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# Statewide Assessment of Professional Development Needs Related to Educating Students With Autism Spectrum Disorder

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## Abstract

Preparing teachers to implement evidence-based practices for students with autism spectrum disorder (ASD) is a pressing need. We surveyed 456 teachers and administrators in a southern state about professional development related to educating students with ASD. Specifically, we were interested in confidence in implementation of evidence-based practices, interest in accessing training on these topics, perceived benefit of different avenues of professional development, and interest in accessing these avenues. Overall, teachers were not very confident in their ability to implement evidence-based practices and address important issues for students with ASD. Surprisingly, lower confidence was not related to increased interest in training. In addition, teachers and administrators perceived workshops to be a more beneficial and attractive avenue of professional development compared with coaching, despite empirical evidence to the contrary. We offer possible explanations for these findings and share implications for administrators, technical assistance providers, and policy makers who make decisions about professional development opportunities.

## Keywords

professional development, training needs, training methods, autism spectrum disorder

Over the past two decades, the field of special education has encountered two important trends: the increasing presence of students with autism spectrum disorder (ASD) in schools and the proliferation of research focused on meeting the multifaceted needs of this group of students. The estimated prevalence of ASD increased 78% between 2002 and 2012 and as many as 1 in 88 children have now been diagnosed with ASD (Centers for Disease Control and Prevention, 2012). The more than 400,000 students with ASD who are currently enrolled in schools in the United States possess a wide range of social, academic, behavioral, and other needs. Meeting the diverse instructional and support needs of this growing population of students presents unique challenges for educators.

To identify instructional practices and educational supports effective for this growing number of students with ASD, many systematic reviews of the intervention literature have been completed. Although most of these reviews have focused on individual interventions or specific educational domains (e.g., Hendricks & Wehman, 2009; Pennington & Delano, 2012), two broader efforts have served to map the range of educational practices currently considered to have compelling research support. In 2009, the National Autism Center published a review of 775 research articles in which

they identified 11 established treatments and 22 emerging treatments for use with students with ASD. More recently, Odom, Collet-Klingenberg, Rogers, and Hatton (2010) conducted a systematic review of the literature and identified 24 evidence-based practices or strategies practitioners could use to teach specific educational targets (e.g., skills and concepts) to students with ASD. Collectively, these reviews provide the field with important guidance on the array of research-based practices that hold particular promise for use with students with ASD.

Despite growing understanding in the field about which educational practices may be effective for students, the in- and post-school outcomes for students with ASD continue to be less than optimal. Descriptive studies indicate large numbers of children and youth with ASD struggle in areas such as academic performance, social relationships, communication, challenging behavior, and self-determination (e.g., Carter et al., 2013; Sanford, Levine, & Blackorby,

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2008). Longitudinal and follow-up studies further suggest many young adults with ASD are leaving school without the skills they need for adulthood. For example, relatively small percentages of young people with ASD are employed, attend college, or live independently in the early years after leaving high school (Shattuck et al., 2012; Wagner, Newman, Cameto, Garza, & Levine, 2005).

One factor that may contribute to these outcomes is the extent to which practices known to be effective for students with ASD are actually implemented in schools. The field's expanding efforts to identify evidence-based educational practices do not, by themselves, ensure educators are prepared to accurately implement these practices. Indeed, the enduring gap between research and practice continues to be highlighted in the literature (e.g., Cook & Odom, 2013).

Unfortunately, evidence suggests prevailing approaches for training and professional development may be insufficient for preparing practitioners to implement evidence-based practices for students with ASD. Many teachers leave their pre-service training poorly prepared to meet the complex needs of students with ASD. In their survey of practicing teachers, Morrier, Hess, and Heflin (2011) found that most educators reported not having received instruction on evidence-based practices for students with ASD during their pre-service preparation. Although increasing numbers of teacher preparation programs now offer coursework related to students with ASD, the quality of these efforts and the extent to which classes address evidence-based practices appear to be quite variable (Barnhill, Polloway, & Sumutka, 2011; Barnhill, Sumutka, Polloway, & Lee, 2013). Widely used professional development approaches may also have limited impact on the capacity of practicing teachers to implement evidence-based practices for students with ASD. For example, one of the most common avenues of professional development—stand-alone workshops without follow-up training and support—has been shown to have limited impact on improving accurate implementation of evidence-based practice (e.g., Hall, Grundon, Pope, & Romero, 2010; Smith, Parker, Taubman, & Lovaas, 1992). However, more effective models of professional development (e.g., individualized coaching and mentoring; Kretlow & Bartholomew, 2010) are not used widely in schools (Russo, 2004). Given the shortcomings of pre-service and in-service teacher training, it remains unclear how well prepared teachers feel they are to implement evidence-based practices for students with ASD.

To date, relatively little research has focused on the training needs of teachers responsible for educating students with ASD. In her study of 498 special educators, Hendricks (2011) found that teachers reported very modest levels of knowledge and implementation of skill competencies (e.g., characteristics of autism, social skills, behavior, etc.) related to ASD. Morrier and colleagues (2011) surveyed 90 teachers of students with ASD and found that

neither past training experiences nor teacher characteristics predicted self-reported use of assorted teaching strategies (e.g., social stories, cognitive behavioral modification, auditory integration training, etc.) for students with ASD. In addition, results indicated that less than 5% of teachers surveyed used evidence-based practices in their classrooms. Additional survey studies have explored the types of interventions and treatments used by teachers (Hess, Morrier, Heflin, & Ivey, 2008), attitudes of teachers toward inclusion (Hart & Malian, 2013), and perspectives on teacher preparation and professional development programs as well as ASD-related topics (Segall & Campbell, 2012).

Collectively, these initial survey studies indicate professional development needs may be both substantial and highly variable across practitioners who educate students with ASD. However, several important questions about the focus and format of professional development related to educating students with ASD remain unanswered. First, prior studies have not examined the professional development needs of educators in relation to those focused intervention practices identified as evidence-based for students with ASD (Odom et al., 2010). Knowing the extent to which educators feel confident implementing each of these practices—as well as their interest in receiving additional training—could inform the work of districts, state agencies, and other entities charged with designing professional development for teachers. Adopting a more data-driven approach for discerning the training needs of educators could increase the relevance of training opportunities in a particular district or state.

