various Research Designs

Table 5 shows the sizes of effects for the relationships between the use of the assistive technology devices and the child outcomes for the different types of research designs used in the primary research studies. All of the average effect sizes except for the one-group between-conditions comparison studies were large or very large, whereas average effect size for the one-group between-conditions group design studies was medium but nonetheless statistically significant at the $p = .0000$ level. The results showed that regardless of the research design used by the primary study investigators, use of the assistive technology devices were associated with improvements or changes in the child outcomes.

Discussion

The findings indicate that the use of assistive technology devices with young children with disabilities is warranted, and that available evidence indicates that the devices are likely to promote child engagement in typically occurring learning activities and permit children to perform functions that otherwise might prove difficult or even impossible without the use of the devices (Campbell et al., 2006; Mistrett, 2004). Disaggregation of the results showed that the sizes of effects between the use of the devices and the child outcomes were maintained regardless of any of the moderator variables bolstering the contention that the assistive technology devices were effective.

Establishing the effectiveness of assistive technology devices, however, is no guarantee that they will be routinely used by either practitioners or parents with young children with disabilities (Wessels, Dijcks, Soede, Gelderblom, & De Witte, 2003). A number of different factors have been identified for nonuse or abandonment of assistive technology (e.g., Copley & Ziviani, 2004; Hider, 2000; Lahm & Sizemore, 2002; Moore & Wilcox, 2006). One of these is the failure to use evidence-based training methods to promote practitioners' and parents' understanding of and skills in using different types of assistive technology devices. Failure to use certain training-related practices was associated with nonuse of assistive technology devices that were the focus of training (Dunst & Trivette, 2011). The extent to which training-related practices for six different adult learning characteristics (Dunst, Trivette, & Hamby, 2010) were incorporated into training opportunities to promote practitioners' or parents' use of assistive technology and adaptations with young children with disabilities were examined. Findings showed that large numbers of investigators failed to use evidence-based training procedures. This included a failure of a trainer to adequately demonstrate the use of the devices, insufficient practitioner and parent opportunities to use the devices and receive trainer feedback, and trainer-facilitated practitioner and parent reflection on and self-assessment of their mastery of use of the assistive technology. In contrast, practitioners' and parents' adoption and use of assistive technology was more likely to be demonstrated when at least 4 of the 6 evidence-based practices were explicitly used as part of training afforded end-users.

Recent advances in implementation sciences research and practice indicate that as much attention needs to be paid to the methods and procedures used by trainers, coaches, and other implementation agents as to the methods and procedures used by intervention agents (e.g., practitioners and parents) if intervention practices (e.g., assistive technology) are to be adopted and used as intended to influence changes or improvements in child outcomes (Dunst, 2012). Future research on promoting the use of assistive technology with young children with disabilities would therefore benefit from explicit attention being paid to the differences between implementation and intervention practices, and how the two are conceptually and procedurally related and in turn would be expected to influence outcomes of interest (Dunst & Trivette, 2012).

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(The studies in the research synthesis are indicated by asterisks)

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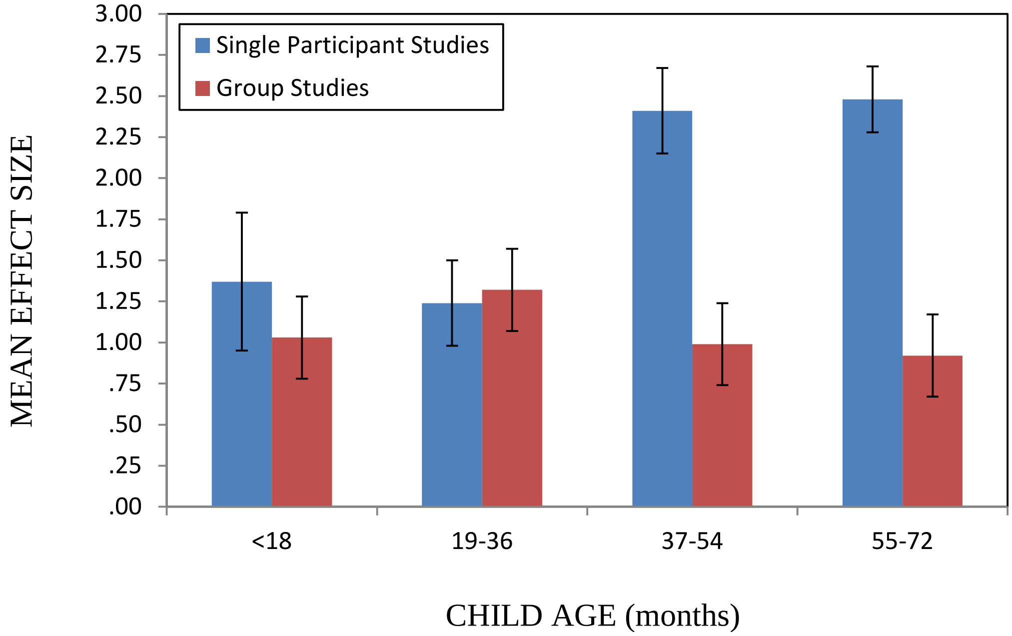

