Impact of Online Training Videos on the Implementation of Mand Training by Three Elementary School Paraprofessionals

Emaley B. McCulloch
Autism Training Solutions

Mary Jo Noonan
University of Hawaii at Manoa

Abstract: With the number of students with autism and related developmental disabilities increasing and a lack of trained professionals, solutions are needed to provide training on a large scale. Alternative training approaches need to be developed so that paraprofessionals can access training in an efficient and effective way. One such possibility is online training. A multiple baseline design across participants was used to evaluate the impact of online training videos (OTV) on the implementation of mand training with three paraprofessionals in a public school setting. The three paraprofessionals were of Hawaiian ancestry, ages 32, 34, and 42 years. Three elementary aged students with autism and developmental disabilities also participated in the study. They were ages, 6, 8, and 10 years, and also of Hawaiian ancestry. All participants lived in a rural area of Hawaii. After the OTVs, the percentage of correct implementation of mand training increased for all paraprofessional participants and maintained over time. Improvements in accurate teaching were also accompanied by increases in the rate of spontaneous manding by the students. Results support the use of online training as an effective alternative to inservice training for paraprofessionals.

The number of children diagnosed with autism spectrum disorders (ASD) served under the Individuals with Disabilities Education Act (IDEA) has increased by more than 500% in the last decade (United States Government Accountability Office, 2005). Over the past 20 years, there has been an increase of 123% in the number of paraprofessionals employed in the educational system to help meet that need (Legislative Review & Investigations Committee 2006). Unfortunately, the number of students with disabilities served under IDEA is growing at a greater rate than the growth of trained staff (United States Department of Education, 2000).

Many of the services provided to students with ASD in public schools are delivered by paraprofessionals. Despite this fact, a scarcity of research exists evaluating the effectiveness of paraprofessionals in improving outcomes for children with disabilities, including stu-

dents with ASD (Marks, Schrader, & Levine, 1999; Young, Simpson, Myles, & Kamps, 1997). Many paraprofessionals are not adequately trained in evidence-based interventions to support children with disabilities. Rural areas experience increased challenges in providing training opportunities for paraprofessionals (Pickett & Gerlach, 2003). When training is available, it's usually unstructured and not competency based (Pickett & Gerlach, 2003).

The methods of applied behavior analysis (ABA) have been demonstrated to have positive effects in teaching individuals with disabilities over the last 40 years (Eldevik et al., 2009; Howard, Sparkman, Cohen, Green, & Stanislaw, 2005). In 2010, the National Autism Center conducted the National Standards Project and produced a set of standards for effective, research-validated education and behavioral intervention for children with ASD. The overwhelming majority of established interventions identified was developed in the behavioral literature and demonstrated the application of ABA procedures.

An important aspect of ABA interventions is the implementation of mand training procedures. Mand training is a technique used to

Correspondence concerning this article should be addressed to Emaley McCulloch, 2800 Woodlawn Dr., #175, Honolulu, HI 96822. E-mail: emaley@autismtrainingsolutions.com

teach individuals functional communication. Teaching mands (requests) is a pivotal goal in most treatment plans for students with autism (Sundberg & Michael, 2001). Teaching students to mand for items/activities has many benefits. For students with autism and related disabilities, mand training has been effective in decreasing problem behaviors such as self injury and aggression (Carr & Durand, 1985; Winborn, Wacker, Richman, Asmus, & Geier, 2002), increasing vocabulary and spontaneous speech (Arntzen & Almas, 2002; Knapczyk, 1989), and increasing social interactions with parents, teachers, and peers (Sundberg, Loeb, Hale, & Eigenheer, 2002). A limited number staff trained in implementing ABA and/or mand training may result in limited opportunities for learning valuable communication and social skills (Lerman, Vorndran, Addison, & Kuhn, 2004).