Second, it is unclear whether different professionals working within schools share similar or divergent views about which training topics should be prioritized for educators who work with students with ASD. School- and district-level administrators typically play a prominent role in determining which educational interventions and strategies receive primary attention within ongoing professional development. The extent to which the training priorities of administrators and educators align has not been examined.

Third, little is known about the factors that may influence teachers' desire for additional training on evidence-based practices. The confidence teachers possess related to implementing specific practices may be one salient factor. For example, a teacher who already feels certain of her ability to effectively implement time delay procedures may be less likely to seek out additional training on this practice. The specific roles staff members assume within their schools may be another influence on professional development preferences. For example, a general education teacher who has students with ASD enrolled in his classroom may be more interested in professional development on inclusive practices than a special educator working within a self-contained setting. In addition, the educational experiences of teachers may also impact their desire for additional

training. For example, prior access to related trainings, or extensive experience working with students with ASD may influence interest in further professional development.

Fourth, the avenues through which professional development is offered is as important to consider as the content addressed within those trainings. Although certain training avenues (e.g., one-to-one coaching) have more research support than others (e.g., “one-shot” workshops), it is unclear whether these avenues are viewed by practitioners as either beneficial or ones they would be likely to access. Preferences regarding professional development avenues may be further influenced by the format, length, and scope of the training, as well as the ease with which trainings can be accessed. For example, the availability of certain types of training may be more limited in rural areas. Furthermore, the needs of educators in rural areas and the ability of administrators in those rural areas to respond to educator needs may vary significantly due to availability of resources.

## Purpose and Research Hypotheses

The purpose of this project was to examine the perspectives of a statewide sample of teachers and administrators on the professional development needs of staff working with students with ASD. Specifically, we explored four related aspects of professional development for teachers. First, we asked teachers and administrators about (a) their (or their staff’s) confidence implementing evidence-based practices for students with ASD and (b) their desire for additional training related to these topics. We hypothesized teachers and administrators would be most interested in training focused on those practices for which teachers expressed the lowest levels of implementation confidence. Second, we examined whether teacher role (i.e., general educator vs. special educator) and years of experience were associated with confidence in implementation and desire to access training related to evidence-based practices for students with ASD. We anticipated special educators, whose initial training and daily responsibilities may be more directly related to educating students with ASD, would report greater confidence, and desire more training in implementing and addressing ASD-related training topics compared with general educators. In addition, we predicted teachers with more experience would express more confidence related to practice implementation and would thus be less interested in professional development.

Third, we queried teachers and administrators about the potential benefits of different avenues of professional development and the likelihood teachers would access these various training possibilities. Expecting administrators and teachers would desire high-quality training, we hypothesized that the avenues each rated as most beneficial would be the same avenues that each said would most likely be accessed. Fourth, we were interested in whether interest in

different avenues of professional development would differ by geographic region. Because centralized trainings often require disproportionately more travel for teachers in rural areas, we anticipated these teachers might be more interested in online or in-district avenues of training requiring little or no travel.

## Method

### Participants and Recruitment

We sought to recruit a representative sample of teachers, special education supervisors, and school administrators working with students with ASD in the state of Tennessee. Using a comprehensive list of school principals in the state and a Department of Education database of all school-based special education supervisors, we e-mailed a survey description and electronic survey link to everyone on these two lists. We indicated the purpose of the survey was to gather input from teachers, administrators, and related service providers so The Treatment and Research Institute for Autism Spectrum Disorders (TRIAD), a state-funded autism technical assistance provider, could more closely align their support with the needs identified by practitioners. We invited principals to complete the survey themselves as well as to forward the link to teachers and related service providers who work with students with ASD. Similarly, we asked special education supervisors to complete the survey and to forward it to other district- or school-level personnel who work with students with ASD. Our initial dissemination of survey information resulted in 1,577 successful emails (200 emails were returned as undeliverable). A follow-up email was sent to the same list of potential respondents approximately 3 weeks later. We provided no financial incentives for participation.

Our sample included 456 participants who completed the survey and identified themselves as teachers or administrators, including 241 special education teachers, 33 general education teachers, 126 school administrators (e.g., principal, assistant principal), 10 school-level special education supervisors, and 36 district-level special education administrators responsible for overseeing services for students with ASD. Demographics for each group are displayed in Table 1. We aggregated these respondents into two groups: teachers ( $n = 274$ ) and administrators ( $n = 172$ ). We excluded from this analysis related service providers and paraprofessionals who responded to the survey.

**Teachers.** On average, teachers reported having 8.7 ( $SD = 7.6$ ) years of experience in their current position, 15.4 ( $SD = 9.8$ ) years of total experience in the field of education, and 10.0 ( $SD = 7.7$ ) years of experience working with students with ASD. Teachers had an average of 2.8 ( $SD = 2.6$ ) students with ASD on their current caseload. In terms of