Figure 1. Average effect sizes and 95% confidence intervals for the relationships between the use of the assistive technology devices and the study outcomes at different child ages.

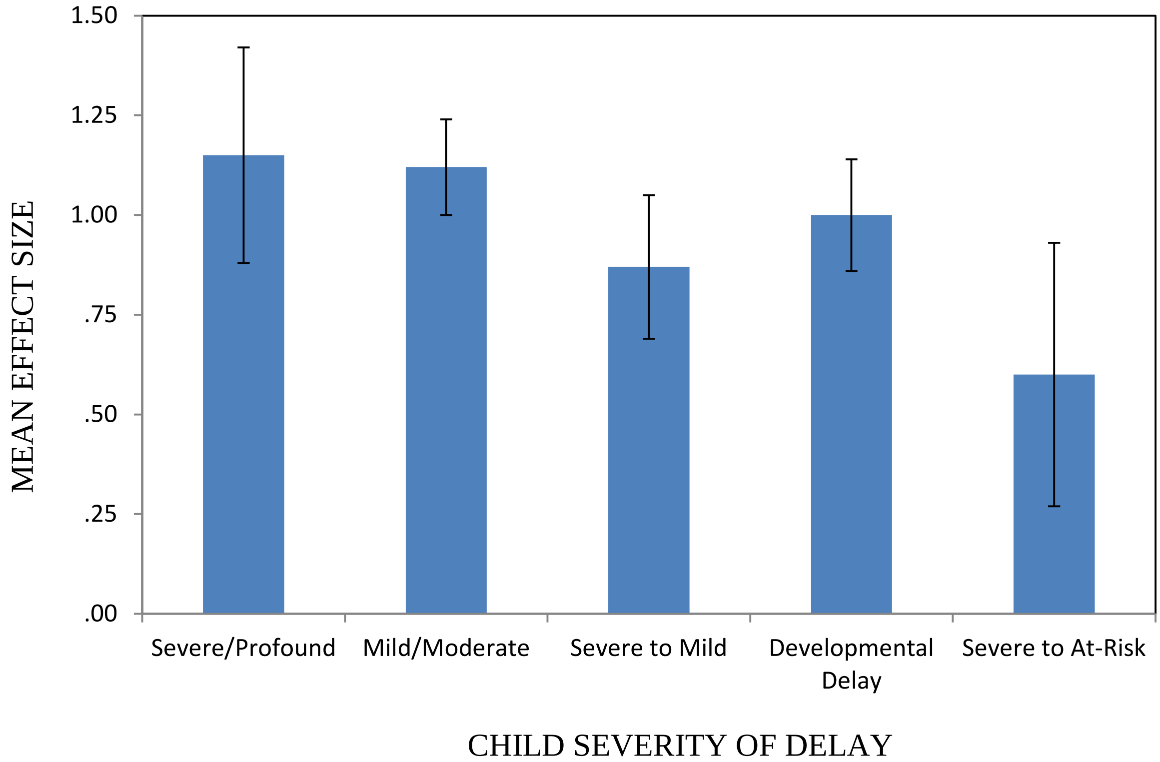

Figure 2. Average effect sizes and 95% confidence intervals for the relationship between the assistive technology and the child outcomes for different levels of child severity of delay in the group design studies.