Research has demonstrated ways to successfully train staff in mand training procedures. Laski, Charlop, and Schreibman (1988) demonstrated that discussion, modeling, and in-vivo coaching was effective in promoting mand training among staff and parents, however, lengthy instructions were required. In 2010, Nigro-Bruzzi and Sturmy used behavioral skills training (BST) to train staff to implement mand training with students with autism. The training consisted of 30 to 60 min sessions of instructions, video modeling, role-play rehearsal, and performance feedback. Training resulted in increases in staff performance in mand training and in unprompted mands by children. Although effective, each trainee required one-to-one time with an experienced behavior analyst, which may not be possible in many situations.

Online training in ABA principles, including video demonstrations of procedures being implemented, might be one solution to overcoming the barriers associated with paraprofessional training and professional development. Online training and education has been found to be effective in many disciplines, including business, health care, computer science, and medicine (Ruiz, Mintzer, & Leipzig, 2006; U.S. Department of Education, Office of Planning, Evaluation, and Policy Development, 2009). Online training offers learners control over the learning sequence and pace of instruction, allowing them to tailor their experiences to meet their personal learning objectives.

One study investigated the use of an online training tool in the field of ABA and autism. Granpeesheh et al. (2009) examined the effectiveness of an online training tool to teach the academic knowledge of ABA treatment for children with autism with a group of newly hired service providers. This online training presented the information through text, voice-over, and occasional video clips. Performance of participants who received e-learning training was compared to the performance of a group who received traditional classroom training. Results showed knowledge of ABA principles and procedures increased substantially for both groups, suggesting that e-learning can be similarly successful at teaching foundational concepts as traditional classroom training. One question that this study did not address was whether the online training affected the quality of the clinicians' implementation of the principles when actually teaching students. The current research study evaluated the impact of online videos on the direct application of ABA principles in the classroom.

The purpose of this single-subject study was to evaluate the impact of online training videos (OTV) on paraprofessionals' use of mand training procedures with students with ASD and related disabilities within a special education setting. We also examined the impact of the online training on the students' frequency of mands (requests).

Method

Setting and Participants

The setting for this study was a special education classroom on a public elementary school campus in a rural part of Hawaii. A special education teacher supervised the classroom, including five educational aids/paraprofessionals. The classroom had nine students (ages 6 to 10 years) coming and going throughout the day. There were two large tables for group instruction and six partitioned desks for one-to-one instruction. There was also a computer area, play area with toys and books, and a sensory area with therapy balls and sand/water table.

Staff participants. The three participants, Autumn, Rebecca, and Molly were female, of Hawaiian ancestry, and ages 26, 34, and 46 years, respectively. Rebecca and Molly had a high school diploma and Autumn had bachelor's degree in business. None of the participants had had any previous training in ABA or mand procedures. Each participant worked one-to-one with a student who attended at least part-day in the special education classroom.

Student participants. Three elementary special education students participated in the study. All student participants had goals on their individualized education plan (IEP) that specifically focused on increasing requests/mands. Ezra was a 6-year-old boy with autism and of Hawaiian ancestry. Ezra participated part-day in a special education first grade classroom with supports. Although Ezra used sentences to communicate, he engaged in limited mands with teachers and peers. Ezra also had problem behaviors that included running away, task refusal, and hitting others. Autumn worked with Ezra.

Adam was an 8-year-old boy with developmental delays who was of Hawaiian ancestry. Adam also spent part of his day in a special education classroom. He demonstrated moderately good social skills with adults and peers. He had language delays and unintelligible speech. Molly worked with Adam.

Maile, a 10-year-old girl with developmental delays who was of Hawaiian ancestry, participated part-day in a special education classroom. Although Maile used speech to communicate, her language was delayed, she used short phrases, and her speech was difficult for others to understand. Rebecca worked with Maile.