**Table 1.** Respondent Demographics by Stakeholder Group.

	Special education teacher (n = 241)			General education teacher (n = 33)			School administrator (n = 126)			School-level special ed. supervisor (n = 10)			District-level special ed. administrator (n = 36)		
	M	SD	%	M	SD	%	M	SD	%	M	SD	%	M	SD	%
Years of experience															
In current position	8.79	7.74		7.73	6.43		7.16	6.10		8.50	8.92		9.56	7.18	
In field of education	15.45	9.99		4.85	8.70		23.81	9.13		26.80	8.04		26.92	9.58	
Working with students with ASD	10.63	7.65		5.03	6.62		13.11	7.87		21.00	9.83		19.28	8.83	
Students with ASD on current caseload	3.90	1.36		3.61	1.54		NA	NA		NA	NA		NA	NA	
Professional development hours in past year	2.97	2.67		1.67	2.09		NA	NA		NA	NA		NA	NA	
Level of students with ASD served															
Pre-K			14.1			6.1			4.0			10.0			2.8
Elementary			48.5			54.5			70.6			40.0			11.1
Middle			21.2			36.4			13.5			10.0			8.3
High			14.9			3.0			11.9			0.0			0.0
Across levels			1.2			0.0			0.0			40.0			77.8
Highest level of education															
Bachelor's degree			40.7			33.3			0.0			20.0			0.0
Master's degree			57.7			63.6			79.4			70.0			77.8
Doctoral degree			1.7			3.0			20.6			10.0			22.2
School district locale <sup>a</sup>															
Urban			14.5			12.2			26.4			11.1			22.2
Urban fringe			54.3			39.4			32.8			33.3			19.5
Town			5.4			24.2			8.8			22.2			11.1
Rural			25.7			24.3			32.0			33.3			47.2
Attended state-funded training provided by TRIAD in past year															
Yes			23.7			6.1			NA			NA			NA
No			70.1			90.9			NA			NA			NA
Not sure			6.2			3.0			NA			NA			NA

Note. NA = not applicable; TRIAD = Treatment and Research Institute for Autism Spectrum Disorders, a state-funded technical assistance provider.

<sup>a</sup>Based on metro-centric locale codes assigned by the National Center for Education Statistics (Institute of Educational Sciences, 2012).

school level, 13.6% primarily served preschool students, 49.3% elementary students, 23.0% middle school students, 13.5% high school students, and 1.1% served students across multiple levels. Most teachers (58.4%) held a master's degree as their highest level of education, while 39.8% held a bachelor's degree and 1.8% held a doctoral degree. On average, they reported having attended 3.9 (*SD* = 1.4) total hours of professional development over the past year. More than one third (37.4%) reported having attended a training by the state's ASD technical assistance provider in the past year.

**Administrators.** On average, administrators had 7.7 (*SD* = 6.6) years of experience in their current position, 24.6 (*SD* = 9.2) years of total experience in the field of education, and 14.9 (*SD* = 8.7) years of experience working with students with ASD. In terms of school level, 4.1% primarily served preschool students, 54.4% elementary students, 12.2% middle school students, 8.7% high school students, and 18.6% served students across multiple levels. The highest level of education for 78.5% of administrators was a master's

degree, while 1.2% held a bachelor's degree and 20.3% held a doctoral degree.

**Schools.** Teachers and administrators came from 89 public school districts and one private school, representing 65% of all districts in the state. These school districts were diverse in size, with 7 serving fewer than 1,000 students; 46 serving 1,000 to 2,000 students; 18 serving 5,000 to 10,000 students; 15 serving 10,000 to 50,000 students; and 3 districts serving more than 50,000 students. Student demographics also were diverse across these districts. The percentage of students identified as European American ranged from 7.3% to 99.3% (*M* = 81.7%; *SD* = 18.0% across schools). In 4 districts, the majority of students were African American. The percentage of students qualifying for free and reduced-price meals ranged from 12.4% to 85.1% (*M* = 60.6%; *SD* = 11.7%); in 86.5% of these districts, more than half of students were economically disadvantaged. The percentage of students with disabilities ranged from 9.8% to 25.0% across districts (*M* = 15.8%; *SD* = 3.0%). Based on metro-centric locale codes assigned by the National Center for Education

Statistics (Institute of Educational Sciences, 2012), respondents came from a diversity of geographic regions that generally mirrored the distribution of teachers working in these regions. Specifically, 18.2% of respondents worked in districts in urban areas (vs. 31.2% of educators statewide), 43.9% worked in districts in urban fringes (vs. 24.8%), 8.6% worked in districts located in towns (vs. 10.9%), and 29.2% worked in districts in rural areas (vs. 33.2%).

### Survey Instrument

Teachers and administrators were asked to complete a 129-item web-based survey using the REDCap platform (Harris et al., 2009). The survey included four major topics: (a) respondent demographics, (b) confidence implementing evidence-based practices and related topics, (c) desire for training on these practices, and (d) views on professional development avenues related to identified training needs. Although we designed two separate versions of the survey for teachers and administrators, questions on each version mirrored the other and wording differences are noted below.

**Confidence implementing practices.** We presented respondents with 36 different evidence-based practices and training topics related to educating students with ASD (see Table 2 for a complete list). The first 24 items were evidence-based intervention practices for students with ASD, as identified by the National Professional Development Center on Autism Spectrum Disorders (Odom et al., 2010). Each of these interventions was accompanied by a brief, one- to two-sentence description to ensure respondents held a common understanding of what each meant. For example, “Task analysis” included the description, “The process of breaking a skill into smaller, more manageable steps in order to teach the skill.” The remaining 12 items were additional topics frequently addressed as part of professional development efforts. For each item, we asked teachers to rate their level of confidence implementing or addressing each topic for students with ASD. Administrators rated their confidence in how well their staff implements or addresses each topic for students with ASD. Teacher and administrators rated each item using a 5-point, Likert-type scale (1 = *not at all confident*, 2 = *a little confident*, 3 = *somewhat confident*, 4 = *quite confident*, 5 = *very confident*).

**Desire for training.** We were also interested in gauging the extent to which training was desired in relation to each of these 36 topics. We asked teachers how interested they were in participating in training on each topic. Similarly, we asked administrators how interested they were in having their staff participate in training. Both respondents rated each item using a 5-point Likert-type scale (1 = *not at all interested*, 2 = *a little interested*, 3 = *somewhat interested*, 4 = *quite interested*, 5 = *very interested*). In addition, we

asked respondents to identify the top three items for which they most desired training for themselves (teachers) or their staff (administrators). Only three could be selected, and an option for “other topics” was offered.