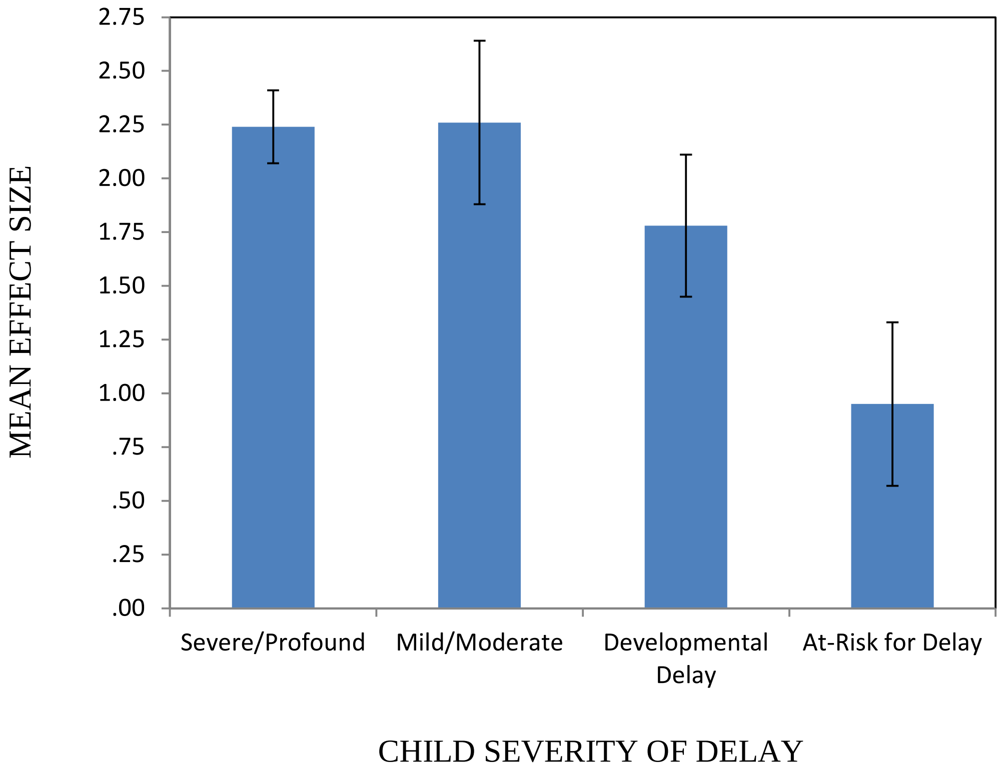

Figure 3. Average effect sizes and 95% confidence intervals for the relationship between the assistive technology and the child outcomes for different levels of child severity of delay in the single participant design studies.

Table 1

Descriptions of the Five Types of Assistive Technology Devices That Were the Focus of the Research Synthesis

Type of Device	Description
Switch Interface	Use of electromechanical or mechanical switches to allow a child to activate or deactivate a connection between a child's actions and a toy or object to produce an interesting or reinforcing effect.
Powered Mobility	Use of a battery operated wheelchair, riding toy or other type of mobility device that allows a child to move about as independently as possible.
Computer	Use of adapted or non-adapted keyboards, touch screens, a modified mouse and/or computer software that enables children to use a computer for play or learning.
Augmentative Communication	Electronic or non-electronic devices that permit a child to communicate without the use of speech.
Weighted/Pressure Vests	Use of a weighted or pressure vest to provide a child sensory input and to alleviate inattentiveness or stereotypic behavior and to increase child engagement.