Paraprofessional Behavior Definitions

Implementation of mand training procedures by the paraprofessionals was operationally defined as the participants' application of the following component skills with his or her student:

1. "Sanitize" the environment: The paraprofessional blocks access to or removes motivating items/activities, keeping them out of reach while leaving these items or activities in view for the student to see.
2. Prompt/require mand: The paraprofessional requires a mand or provides a prompt for a mand before motivation decreases (i.e., before the student moves away/looks away from the item).
3. Reinforce: The paraprofessional gives the student the desired item/activity within 3 sec of a student's mand.

Student Behavior Definitions

The student's behavior being observed was spontaneous mands. A spontaneous mand was defined as any verbal utterance/word that resulted in obtaining an item/activity.

Observation Procedures and Interobserver Agreement

All sessions were observed in the classroom during one-to-one instruction with the paraprofessional-student participant dyad for 15 min per session. Data were collected alternately for paraprofessional and student using partial interval recording. The 15-min observation was broken into thirty, 30-sec intervals. If a component skill (sanitize the environment, require mand/prompt, or reinforce) for the paraprofessional occurred within the 30-sec interval, the interval for that component skill was scored "yes." If the component skills did not occur within the interval, the interval was scored "no." The percentage of occurrences over total intervals was graphed for all components for the paraprofessional.

Student data were collected using partial interval recording as well. If a spontaneous mand occurred with the 30-sec interval, the interval was scored "yes." If no spontaneous mand(s) occurred within the 30-sec interval, the interval was scored "no." The percentage of occurrences over total intervals was graphed for student percentage of spontaneous mands.

Before the study began, a second observer was trained in data collection methods by reviewing the definitions of the dependent measures and practicing identifying the behavior in prerecorded videos of mand training with nonparticipants. The second observer was a paid research assistant with a Master's degree

TABLE 1

Interobserver Reliability Results for Paraprofessional and Student Participants

Session	Rebecca and Maile		Molly and Adam		Autumn and Ezra	
	Paraprofessional	Student	Paraprofessional	Student	Paraprofessional	Student
4	93	70	83	85		
6	69					
8	69	86	84	80	96	93
11	73	87	73	100	96	
12	78	93			96	87
14	83		82	53	91	80
17	83	100				
19	97	87	73	73	78	80
Average	**81%**	**87%**	**79%**	**78%**	**91%**	**85%**

in Education. The second observer and the researcher practiced data collection with videos until interobserver reliability agreement of 80% or better across three observation sessions was achieved. The second observer independently collected data on the dependent measures 41% of the sessions. For each skill component and spontaneous mands, the observer's records were compared to the first observer's records to determine agreement on the occurrence or nonoccurrence of responses. The total number of agreements plus disagreements was divided by the number of agreements and the quotient was multiplied by 100% to obtain the percentage of interobserver agreement for each session (Kennedy, 2005, p. 114). The second observer independently collected data on the participant and student behavior during 53%, 38%, and 31% of the sessions for Rebecca, Autumn, and Molly, and their students respectively. Interobserver agreement averaged 84% for the paraprofessionals' data and 84% for the students' data across all sessions (see Table 1).

Experimental Design

A multiple baseline design across participants was utilized because the intervention was knowledge-based and could not be reversed. To determine a functional relation between the dependent variable and the independent variable, data were collected on the accuracy of the implementation of mand training and the frequency of mands used by the participat-

ing students during baseline and post-intervention conditions.

Experimental Conditions

Baseline. During baseline, the paraprofessionals were observed working with their students during one-to-one instruction for 15 min each. The participants were told to do what they would normally be doing during that one-to-one time with their student. Typical one-to-one activities during observation times included art activities, math lessons, toy play, and worksheets. Dependent measures of mand training (sanitize the environment, prompt/require mand, and reinforce) and student spontaneous mands were recorded as described above. Baseline sessions continued until there were stable and level data.