**Professional development avenues.** We were interested in learning how school staff viewed each of 11 different avenues of professional development (see Table 3). These avenues were drawn from our review of the common avenues described in the literature (e.g., Garet, Porter, Desimone, Birman, & Yoon, 2001; Penuel, Fishman, Yamaguchi, & Gallagher, 2007). First, we asked teachers to indicate how likely each avenue of training would be to benefit them; administrators were asked the extent to which each avenue would benefit their staff. Ratings were provided on a 5-point Likert-type scale (1 = *not at all*, 2 = *a little*, 3 = *somewhat likely*, 4 = *quite likely*, 5 = *very likely*). Second, we asked teachers how likely they would be to access each avenue of training (assuming its availability) in the current year. We asked administrators to provide ratings in reference to their staff. Ratings were provided on a 5-point Likert-type scale (1 = *not at all*, 2 = *a little*, 3 = *somewhat likely*, 4 = *quite likely*, 5 = *very likely*).

### Data Analysis

We used descriptive statistics (i.e., means, standard deviations) to summarize all teacher and administrator ratings. To summarize overall perspectives on evidence-based practice, we calculated average ratings of overall confidence and overall training interest across only the 24 evidence-based practices. We used Pearson’s product-moment correlations to quantify relations among (a) ratings of confidence and training interest, (b) perceived benefits of and interest in various professional development avenues, (c) educational experience and overall training interest, and (d) geographic locale code and interest in professional development avenues. To gauge alignment among participants’ perspectives, we used one-way ANOVA to compare ratings between teachers and administrators.

## Results

### Confidence Implementing Evidence-Based and Related Topics

Overall, teachers expressed only moderate levels of confidence implementing the 24 evidence-based practices (overall  $M = 3.07$ ; individual item means ranged from 2.12-3.54; see Table 2). The evidence-based practices for which the highest percentage of teachers said they had *no* or *little* confidence implementing were pivotal response training (64.2%), speech-generating devices (64.2%), parent-implemented intervention (51.8%), time delay (51.8%), and peer-mediated interventions (51.5%). The percentage of

**Table 2.** Teacher and Administrator Ratings of Interest in Training and Confidence in Teachers Addressing Training Topics.

Items	Teacher ratings (n = 274)					Administrator ratings (n = 172)					ANOVA of teacher/ administrator ratings	
	Interest in training		Confidence		r	Interest in training		Confidence		r	Interest in training	Confidence
	M	SD	M	SD		M	SD	M	SD		F(1, 444)	F(1, 444)
<b>Evidence-based practices<sup>a</sup></b>												
Computer-aided instruction	3.62	1.10	2.81	1.06	.04	3.47	1.09	3.22	1.10	-.13	1.87	14.68**
Functional communication training	3.57	1.15	2.80	1.11	.06	3.71	0.97	2.93	0.96	-.15*	1.86	1.54
Antecedent-based interventions	3.55	1.12	3.14	0.99	-.09	3.81	0.89	3.02	0.82	-.16*	6.30*	1.91
Self-management	3.54	1.14	2.71	0.99	.09	3.72	1.02	2.72	1.05	.02	2.80	.00
Differential reinforcement	3.46	1.10	3.07	1.08	.00	3.54	1.02	3.01	1.02	-.06	.60	.36
Task analysis	3.45	1.12	3.41	0.96	-.05	3.60	0.93	3.27	0.91	-.23**	2.32	2.08
Naturalistic interventions	3.43	1.21	2.56	1.11	.10	3.43	1.07	2.56	1.06	.11	.00	.00
Parent-implemented interventions	3.41	1.22	2.19	1.12	.09	3.55	1.18	2.15	1.09	.10	1.46	.13
Extinction	3.40	1.20	2.77	1.08	.10	3.50	1.01	2.67	1.02	-.01	.80	.87
Pivotal response training	3.39	1.23	2.12	1.05	.09	3.45	1.17	2.21	1.03	.17*	.21	.70
Peer-mediated intervention	3.38	1.21	2.51	1.07	.09	3.35	1.20	2.49	1.12	.05	.09	.02
Reinforcement	3.38	1.13	3.54	0.99	-.08	3.71	0.95	3.40	0.85	-.26**	9.86**	2.21
Response interruption/ redirection	3.37	1.20	2.66	1.11	.00	3.44	1.14	2.99	1.06	-.06	.37	9.60**
Social stories	3.36	1.17	3.09	1.08	-.01	3.53	1.10	3.14	1.08	-.14	2.27	.21
Social skills training groups	3.32	1.22	2.74	1.17	.07	3.47	1.17	2.95	1.14	-.16*	2.68	3.68
Functional behavior assessment	3.31	1.22	3.01	1.14	-.10	3.55	1.16	3.24	1.09	-.28**	4.46*	4.76*
Video modeling	3.30	1.21	2.40	1.12	.06	3.45	1.06	2.03	1.07	.07	1.67	11.73**
Structured work systems	3.24	1.18	2.72	1.15	.04	3.48	1.07	2.70	1.04	.02	4.38*	.02
Prompting	3.22	1.19	3.39	1.06	-.06	3.41	1.04	3.19	1.06	-.14	3.21	3.93*
Discrete trial training	3.19	1.26	2.97	1.20	.12*	3.51	1.09	2.86	1.12	-.05	7.13**	.88
Time delay	3.03	1.21	2.43	1.16	.06	3.19	1.10	2.44	1.08	.11	2.14	.00
Visual supports	3.00	1.26	3.21	1.18	.06	3.37	1.12	3.28	1.05	-.04	9.48**	.42
Speech-generating devices	2.97	1.32	2.19	1.16	.20*	3.05	1.21	2.37	1.23	.04	.39	2.50
Picture exchange communication system	2.95	1.29	2.91	1.27	.08	3.22	1.20	2.88	1.25	.06	4.76*	.05
Average evidence-based practice rating	3.33	0.93	3.07	1.35	.14*	3.48	0.86	2.82	0.74	-.01	2.98	.04
<b>Other training topics</b>												
Inclusive practices	3.57	1.20	2.97	1.08	-.02	3.58	1.10	3.40	1.02	-.24**	.00	17.28**
Technological supports/ accommodations	3.47	1.15	2.73	1.00	.02	3.52	1.12	3.06	0.98	-.06	.18	12.00**
Assessment for instructional programming	3.43	1.20	2.73	1.11	-.01	3.52	1.19	2.97	1.01	-.29**	.56	5.18*
Alternate Assessment	3.34	1.25	2.47	1.16	.01	3.37	1.22	3.01	1.11	-.08	.07	23.03**
Special education laws, regulations, and policies	3.28	1.26	2.89	1.08	-.01	3.40	1.17	3.47	1.04	-.21**	1.02	31.04**
ASD diagnostic methods	3.24	1.31	2.14	1.10	.19**	3.17	1.24	2.82	1.24	-.07	.28	36.44**
Transition planning strategies	3.07	1.35	2.28	1.10	.20**	3.41	1.19	2.85	1.00	.05	9.81**	29.64**
Program evaluation	3.05	1.25	2.31	1.07	.24**	3.38	1.15	2.76	0.97	.06	7.69**	19.84**
Characteristic of ASD	3.01	1.31	3.10	1.17	-.11	3.49	1.12	3.16	1.00	-.15*	15.85**	.32
Community-based instruction	2.96	1.34	2.23	1.20	.39**	3.05	1.22	2.38	1.14	.12	.50	1.89
Career development strategies	2.79	1.39	1.99	1.11	.44**	2.98	1.36	2.19	1.09	.25**	1.91	3.51

