

AT and Young Children: Confidence, Experience and Education of Early Intervention Providers



Due to legislative mandates and published recommendations for best practice, the use of Assistive Technology (AT) with young children by early intervention practitioners has increased in the last decade (TAP Bulletin). The use, application and provision of AT for young children and their families appear to vary widely across states, disciplines and among individual practitioners involved in early intervention. Variables such as practitioner confidence, experience and training may influence early interventionists (EIs) ability to provide appropriate AT devices and services to infants and toddlers with disabilities.

The provision of AT services across disciplines and training has not been widely studied. Lesar (1988) examined the preparation needs, concerns, and perceived barriers of 62 early childhood special education professionals, serving children 3 to 5 years of age. The majority of respondents (68%) felt that they were unprepared to provide and use assistive technology with young children. Participants reported that their most effective training experiences were hands-on personal experiences with AT, while coursework and workshops were the least reported professional preparation experiences reported. The majority of respondents rated themselves as novices on their knowledge of AT devices and services. Five problem areas, reported by the participants, included: lack of training and on-site technical assistance, availability and funding of AT, family involvement in assessments and services, assessing AT needs and selecting AT devices and ongoing AT service provision.

While other articles have provided models, theoretical frameworks and recommendations for practitioners working with young children and AT (Judge, 2002; Langone, Malone, & Kinsley, 1999; Long, Huang, Woodbridge, Woolverton, & Minkel, 2003; Stremel, 2000), no studies have been conducted that measure the current practices and abilities of EI personnel. Long and colleagues (2003) recommend that practitioners follow a 10-step outcome driven model of AT practice that includes AT evaluation and assessment, matching AT and AT service to need, securing funding to devices and services, implementation and follow-up. Current practice recommendations from the Division for Early Childhood (Stremel, 2000) also suggest that professionals have specific skill sets in utilizing AT in intervention programs, collaboration with families and other EI personnel in planning and implementation of services and accessing AT information and support.

One way of assessing the ability of EI's to participate in AT related service activities is to examine their confidence level in specific AT tasks with young children and their families. Self-confidence or self-efficacy,

as defined by Bandura (Bandura, 1977) is a person's belief in his or her ability to successfully perform a specific behavior. According to Bandura's social learning theory self-efficacy develops from a person's history of successes and failures, social comparison between peers, verbal feedback from others and emotional arousal (Bandura, 1989). It has been linked to many task engagement variables, including persistence, effort, goal-setting, strategy usage, choice, coping and stress-management (Berry & West, 1993; Wells-Parker, Miller, & Topping, 1990). A person's sense of confidence can vary in relation to training and experience. To date, EI self-confidence in the provision of AT services has not been studied.

To understand the role of Early Interventionist (EI) confidence in the use and application of AT, an Assistive Technology Confidence Scale (ATCS) was developed and distributed to early intervention practitioners. This study will describe the development and psychometric properties of the ATCS and the relation between the ATCS scores, overall practitioner self-efficacy, years of experience, education and training and use of assistive technology for infants and toddlers.

METHODS

Seventy-eight early intervention (EI) service providers in three different locations completed the ATCS, the Early Interventionist Self-Efficacy Scale (EISES) and questions pertaining to discipline, level of education, and years working as an EI. Twenty-nine EIs were recruited during an EI training in Philadelphia, 7 EIs were recruited during a session at the 2002 DEC conference and the remaining 43 EIs were recruited in Arizona from an existing database of professionals.

Practitioners from a variety of early intervention disciplines were represented in the sample including: service coordinators (9), occupational therapists (14), physical therapists (20), speech-language pathologists (11), early childhood teachers (15) and others (9). Most EIs held a master's degree (36) or a bachelor's degree (32). The mean years practicing in early intervention was 10.31, with a range of 1 to 30 years.

Confidence Measures

ATCS. <http://tnt.asu.edu/appendix/AssisTechConfScale.pdf> The ATCS was developed for use in this study and was based on the DEC Recommended Practices in Technology Applications (2002). The scale was written to measure EI personnel confidence in AT intervention, AT assessment and ability to access AT resources and information. The scale consisted of 24 statements (e.g., I feel confident in my ability to participate in an assistive technology assessment) that were rated on a 6-point Likert-like scale ranging from 1= strongly disagree to 6= strongly agree.