Intervention. Once baseline data were stable for the first paraprofessional participant, access to the OTV was given. The OTV intervention consisted of: a) a pretest of 20 questions to determine a baseline of knowledge; b) 18, 2 to 6 min high-definition, documentary-style videos with classroom demonstrations, studio produced voice-over, and supporting graphics and text (Autism Training Solutions, 2010); c) a competency check following each 2 to 6 min video; d) a post-test (identical to the pre-test); e) a certificate of completion for participants achieving 88% accuracy on the post-test; f) a return to a specific point in the training program where the participant didn't demonstrate mastery followed by a re-

peat of the post-test; and g) a self-evaluation checklist to self-monitor the use of mand-training procedures during classroom application of mand training (Carbone, Zecchin, & O'Brien, 2009). The videos showed teachers using the methods within classroom settings. They also showed teachers implementing the intervention in several different ways. Teachers were given a timeframe (3–4 days) to complete OTV. Once a participant completed OTV and met criterion (88% accuracy) on an associated post-test, she was directed to download and print a self-management checklist of the mand training procedures. She was told to use this in subsequent classroom teaching sessions to self-evaluate in the application of mand training. These procedures were the same for all participants.

Molly went through the modules twice and was not able to meet criterion on either post-test with 88% accuracy. Although she received a score of 50% on the post test score in *Introduction to Verbal Behavior* and 74% on the post-test of *Mand Training*, the researchers moved her into the post-intervention condition because she had taken the OTV course twice. Autumn met criterion on the post-tests on *Introduction to Verbal Behavior* and *Mand Training* with 95% and 89% accuracy, respectively; and Rebecca passed the post-tests with 89% and 89% accuracy, respectively. Both Autumn and Rebecca took the post-test once. The sessions thereafter were considered post-intervention sessions.

Post-Intervention.   Post-intervention data were collected in the same way that data were collected during baseline. Follow-up sessions were recorded 5 and 8 weeks after the post-intervention condition to see if effects maintained.

Results

Figure 1 presents the percentage of intervals with correct implementation of mand training components pre- and post-training. Rebecca's baseline was somewhat stable with scores of 0%, 23%, and 0% with a mean of 8%. Maile's spontaneous mands in baseline were 0%, 45%, and 0% with mean of 15%. Rebecca completed the OTV in 2 days and reported that she spent about five hours completing the

online training. Immediately after training Rebecca's data jumped from 0% to 42%. Rebecca's data followed an upward trend across all post-training sessions. This was also reflected in her self-evaluation scores that increased from 8% to 100%. There was no immediate effect in Maile's data for spontaneous mands but her data followed an increasing trend with variability ranging from 6% to 73%.

Autumn's baseline scores showed variability with an initial high score of 80% and an immediate decrease to 10% and 0% (see Figure 1). Ezra's spontaneous mands also had an initial high score of 80%, and then dropped to 65% and 0%. Both paraprofessional and student data showed a dramatic downward trend in baseline. Autumn completed the online training across 3 days, 1 day at school and the other 2 at her home over a weekend. She reported that the training took her about three hours. Autumn's score jumped from 0% in baseline to 86% immediately after intervention. Her self-evaluation scores increased from 33% to 69% across post-intervention sessions. After 4 sessions of stable data, there was some variability and decrease in her scores, which subsequently increased and maintained in follow-up sessions. Ezra's data closely mimicked Autumn's data, with an immediate change from 0% to 93% after intervention. Ezra's data also showed similar variability and inconsistency mirroring Autumn's data, with a final increase to the 90–100% range. Baseline data overlapped with post training data for both paraprofessional and student.