Note. *r* = Pearson's product-moment correlation.

<sup>a</sup>Based on review by Odom, Collet-Klingenberg, Rogers, and Hatton (2010).

\**p* < .05. \*\**p* < .01.



teachers saying they were *quite* or *very* confident was highest for reinforcement (55.1%), task analysis (49.3%), prompting (48.5%), visual supports (43.4%), and antecedent-based interventions (37.6%). For other training topics, teacher ratings reflected the lowest confidence for addressing career development and highest confidence related to the characteristics of students with ASD.

Descriptively, the overall confidence expressed by administrators in their staff was slightly lower than teachers (overall  $M = 2.82$ ; individual item means ranged from 2.03-3.40; see Table 2). The evidence-based practices for which the highest percentage of administrators said they had *no* or *little* confidence their staff could implement well were video modeling (68.0%), parent-implemented interventions (65.1%), pivotal response training (62.2%), speech-generating devices (57.0%), and time delay (53.5%). The percentage of administrators saying they were *quite* or *very* confident was highest for functional behavioral assessment (45.9%), reinforcement (44.2%), computer-based instruction (44.2%), task analysis (42.4%), and prompting (41.9%). For other topics, administrators expressed the lowest confidence in the area of career development and the highest confidence in addressing special education laws, regulations, and policies.

### Interest in Professional Development

Overall, interest among teachers in accessing training on the 24 evidence-based practices was moderate (overall  $M = 3.33$ ; individual item means ranged from 2.95-3.62; see Table 2). The interventions for which the highest percentage of teachers indicated they were *quite* or *very* interested in participating in training were computer-aided instruction (58.8%), functional communication training (57.7%), antecedent-based interventions (56.6%), self-management (55.8%), and pivotal response training (52.2%). *No* or *little* interest was most often reported for speech-generating devices (39.8%), Picture Exchange Communication System (PECS; 38.7%), visual supports (37.6%), time delay (32.8%), and discrete trial training (29.6%). In terms of other topics, teachers were most interested in inclusive education (55.5% indicated they were *quite* or *very* interested) and least interested in career development (46.0% indicated *no* interest or *little* interest).

Descriptively, overall interest among administrators in having their staff access training on evidence-based practices was slightly higher than teachers (overall  $M = 3.48$ ; individual item means ranged from 3.05-3.81; see Table 2). The interventions for which the highest percentage of administrators indicated they were *quite* or *very* interested in having their staff receive training were antecedent-based interventions (65.7%), reinforcement (60.5%), functional communication training (59.3%), self-management (58.7%), and task analysis (53.5%). Ratings of *no* interest or *little* interest in staff training were highest for speech-generating

devices (31.4%), PECS (27.3%), time delay (26.7%), peer-mediated interventions (24.4%), and visual supports (20.3%). As with teachers, the other topic for which administrators most wanted staff training was inclusive education (54.1% indicated they were *quite* or *very* interested); the least interest was related to career development (36.0% indicated *no* interest or *little* interest).

When asked to select their top three priorities for training, the highest percentage of teachers prioritized training related to self-management (22.3% of teachers ranked in top three priorities), computer-aided instruction (18.1%), and social skills groups (15.5%). However, administrators prioritized training for their staff on functional behavior assessment (23.6% of administrators ranked in top three priorities), self-management (23.0%), and response interruption/redirection (18.6%).

### Relations Among Confidence and Training Interest

For teachers, lower confidence in implementing or addressing a topic was never associated with significantly higher interest in training on that topic (see Table 2). For administrators, however, lower confidence in their staff was associated with significantly higher interest in professional development for 10 of the topics, including 6 evidence-based practices (i.e., antecedent-based interventions, functional behavior assessment, functional communication training, reinforcement, social skills training groups, and task analysis) and four other topics (i.e., characteristics of ASD, inclusive practices, assessment for instructional programming, and special education laws and policies). The unexpected findings of positive correlations among confidence ratings and training interest may be influenced in part by the fact that some topics are less relevant in younger grades, leading respondents to have both low confidence and low interest in training. For example, 18.4% of middle and high school teachers were *quite* or *very* interested in career development compared with only 8.2% of preschool and elementary.