Table 2

Average Effect Sizes, 95% Confidence Intervals (CI), and the Z-Test Results for the Relationships Between the Use of the Assistive Technology Devices and the Child Outcomes

	Number					
Type of Device	Studies	Effect Sizes	Mean Effect Sizes	95% CI	*Z*-Test	*p*-value
Group Design Studies						
Switch Interface	5	9	1.04	.79-1.29	8.07	.0000
Computer	32	65	1.03	.96-1.11	26.96	.0000
Augmentative Communication	4	13	1.77	1.41-2.14	9.48	.0000
Powered Mobility	2	7	.49	.22-.75	3.53	.0004
Single Participant Design Studies						
Switch Interface	26	65	1.63	1.38-1.87	13.13	.0000
Computer	11	37	2.07	1.75-2.40	12.62	.0000
Augmentative Communication	18	75	2.71	2.48-2.93	23.46	.0000
Powered Mobility	6	36	1.20	.87-1.53	7.20	.0000
Weighted/Pressure Vests	7	25	.12	-.27-.51	0.59	.5525

Table 3

Average Effect Sizes, 95% Confidence Intervals (CI) and the Z-test Results for the Relationships Between the Use of the Assistive Technology Devices and the Different Child Outcome Domains

Outcome Domain	Number: Studies	Number: Effect Sizes	Mean Effect Size	95% CI	*Z*-Test	*p*-value
Cognitive Development	49	78	1.16	1.06-1.26	22.85	.0000
Social Development	11	28	.64	.45-.82	6.74	.0000
Communication Development	43	123	1.50	1.37-1.63	22.58	.0000
Literacy Development	13	14	1.40	1.26-1.54	19.54	.0000
Adaptive Development	5	10	1.75	1.30-2.19	7.67	.0000
Motor Development	8	24	1.63	1.27-1.99	8.85	.0000
Behavior Engagement	13	30	.84	.60-1.08	6.85	.0000

Table 4

Average Effect Sizes and 95% Confidence Intervals (CI) for the Relationships Between the Use of the Assistive Technology Devices and the Child Outcomes for Children with Different Identified Conditions

	Number		Mean			
Child Condition	Studies	Effect Sizes	Effect Sizes	95% CI	*Z*-Test	*p*-value
Group Design Studies						
Pervasive Developmental Disorders	4	12	.90	.54-1.25	4.94	.0000
Chromosomal Aberrations	2	7	1.77	1.23-2.30	6.47	.0000
Physical Disabilities	4	10	.61	.35-.87	4.59	.0000
Speech/Language Disorders	9	18	.44	.22-.67	3.87	.0001
Sensory Disabilities	2	6	1.64	1.37–1.92	11.72	.0000
Developmental Delay	11	24	.90	.79-1.01	16.50	.0000
Multiple Disabilities	11	17	1.29	1.17-1.41	20.91	.0000
Single Participant Design Studies						
Pervasive Developmental Disorders	10	38	2.11	1.80-2.43	13.03	.0000
Chromosomal Aberrations	9	16	2.59	2.10-3.08	10.37	.0000
Physical Disabilities	17	65	1.67	1.43-1.91	13.48	.0000
Spinal Aberrations	5	17	1.02	.54- 1.49	4.19	.0000
Speech/Language Disorders	3	12	2.78	2.22-3.35	9.63	.0000
Sensory Disabilities	4	5	.64	-.24 -1.52	1.43	.1524
Developmental Delays	9	27	2.86	2.49-3.24	114.87	.0000
Multiple Disabilities	20	33	2.04	1.70 -2.38	11.73	.0000

Table 5

Average Effect Sizes and 95% Confidence Intervals (CI) for the Relationships Between the Use of the Assistive Technology Devices and the Child Outcomes for Studies Using Different Research Designs

	Number		Mean			
Type of Design	Studies	Effect Sizes	Effect Sizes	95% CI	*Z*-Test	*p*-value
Group Design Studies						
One Group Pre-Post Test	26	57	1.08	1.01-1.16	26.66	.0000
One Group Between Conditions	10	26	.47	.30-.65	5.29	.0000
Between Group Comparisons	7	11	1.34	1.14-1.54	13.19	.0000
Single Participant Design Studies						
AB Designs	25	57	2.11	1.85-2.37	15.95	.0000
ABA Designs	10	32	1.57	1.22-1.91	8.85	.0000
Multiple Baseline Designs	13	66	2.24	2.00-2.48	18.21	.0000
Alternating Treatment Designs	12	58	1.91	1.65-2.16	14.51	.0000

Is this an Assistive Technology device?