Molly's baseline remained fairly stable with scores between 0%–25% across nine sessions (see Figure 1). Adam's spontaneous mands remained low in baseline ranging from 0–45% with a mean of 18%. Molly participated in the OTV across 6 days during and directly after the school day. Molly reported that the training took her about eight hours because she had to go back and review modules when she didn't meet criterion. She never met the criterion of 88% after viewing the training twice, however, she was advanced to the post-intervention condition of the study. In the post-intervention condition, Molly's data immediately jumped from 18% to 53% (see Figure 1). Subsequent sessions displayed a higher level of performance with a mean of 50% and a subtle increasing trend. Adam's
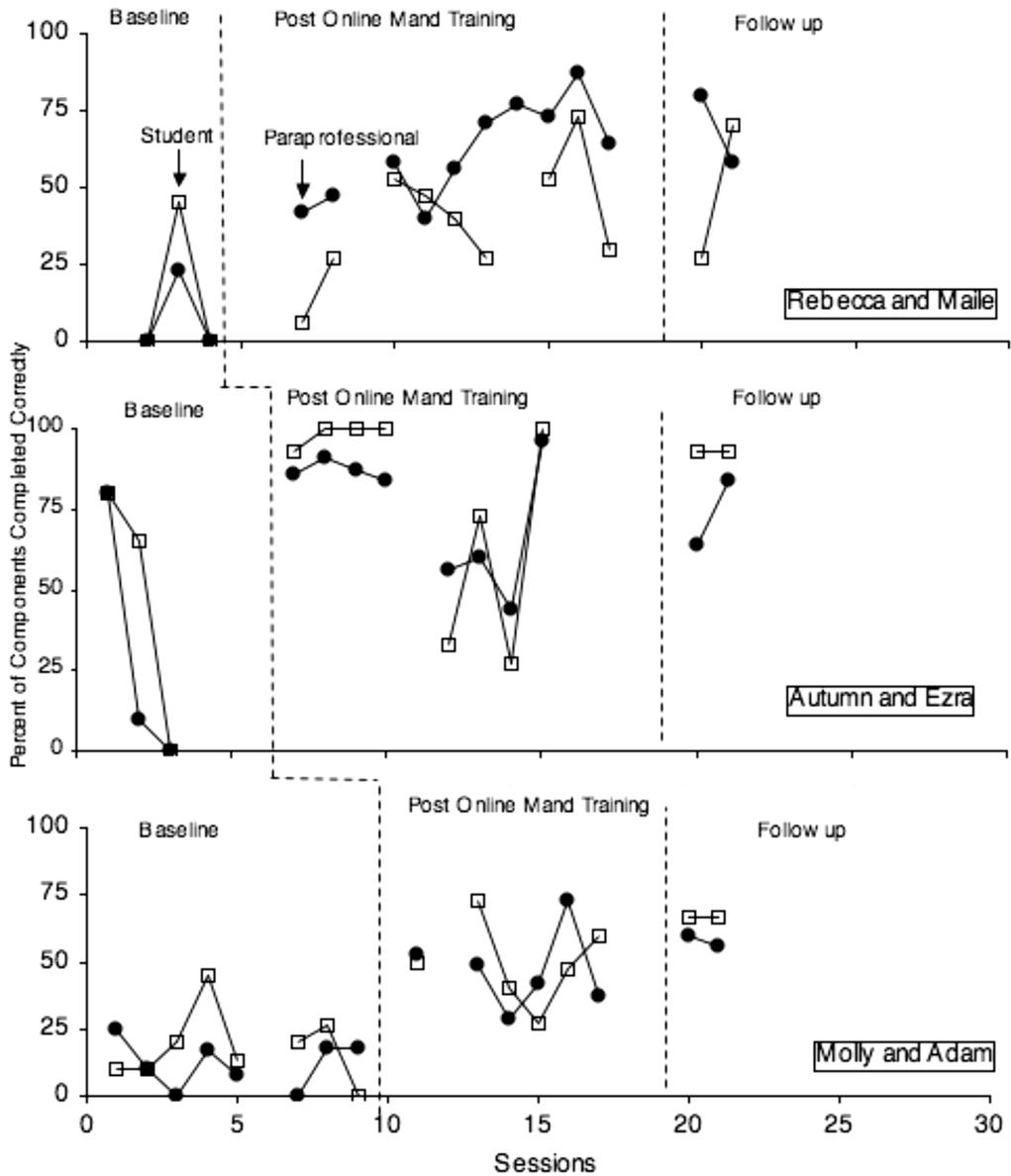
Figure 1. Percentage of Components Completed Correctly for Rebecca (top), Autumn (middle), Molly (bottom) and Spontaneous Mands for Maile (top), Ezra (middle) and Adam (bottom). Breaks in data path indicate teacher or student absence.

manding also immediately jumped from 0% to a 50% and followed a similar level and trend as Molly's data. Adam's post-intervention mean was 54%. Both Molly and Adam's data remained stable into the follow-up session.