### Relations Among Teacher and Administrator Ratings of Topics

For 24 of the 36 evidence-based practices and training topics, we found no statistically significant differences between teachers and administrators' ratings of confidence. For 2 practices (i.e., prompting, video modeling), teachers' ratings of their own confidence were higher than the ratings administrators expressed for their staff. For the remaining 10 topics (i.e., computer-aided instruction, functional behavior assessment, response interruption/redirection, alternate assessment, ASD diagnostic methods, inclusive practices, assessment for instructional programming, special education laws and

**Table 3.** Teacher and Administrator Ratings of Training Benefits and Likelihood of Access.

Professional development avenues	Teacher ratings (n = 274)					Administrator ratings (n = 172)					ANOVA of teacher/administrator ratings	
	Benefit		Access		r	Benefit		Access		r	Benefit	Access
	M	SD	M	SD		M	SD	M	SD		F(1, 444)	F(1, 444)
On campus college course	2.41	1.32	1.96	1.11	.72**	2.31	1.12	1.97	0.92	.64**	.61	.01
One-to-one coaching or mentoring	3.07	1.25	2.89	1.22	.84**	3.45	1.19	3.16	1.16	.78**	9.87**	5.11*
National conference	2.58	1.34	2.17	1.21	.75**	2.42	1.25	2.00	1.14	.69**	1.44	2.21
Online college course	2.81	1.37	2.58	1.34	.82**	2.66	1.17	2.42	1.09	.76**	1.41	1.56
Printed materials (books, practice guides, etc.)	3.23	1.18	3.32	1.20	.87**	3.19	1.03	3.21	1.09	.78**	.15	1.04
State conference	3.02	1.26	2.78	1.27	.86**	3.19	1.09	2.99	1.15	.80**	2.22	3.11
Teacher study groups	2.90	1.12	2.76	1.13	.85**	2.97	1.08	2.77	1.10	.78**	.35	.00
Summer institute (week long)	3.25	1.28	2.98	1.31	.80**	3.40	1.03	3.05	1.11	.70**	1.54	.34
Webinar (web-based presentation)	3.07	1.21	3.11	1.25	.87**	3.36	1.06	3.36	1.11	.82**	6.70*	4.76*
Website	3.30	1.11	3.38	1.17	.87**	3.35	1.04	3.44	1.11	.84**	.22	.26
Workshop	3.78	0.90	3.46	1.07	.71**	3.73	0.89	3.31	1.02	.68**	.31	2.21

Note.  $r$  = Pearson's product-moment correlation.

\* $p < .05$ . \*\* $p < .01$ .

policies, program evaluation, technological supports/accommodations, transition planning strategies), administrator ratings were significantly higher.

Similarly, somewhat few significant differences were found between teacher and administrator ratings of training interest. Although teacher ratings never exceeded those of administrators, administrators had significantly higher ratings for 10 topics (i.e., antecedent-based interventions, discrete trial training, functional behavior assessment, picture exchange communication system, reinforcement, structured work systems, visual supports, characteristics of ASD, program evaluation, transition planning strategies).

### Factors Associated With Teacher Ratings

In terms of overall ratings of evidence-based practices, special educators expressed more confidence,  $r(272) = .27, p < .001$ , and more interest in training,  $r(272) = .22, p < .001$ , than did general educators. Although teachers with more experience in their current positions tended to be less interested in training on evidence-based practices,  $r(272) = -.186, p < .01$ , they did not have higher ratings of confidence implementing those interventions,  $r(272) = .04, p = .49$ .

### Benefits of Professional Development Avenues

Overall, teachers reported they were only somewhat likely to benefit from various professional development avenues included on the survey (item means ranged from 2.41-3.78;

see Table 3). The avenues of training for which the highest percentage of teachers indicated they would *quite likely* or *very likely* benefit from accessing were workshops (64.2%), week-long summer institutes (47.1%), websites (41.6%), printed materials (40.9%), and state conferences (37.2%). The training avenues for which the highest percentage of teachers said they were *not at all* or only *a little* likely to benefit from accessing were on-campus college course (55.1%), national conferences (47.4%), online college courses (40.5%), study groups (33.2%), and coaching (32.5%).

Administrator ratings were also modest (item means ranged from 2.31-3.37). The avenues of training for which the highest percentage of administrators perceived their staff would *quite likely* or *very likely* benefit from accessing were workshops (61.6%), coaching (48.8%), summer institutes (47.7%), webinars (44.2%), and websites (41.9%). The highest percentage of administrators indicated their staff were *not at all* or only *a little* likely to benefit from accessing the following training avenues: on-campus college course (61.0%), national conference (51.7%), online college course (45.3%), study groups (34.3%), and state conference (27.3%).

### Accessing Professional Development Avenues

Teachers generally reported being only somewhat likely to access most professional development avenues in the next year (item means ranged from 1.96-3.46; see Table 3). The avenues of training for which the highest percentage of

teachers indicated they were *quite likely* or *very likely* to access this year were workshops (51.8%), printed materials (47.1%), websites (47.1%), summer institutes (39.4%), and webinars (39.1%). They were *not at all* likely or *only a little* likely to access on-campus college courses (70.8%), national conferences (65.7%), online college courses (48.9%), state conferences (40.1%), and coaching (39.4%).

For most avenues, administrators had fairly low expectations regarding the likelihood their staff would attend trainings. The highest percentage of administrators indicated their staff would be *quite* or *very likely* to access websites (47.7%), webinars (45.3%), workshops (43.0%), printed materials (41.3%), and coaching (38.4%) in the next year. They reported their staff were *not at all* or *a little* likely to access on-campus college courses (75.6%), national conferences (69.2%), online college courses (54.7%), study groups (41.3%), and state conferences (39.0%).

### Relations Among Teacher and Administrator Views of Professional Development

For 9 of the 11 avenues of training, ratings of potential benefit and the likelihood teachers would access an avenue of training did not differ between teachers and administrators. Administrator rated one-to-one mentoring or coaching as more beneficial,  $F(1, 444) = 9.87$ ;  $p < .01$ , and indicated teachers would be more likely to access this type of training relative to teacher ratings,  $F(1, 444) = 5.11$ ;  $p = .02$ . Similarly, administrators rated webinars as more beneficial,  $F(1, 444) = 6.70$ ;  $p = .01$ , and more likely to be accessed compared with teachers,  $F(1, 444) = 4.76$ ;  $p = .03$ .

*Relationship between perceived benefit and likelihood to access.* For both teachers and administrators, ratings of the potential benefit were significantly associated with their interest in every avenue of training,  $r = .64$  to  $.87$ ; for all relationships, see Table 3.