1	Triangular tube adapted with Velcro and used to display pictures	**Yes**	**No**	**It depends**	**I don't know**
2	Single message voice output button	**Yes**	**No**	**It depends**	**I don't know**
3	Large and ergonomic grip pen	**Yes**	**No**	**It depends**	**I don't know**
4	A variety of adapted writing instruments	**Yes**	**No**	**It depends**	**I don't know**
5	Picture-selection voice output communicator	**Yes**	**No**	**It depends**	**I don't know**
6	A wide tooth comb used to hold a nail	**Yes**	**No**	**It depends**	**I don't know**
7	Styrofoam fruit tray cut with a slit and used upside down to hold playing cards	**Yes**	**No**	**It depends**	**I don't know**
8	A small blow-up swimming pool used in a reading nook	**Yes**	**No**	**It depends**	**I don't know**
9	A contractor's clipboard that holds and displays an individualized schedule made with pictures, Velcro and a sticky-back dry-erase pad	**Yes**	**No**	**It depends**	**I don't know**
10	A hard-page book with binder clip page-turners	**Yes**	**No**	**It depends**	**I don't know**
11	Stretchy shoelaces that do not require tying	**Yes**	**No**	**It depends**	**I don't know**
		Yes	**No**	**It depends**	**I don't know**
		Yes	**No**	**It depends**	**I don't know**
		Yes	**No**	**It depends**	**I don't know**
		Yes	**No**	**It depends**	**I don't know**
		Yes	**No**	**It depends**	**I don't know**
		Yes	**No**	**It depends**	**I don't know**

Milbourne, S.A., August 2016 DaSy

Assistive Technology Use with Young Children:

Myths and Mythbusters

CATEGORY	MYTH/MYTHBUSTER	BUSTER AIDS
AGE	Children with disabilities ages birth - 5 are too young to benefit from AT; AT is not for children under 2; A child must be "old enough" to benefit from AT MYTHBUSTER: Use of AT for even a short time has been shown to yield positive outcomes even for the youngest child/children	Video - SLP working with 18 month old twins using Vantage Lite http://www.youtube.com/watch?v=7eXD-6TJJ7I Video - Maya's Journey (10 MInutes) http://www.youtube.com/watch?v=UyGr7_B2Nrk
PRICE	AT is too expensive to use with young children MYTHBUSTER: AT is made up of a range of strategies and devices that also have a range of prices	Rapid advances in technology are being seen and felt in the Assistive Technology field. Assistive technology is more numerous and available in a range of prices. Open Source technology is also resulting in free high quality web based solutions. http://www.oatsoft.org/Software/listing/Repository EZ-AT Guide PDF version: http://www.pacer.org/stc/pubs/EZ-AT-book-2011-final.pdf iBook: https://itunes.apple.com/us/book/ez-at-2/id781912747?mt=11

SOURCE	AT comes from specialized sources MYTHBUSTER: As the world of AT and IT and ET collide more universal technology is being developed for all learners not just learners with disabilities.	http://www.fisher-price.com/en_US/brands/laughandlearn/products/66016 Tiggly shapes http://tiggly.com/ (sold in Apple stores) "Ideas to Share" on the Tots N Tech web site www.tnt.asu.edu Go Baby Go providing young children mobility access
ALTERNATE	AT is only high tech or computer based technology; AT must be powered: wired, electronic or digital MYTHBUSTER: AT is comprised of a range of no tech, low tech, mid tech and high tech devices	WeeAT range of items for a particular activity (e.g. bubble blowers) https://sites.google.com/a/udel.edu/weeat/home/at-gamut TIKES Myth video #1 https://www.youtube.com/embed/lAc09Ja1TPU?rel=0&wmode=transparent&autoplay=1 Tots N Tech Pinterest http://www.pinterest.com/totsntech/ DIY activities http://www.pinterest.com/simontechcenter/diy-assistive-technology/
SEVERE	AT is only for low incidence disabilities; AT is primarily for children with severe/significant disabilities MYTHBUSTER: AT can provide benefits for all disabilities and identified based on the need of the child and the expectations of the caregiver/teacher/environment	TIKES - mythbuster video #1 http://www.youtube.com/embed/lAc09Ja1TPU?rel=0&wmode=transparent&autoplay=1 EZ-AT Guide PDF version: http://www.pacer.org/stc/pubs/EZ-AT-book-2011-final.pdf iBook: https://itunes.apple.com/us/book/ez-at-2/id781912747?mt=11