Discussion

Overall, OTV combined with the self-management checklist seemed to have functional control over the paraprofessionals' implementation of mand training procedures. OTV

seemed to increase the use of mand training components during observed one-to-one sessions. As a result, the degree to which the paraprofessionals were using mand training procedures seemed to be directly related to the percentage of intervals the students were spontaneously manding. In other words, the students' manding behaviors increased when the paraprofessionals were implementing the components of mand training (sanitizing the environment, prompting/requiring mand, and reinforcing).

Before intervention, Rebecca interacted with Maile by asking her many questions about pictures and objects during one-on-one teaching sessions (What is this? Can you draw with crayons?). Rebecca also gave her a lot of directions ("Show me the big one"). After intervention, Rebecca continued to ask her questions and give directions, but she also started using the components of mand training (sanitizing the environment, prompting/requiring mands before giving items to students, and reinforcing mands immediately). Rebecca reported that after intervention, it took time and practice to implement mand training procedures because she wasn't sure what Maile would be motivated enough to mand for.

Autumn's baseline scores showed variability with an initial high score of 80% and an immediate decrease to 10% and 0%. This initial high score might have been the result of reactivity. For example, before the initial observation, the lead teacher, who had some training in teaching mands, mistakenly told Autumn that she was being observed and should provide opportunities for Ezra to make requests. This may be the cause of the initial high percentage of mands and mand training component skills. She was then told to do what she normally does during that one-to-one instruction time. Subsequent baseline sessions showed a decrease in mands.

After Autumn completed OTV, her implementation scores immediately increased and maintained for 4 sessions and then decreased significantly. On the day both Autumn and Ezra's scores decreased, Autumn and the classroom teacher reported that due to an issue in the home, Ezra was not responding to instruction, and participating less in activities that he normally enjoyed. During sessions 9

and 10, Ezra engaged in several tantrums. It's important to note that Autumn and the other paraprofessionals hadn't had any training in behavior management. Thus when Ezra's problem behaviors increased, Autumn may not have been able to implement mand training effectively. Unfortunately, stable data were not achieved in the post-intervention phase.

Molly viewed the trainings two times and wasn't able to meet the criterion of 88% accuracy. She consistently missed the same components of mand training, which were to prompt the mand and immediately reinforce. The change in level of data was mostly due to her increased ability to sanitize the environment. This one step of mand training was able to make a significant difference in implementation and Adam's number of spontaneous mands. Adam's mands closely mimicked Molly's data, suggesting a relationship between the mand training and spontaneous mands.

Limitations

The first limitation is that individuals who don't have experience using online technologies may be resistant to adopting this method of training. One of our initial participants, who was in her sixties and had little experience with computers, dropped out of the study once the online training was introduced to her. She had difficulty navigating and logging into the system and reported that the training was "stressful" for her. Another limitation that was uncovered was the school's inability to provide time to complete the training. Participants had to complete the training outside of worktime. The school system also did not provide any incentives for the paraprofessionals to complete trainings or increase their skills. The classroom teacher expressed interest in continuing to use online staff training, but even when the training was offered free of charge, he wasn't sure how to get the staff to complete training without compensation. If online trainings are adopted in the schools, schools may need to reallocate some of the cost-savings into providing incentives for the paraprofessionals to complete trainings on their own time.