An exploratory factor analysis was performed to determine the underlying constructs of the ATCS. Bartlett's Test of Sphericity was significant (Chi-square = 1680.64, df=276, p=.000) and the Kaiser-Meyer-Olkin measure was .895 (exceeding the required .50), indicating that the data were sufficient for a factor analysis. Principal axis factoring through SPSS on the 24-item scale was used to estimate the number of

factors with eigenvalues that exceeded one (Tabachnick & Fidell, 2001). Four factors were extracted, however, after the third factor, changes in successive eigenvalues were small (accounted for less than 6% of the variance). Because the first three factors appeared most meaningful and closely replicated the original theoretical construct of the scale, the principal factor analysis was repeated forcing a three-factor solution. The first factor had an eigenvalue of 13.75 accounting for 57% of the variance. The second factor had an eigenvalue of 1.701 accounting for 7.09% of the variance and the third factor had an eigenvalue of 1.48 and accounting for 6% of the variance. Together, all three factors accounted for 70.55% of the total variance.

These three factors were rotated in a promax rotation with Kaiser Normalization. The items with factor loadings above .40 on each factor are shown in Table 1. All items on the ATCS loaded on one of the three factors, except item 4, which cross-loaded on factors 1 and 3. Analysis of the factor loadings revealed that questions pertaining to use and application of AT loaded onto factor 1 (10 items), questions pertaining to a person's ability to access AT information and support loaded onto factor 2 (7 items), and questions pertaining to AT assessment loaded onto factor 3 (6 items). The ATCS was found to be reliable across all participants (Cronbach's alpha = .97). The three factors also retained their reliability, at alpha = .96 (factor 1), alpha = .91 (factor 2) and alpha = .87 (factor 3).

EISES. <http://tnt.asu.edu/appendix/EISES.doc> The EISES (Early Intervention Self Efficacy Scale) was used to measure overall practitioner efficacy. The EISES was adapted from the Teacher Efficacy Scale (TES), with phrasing and wording relevant for EIs. The TES has been shown to demonstrate convergent and discriminate validity (Gibson & Dembo, 1984). The scale consisted of 16 statements and was broken into two subscales, Personal Intervention Efficacy (e.g. "If a family had difficulty implementing plans we have developed, I would be able to accurately assess whether the plans required modification") and General Intervention Efficacy (e.g. "When it comes right down to it, early intervention personnel really can't do much because most of a child's performance depends on the home environment"). The EISES was rated on a 7-point Likert-like scale, ranging from 1=strongly disagree to 6=strongly agree. Lamorey and Wilcox (2003) provided internal consistent reliability for the EISES using a sample of 69 EIs (standardized item alpha = .80).

RESULTS

Scores on the ATCS. Overall, EIs reported fair to good confidence on the ATCS ($M=4.40$, $SD=1.03$). Differences among the means on the three factors were statistically significant, $t(77)=34.28$, $p=.000$. EIs rated themselves as more confident in the areas of AT assessment and use/application (factors 1 and 3), than in the ability to access and use information pertaining to AT (factor 2).

Group differences among the disciplines were also statistically significant, $F(5, 72) = 4.043$, $p=.003$. Statistically significant differences were found between the service coordinator group and the other four disciplines. Service coordinators rated themselves lower than all other disciplines on all three factors. Table 2 shows the means and standard deviations of each factor and of the 6 disciplines by factor.

Relation between the efficacy scales, years of experience and education. Overall AT confidence on the ATCS was positively related to practitioner self-efficacy on the EISES ($r=.341$, $p=.002$). The Personal Intervention Efficacy factor of the EISES was also positively related to all three factors on the ATCS. Years of experience in EI was significantly related to confidence in AT assessment (ATCS factor 3), but was not related to the overall score on the ATCS or the other two factors. Level of education was not related to the ATCS scores. Table 3 shows the correlations between the efficacy scales, years of experience and education.

DISCUSSION AND FUTURE APPLICATIONS

This brief presented data for ratings on the ATCS scale in a sample of EIs from a variety of different disciplines. The factor structure of the ATCS was examined and three factors emerged. Factor 1 included questions regarding EI confidence in using AT with young children. Factor 2 included questions about EI confidence in accessing information and resources about AT in their daily practices and the final factor contained questions about confidence in AT assessment with young children. The ATCS factor structure revealed in the statistical analysis is similar to the proposed theoretical constructs pertaining to assessment, intervention and support.

Overall, EIs rated themselves as fairly to mostly confident on all three factors on the ATCS. They were most confident in their ability to use AT in therapy with young children and in their ability to conduct or participate in AT assessments. They were least confident in their ability to obtain and use AT resources and support services. Service coordinators rated themselves as least confident on all areas of the ATCS, as compared to other disciplines. This may be due to the fact that service coordinators tend to do more case management and less direct service to families with young children and therefore do not feel as confident in these areas.