### Moderators of Teacher Perspectives on Interest in Training

*Geographic region.* Relative to teachers from other geographic regions, teachers and administrators from urban areas expressed significantly more interest in accessing national conferences,  $r(444) = .24$ ,  $p < .001$ , online college courses,  $r(444) = .15$ ,  $p = .001$ , on-campus college courses,  $r(444) = .15$ ,  $p = .001$ , state conferences,  $r(444) = .12$ ,  $p < .01$ , and week-long summer institutes  $r(444) = .11$ ,  $p < .02$ . Descriptively, teachers from urban areas expressed more interest in all avenues of training relative to the mean,  $r(444) = .02$  to  $.24$ . Teachers from rural areas (combined rural metropolitan and non-metropolitan census area) expressed significantly less interest in attending national conferences,  $r(444) = .11$ ,  $p = .02$ . Descriptively, teachers

from rural areas expressed less interest in most (8 of the 11) avenues of training,  $r(444) = -.11$  to  $-.01$ , with the exception of state conferences, webinars, and websites.

## Discussion

Preparing practitioners to implement evidence-based practices confidently and effectively requires strategic professional development. To better understand practitioner perceptions of professional development needs in the state of Tennessee, we surveyed 456 administrators and teachers representing 89 school districts. Specifically, we were interested in gauging practitioner confidence in implementing evidence-based practices and addressing related training topics for school-age children and youth with ASD, determining their interest in accessing training in these areas, and identifying the extent to which practitioners would access various professional development avenues for receiving this training. To date, relatively little is known about the preferred focus and format of efforts to prepare educators to meet the diverse needs of students with ASD. Several of our findings extend the professional development literature in important ways.

First, practitioners were generally not highly confident in their ability to implement and address many evidence-based practices and training topics related to students with ASD. On average, teacher ratings suggested most were *only a little to somewhat* confident in their abilities to implement 15 of the 24 evidence-based practices and 10 of the 11 other training topics. Such findings align with those from a statewide survey in Virginia in which special education teachers self-reported low to intermediate knowledge of skill competencies related to educating students with ASD (Hendricks, 2011). Low ratings of confidence may stem from limited opportunities to acquire information about the implementation of evidence-based practices (Odom, Cox, Brock, & National Professional Development Center, 2013). In the present study, most teachers had not recently accessed ASD-related professional development from the statewide technical assistance center.

Given these findings, modest interest among respondents in accessing additional professional development was surprising. On average, fewer than half of all teachers in this study indicated they were *quite* or *very* interested in accessing professional development related to these evidence-based practices. Contrary to our expectations, teachers who expressed less confidence in implementing a particular evidence-based practice did not express more interest in professional development related to the practice. Such findings may be attributable in part to how practitioners think about educational interventions. Cook, Cook, and Landrum (2013) suggested that for many practitioners, evidence from scientific research alone might not be a compelling reason to adopt and implement a particular practice.

For example, findings from teacher focus groups conducted by Stahmer, Collings, and Palinkas (2005) revealed that many practitioners do not have a clear understanding of what makes a practice evidence-based. Instead, teachers might weigh other factors more heavily in their decisions about which practices to implement, including the feasibility of the practice (Cook, Tankersley, Cook, & Landrum, 2008), the ease with which the practice can be adapted to fit within ongoing classroom routines (Klingner, Boardman, & McMaster, 2013), and/or whether other teachers endorse the practice and attribute implementation to positive outcomes for students (Cook et al., 2013). Alternatively, some descriptive studies suggest that when educators have low views of their own self-efficacy, they may actually be less enthusiastic about pursuing professional development, as they do not envision additional training as a path to more effective teaching (Han & Weiss, 2005; Stein & Wang, 1988). Another possible explanation is that teachers consider some interventions to be more useful and important than others. In a survey of teachers, practitioners, and administrators, Callahan, Hughes, and Ma (2013) found that ratings of social validity varied widely across these 24 evidence-based practices. In addition, it is possible that teachers have sought, and continue to seek, professional development about specific practices they believe are more relevant to their work. They may already feel most confident about implementing these specific practices, but still desire additional training. It is likely a combination of these factors—along with others not measured in this study—might coalesce to explain the patterns of teacher interest in professional development reflected in this study.

Second, we found key differences in the ratings of teachers and administrators that may suggest they hold different priorities for training topics. For nearly all of the topics on our survey (i.e., 32 of 35 topics), administrators expressed higher levels of interest in their staff accessing training than reflected in the ratings of teachers themselves. In particular, administrators in this survey tended to prioritize evidence-based practices used to address problem behaviors, such as functional behavioral assessment and response interruption/redirection. This interest in strategies to address challenging behavior may stem from the nature of administrator roles, which often include responding to and managing crises related to severe behavior problems. In contrast, teachers tended to prioritize instructional practices for targeting functional skills, such as computer-aided instruction or social skill groups.

Third, we found that interest among practitioners in ASD-related training was different for general and special education teachers and was associated with years of experience. As expected, special educators reported greater confidence in their ability to implement evidence-based practices and were more interested in professional development related to autism compared with general educators. This is

not surprising, as the work of special educators focuses centrally on students with disabilities and general educators have many other competing priorities for professional development beyond disability-specific instructional interventions. However, a survey from another state found that similar numbers of general educators and special educators self-reported implementing evidence-based practices for students with ASD (Morrier et al., 2011). Taken together, available research suggests that although general and special educators are both taking steps to implement evidence-based practices for students with ASD, special educators are more confident in their implementation and consider professional development related to ASD to be a higher priority than general educators.

As we expected, educators with more experience teaching students with ASD were less interested in professional development. Contrary to our hypothesis, teachers with more experience did not report greater confidence in their ability to implement evidence-based practices. This finding is similar to that of Ruble, Usher, and McGrew (2011) who found that teachers of students with ASD with more years of experience did not report higher levels of self-efficacy. Factors other than teacher confidence must explain why more experienced teachers are less interested in professional development. One possibility is that particular school districts may tend to offer the same kinds of professional development opportunities over time. Experienced teachers may quickly exhaust opportunities to access new training topics and eventually perceive professional development to be a less productive use of their time.