FIRST	There are prerequisites to the use of AT that a child must have before considering AT MYTHBUSTER: There are NO prerequisites to the use of AT (ties in with Myth #1)	The notion of presuming competence - Emma's Hope Book - Blog http://emmashopebook.com/2013/05/14/parenting-presuming-competence/ Babies Driving Robots: Dr. Cole Galloway's Breakthrough Research https://youtu.be/PQnPcIGY02I
DEVELOPING	Using AAC will inhibit normal speech/language development; AT can interfere with development; AT can keep children from developing as fully as possible MYTHBUSTER: Using AAC will not interfere with normal speech development and may promote the development of speech and language	Tots N Tech Brief: Systematic Review of Studies Promoting the Use of Assistive Technology Devices by Young Children with Disabilities https://tnt.asu.edu/sites/default/files/ResearchBriefVolume8-1.pdf Janice Light's AAC Kids http://aackids.psu.edu/index.php/page/show/id/2/index.html Neek using her PODD https://www.youtube.com/watch?v=TK-YiCjEbFM
SPECIALIST	AT can only be used in a setting where an AT specialist is available; At must be determined and provided by an AT specialist; AT must be selected by a specialist (who chooses as above); AT use requires extensive training MYTHBUSTER: AT can and should be used by multiple professionals and family members across a variety of routines and activities and environments (home, school, community, etc.)	CARA's Kit (for Preschoolers and for Toddlers) http://inclusioninstitute.fpg.unc.edu/sites/inclusioninstitute.fpg.unc.edu/files/handouts/Milbourne_SA%20CARAs%20Kit%20NECTAC%202012.pdf http://www.kirkwood.edu/pdf/uploaded/1163/caras_kit_7_adaptation_lessons.pdf CONNECT Module - http://community.fpg.unc.edu/connect-modules/learners/module-5 The IRIS Center - Early Childhood Environments:Designing Effective Classrooms http://iris.peabody.vanderbilt.edu/module/env/#content

SCREEN	Screen time is inappropriate for young children. (when, how and if it is appropriate; active vs. passive) MYTHBUSTER: When used intentionally and in a planful manner, screen time opens doors to possibilities that other (passive) technologies do not provide.	Lakeside Aitism Center: http://www.youtube.com/watch?v=ZvSUI4zmjaU iTikes Keyboard http://www.youtube.com/watch?v=ZRxl7BQfneU
SKILL	AT can be selected based only on a child's skill level (excluding environment/expectations/adult caregiver perceptions) MYTHBUSTER: AT that is easy to use, familiar, that "fits" the environmental context, and selected with family/caregiver input is best because it will be used	Virginia's Integrated Training Collaborative - http://www.veipd.org/main/sub_assist_tech.html and http://penxy.com/hadu Participation-based service approach presented by CFSRP http://jeffline.tju.edu/cfsrp/pbs.html
EQUIPMENT	AT is another term for Durable Medical Equipment MYTHBUSTER: AT is used to support developmental and educational needs of a child compared to most durable medical equipment (DME) which is used to support a child's medical needs; some may consider a wheelchair AT, others DME.	United States Department of Education, Office of Special Education & Rehabilitative Services, Office of Special Education Programs DOE/OSEP Memos: AT Clarification of Public Policy, (rev. 1/03) http://atto.buffalo.edu/registered/ATBasics/Foundation/Laws/OSEPletters.pdf

REUSE	When a child no longer needs a particular AT item it cannot be reused by other children MYTHBUSTER: There are options for re-distributing AT devices	Example AT reuse programs: California https://exchange.abilitytools.org/ Delaware http://www.dati.org/v3/home.php Michigan https://www.atxchange.org/ National http://www.passitoncenter.org

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