It was expected that EIs with higher levels of education and more years of experience would exhibit higher confidence scores in all domains of AT service provision. However, this was not the case for this sample of EIs. Confidence in use and application of AT with young children did not appear to be higher in EIs with higher degrees or in EIs with more years of experience. Confidence in AT assessment was higher for EIs with more years of experience, but not for EIs with higher levels of education. It may be that other factors associated with training and experience, such as attendance at workshops or opportunities for on-the-job training experiences in AT, may have more of an influence on EI confidence than formal education or years working in early intervention.

The ATCS appears to be a valid measurement of AT confidence in different areas important to AT services. Uses of this rating scale may be useful in assessing change in confidence levels before and after AT trainings or in assessing potential areas for training in groups of EI personnel. Future research using the ATCS may

also include examining how variables such as training and experience influence confidence in different domains of AT service delivery.

Table 1: Factor structure of the ATCS using principal axis factoring with promax rotation (Kaiser Normalization)

ATCS Item	Factor		
	Use and Application	Access Information / Support	Assessment
5. Decide whether an assistive technology device/ tool is the least intrusive, yet most effective device available for an individual child.	.629		
6. Utilize assistive technology equipment in the assessment process.	.555		
10. Utilize assistive technology as a vehicle for more effectively serving children and families.	.981		
11. Evaluate the effectiveness of an assistive technology device / tool.	.868		
12. Make provisions for assistive technology devices and services on a child's IFSP.	.829		
13. Assist families in the use, maintenance and generalization of assistive technology to facilitate their children's development.	.594		
14. Ensure that children have access to assistive devices across settings (i.e. home, daycare, etc.)	.834		
15. Help families incorporate the use of assistive devices into their daily routines (i.e. mealtimes, shopping, etc.)	.982		
16. Collaborate with related professionals about the use and application of assistive technology for individual children and families.	.705		
21. Coordinate assistive technology support for families undergoing service transition (i.e. from EI services to preschool services).	.581		
17. Utilize state and local AT resources to gather information about assistive technology assessment, intervention or funding.		.863	
18. Locate appropriate assistive technology funding sources to help families acquire AT equipment.		.884	
19. Obtain training in assistive technology assessment and intervention		.422	
20. Gather information for families on maintenance services for repair and replacement of assistive technology devices.		.667	
22. Make low tech devices/ tools (such as picture symbols, hand grips, positioning supports) for families.		.730	
23. Adapt toys, tools or equipment (such as enlarging knobs on puzzles, putting handles on cups, placing cushioned support in highchairs) for use by individual children.		.500	
24. Find the most up-to-date information about the availability and use of high tech AT devices (such as wheelchairs, augmentative communication devices, etc.)		.829	
1. Assess a family's/ child's need for assistive technology related to performance of a functional skill such as play, mobility or communication.			.817
2. Refer a family to an assistive technology specialist if needed.			.696
3. Participate in an assistive technology assessment.			.726
4. Determine whether an assistive technology device will increase a child's ability to participate in activities and routines at home or in community settings.	.439		.549
7. Base assistive technology assessments on family preferences.			.661
8. Be responsive to a family's culture and language when making decisions			.463

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concerning assistive technology assessment and intervention.			
9. Collaborate with related professionals during AT assessment process.			.637

Table 2. Means and standard deviations on the ATCS by discipline.

	Total ATCS		Use and Application		Access Information /Support		Assessment	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Total Group (n = 78)	4.40	1.03	4.41	1.14	4.09	1.21	4.71	1.07
Service Coordinators (n=9)	3.15	1.47	3.31	1.32	2.83	1.30	3.19	1.36
Occupational Therapists (n=14)	4.63	0.801	4.67	0.81	4.12	1.10	5.11	0.72
Physical Therapists (n=20)	4.71	0.69	4.86	0.62	4.37	0.83	4.81	0.89
Speech/Language Pathologists (n=11)	4.70	1.29	4.59	1.51	4.43	1.43	5.15	0.88
Teachers (n=15)	4.40	0.86	4.27	1.23	4.24	0.95	4.78	0.89
Others (n=9)	4.26	0.97	4.10	1.01	4.00	1.58	4.76	0.97

Table 3. Correlations between the efficacy scales, years of experience and education.

	ATCS Access Information/ Resources	ATCS Assessment	EISES Personal Intervention Efficacy	EISES General Information Efficacy	Education Level	Years of Experience in EI
ATCS Use/Application	.774**	.453**	.412**	.032	.003	.183
ATCS Access Information/ Resources		.656**	.307**	.029	.060	.199
ATCS Assessment			.453**	-.123	.144	.264*
EISES Personal Intervention Efficacy				.056	.056	.252*
EISES General Information Efficacy					-.015	-.133

** $p \leq .05$; * $p \leq .01$

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