Fourth, the views of teachers and administrators regarding the relative benefits of various avenues of professional development were not aligned with evidence from the research literature. Specifically, both groups of respondents perceived workshops to be markedly more beneficial than one-to-one coaching or a college course. Yet, a number of experimental studies indicate single-event training workshops have a very limited impact on practitioner behavior (e.g., Brock & Carter, 2013; Hall et al., 2010; Smith et al., 1992). This disconnect may stem in part from the paucity of high-quality professional development avenues accessible to most school staff. Teachers report that workshops are the most readily available venue to access information about evidence-based practices for students with ASD (Morrier et al., 2011). Although one-to-one coaching has been shown to improve the instructional capacity of educators and outcomes for students with ASD (e.g., Howlin, Gordon, Pasco, Wade, & Charman, 2007; Odom et al., 2013), this quality and intensity of professional development is rarely available to most practitioners. Similarly, high-quality college courses in instructional strategies for students with ASD are both scarce and expensive. Less than 15% of teachers report receiving training to implement evidence-based practices for students with ASD from a teacher preparation program

or college coursework (Morrier et al., 2011). Even universities offering ASD-specific training may not emphasize implementation of evidence-based practice. Less than one fourth (21.2%) of universities offering ASD-specific training spend more than six instructional hours addressing the 24 evidence-based practices identified by the National Professional Development Center on Autism Spectrum Disorders (Barnhill et al., 2013). Training is sometimes limited to a single-class session or assigned reading, and is not directly linked to hands-on experiences with students with ASD (Barnhill et al., 2011). The few practitioners who actually experience high-quality hands-on training with one-to-one coaching perceive one-to-one coaching as being more effective than stand-alone workshops (Brock & Carter, 2013; Odom et al., 2013). Without actual exposure to these professional development avenues, teachers and administrators are unlikely to be convinced that these more expensive and time-consuming options are better alternatives to workshops. Indeed, our findings indicate teachers are most likely to continue accessing the avenues of professional development they already perceive to be the most beneficial based on past experience.

Fifth, geographic region was associated with teacher interest in different avenues of professional development, but in a somewhat different way than we anticipated. As expected, teachers from rural areas were less interested in avenues of training requiring them to travel long distances (e.g., on-campus college course; national conference), but they were also less interested in avenues of training that required little or no travel (e.g., online college course; printed materials) relative to teachers from other geographic regions. Although the underlying reasons for these differences are unclear, it is apparent that interest in different avenues of professional development can be varied within even a single state. For technical assistance providers and other entities charged with providing professional development in states serving geographically diverse communities, it may be instructive to reflect on whether and how professional development opportunities may need to be adapted to meet varied preferences.

### *Implications for Practice*

Findings from this study have implications for administrators, universities, technical assistance providers, and policy makers who make decisions about the design and delivery of professional development related to educating students with ASD. First, professional development related to serving students with ASD is sorely needed. Although such a statement could perhaps be made about serving many other subgroups of students, the relatively low confidence among teachers for implementing and addressing evidence-based practices and related topics coupled with the rise in numbers of students with ASD served in schools makes this a

particularly pressing area of need. Second, consideration of ASD-related training needs should occur at the local level. Our findings suggest professional development needs and interests may not be uniform across a state. In light of the high variability we found across teachers, it is prudent to ask teachers within a particular school or district how they view their own instructional capacities and which different professional development opportunities they would most highly prioritize.

Third, teachers and administrators should carefully examine professional development priorities by considering (a) current skill levels of practitioners and (b) how different evidence-based practices might help meet the needs of specific students. Our survey findings suggest the professional development interests of teachers may be unrelated to how they perceive their own confidence in implementing evidence-based practice and addressing related training topics. Therefore, it remains unclear exactly what factors they consider when prioritizing professional development topics. Also, administrators may be more likely to focus on practices that address problem behavior even though teachers are more interested in everyday instructional strategies to target functional skills. Professional development topics should not be selected based on personal preference, but rather should be strategically chosen to enhance practitioner skills and improve student outcomes. However, it may be appropriate to consider teacher preference in some cases. Johnson and colleagues (2013) found that allowing teachers to choose between training topics, even when the choices are limited to two evidence-based interventions that address the same student outcome, may contribute to faster adoption of the practice and higher quality of implementation.

Fourth, both administrators and teachers should learn about high-quality alternatives to single-event training workshops. One-to-one coaching and mentoring is a promising professional development practice that has been shown to improve teaching and student outcomes (Wilson, Dykstra, Watson, Boyd, & Crais, 2012). Development and evaluation of other innovative approaches are also needed to expand the repertoire of available professional development pathways.

### *Limitations and Future Research*

Several limitations to this study raise possibilities for future research. First, our statewide professional development needs assessment drew only on the perceptions of practitioners and administrators, which may or may not align well with more objective measures of training needs. Future studies should incorporate observational data to document how well teachers actually implement these practices in the classroom and how such practices impact student outcomes. Second, while our survey captured a diverse sample of teachers and administrators across the state of Tennessee,

we did not obtain a random sample. Third, although we obtained data from both administrators and teachers across the state, we were not able to align the ratings of administrators with those of teachers who worked in the same school or district. Exploring the alignment of administrator and teacher views on professional development needs would be enhanced by directly comparing responses from the same school teams. Fourth, our intention was not to collect nationally representative data, but rather to identify training needs specific to the state of Tennessee. Although we recommend other states draw on these findings as they seek to pinpoint their own professional development priorities, we also stress the importance of replicating these findings in their own state.

## Conclusion

Professional development on evidence-based practice for students with ASD is a critical need. This study highlights a concerning gap between research and practice. Although practitioners indicate they are not very confident implementing evidence-based practices, their interest in pursuing professional development related to these strategies is underwhelming. Furthermore, practitioners perceive stand-alone training workshops as the most effective avenue of professional development, despite mounting empirical evidence to the contrary. Needs assessments are only a first step in understanding practitioner views on these issues. Leaders in special education must take additional steps to educate practitioners about evidence-based practice and provide high-quality avenues of professional development that have the potential to improve educational outcomes for students with ASD.

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