A theoretical limitation is that there is a lack of literature that provides examples of an operational definition for a mand. One of the

defining characteristics of a mand is that there must be a motivation or motivating operation present before the verbal behavior occurs (Sundberg, Loeb, Hale & Eigenheer, 2002). Since motivation is not easily observed, it was not part of this study's operational definition of a mand. After reexamination, more careful consideration of including an operational definition of motivation may be needed in future studies of mands. Students may evoke mands but not access to the item or activity they requested. In turn, this may have limited the frequency of true mands being recorded.

Recommendations for Future Research

One of the limitations of greatest significance within this study was the degree to which the findings can be generalized. External validity will need to be addressed in future studies. Because the study was a single-subject, multiple baseline design across participants design, this study suggests that OTV was effective for the paraprofessionals who participated in the study. Additional replication studies should be conducted to determine if there would be similar results with other populations. Other topics related to the outcomes of professional development and the outcomes of student learning as a direct result should be investigated.

The intervention in this study was a treatment package and did not include a component analysis to determine the effectiveness of OTV without the self-evaluation checklist. Substantial research indicates that self-monitoring/self-evaluation strategies are powerful interventions in their own right (c.f., Allen & Blackston, 2003; Plavnick, Ferreri, & Maupin, 2010; Richman, Riordan, Reiss, Pyles, & Bailey, 1988). It would be useful to know if the results of the study would have been similar without the self-evaluation checklists.

More research is needed across other populations and other teaching methods to assess whether online training is an effective training tool for paraprofessionals. Will paraprofessionals perform better with a blended approach of OTVs and in-vivo coaching? Would paraprofessionals perform better if they had training initially in behavior management before learning teaching procedures? What ratio of online learning and in-vivo coaching is most effective? Would other online technology features, such as social media and forums, increase the effectiveness and positive attitudes of online training?

Conclusions

Although the majority of research indicates that classroom lecture and workshop-style in-service trainings have little impact on paraprofessional performance (Lamb, 1993), schools continue to rely heavily on this method of training. Training methods that have been found to be effective, such as on-the-job coaching, video modeling, and verbal feedback (Van Oorsouw, Petri, Embregts, Bosman & Jahoda, 2009) are difficult for schools to implement due to lack of resources and available trainers (Lerman, Vorndran, Addison, & Kuhn, 2004). Online training can be offered to teachers and paraprofessionals in a cost-effective and efficient manner outside of the school day. It is self-paced and customized to meet individuals' needs. Consequently; it may be a viable alternative to traditional workshops and inservice training. It also provides paraprofessionals and teachers the foundational knowledge to maximize the time they are able to spend with behavioral specialists who collaborate with them and provide on-the-job coaching. This study is the first study that investigated the application of knowledge gained from online professional development in the field of special education and may set the stage for future research.

In spite of the limitations, online training was shown to be an effective tool in training these paraprofessionals to implement mand training procedures. If the schools that implement online training understand the limitations and provide incentives for the teachers to complete the trainings, online training may offer a more efficient means by which paraprofessionals and teachers can be trained in evidenced-based interventions. While future research is clearly needed in the area, overall, it appears that OTVs, such as the one investigated in this study, have great potential.

References

Allen, S. J., & Blackston, A. R. (2003). Training preservice teachers in collaborative problem solv-

ing: An investigation of the impact on teacher and student behavior change in real-world settings. *School Psychology Quarterly, 18*, 22–51.

Arntzen, E., & Almas, I. K. (2002). Effects of mand-tact verses tact-only training on the acquisition of tacts. *Journal of Applied Behavior Analysis, 35*, 419–422.

Autism Training Solutions (Version 1.0) (online learning management system). Honolulu HI

Carbone, V, J., Zecchin, G., & O'Brien, L. (2009) Vocal Manding Evaluation Form. Retrieved from http://www.drcarbone.net/pdf/TeachingMandsVocal.pdf

Carr, E. G., & Durand, V. M. (1985). Reducing behavior problems through functional communication training. *Journal of Applied Behavior Analysis, 18*, 111–126.

Eldevik, S., Hastings, R. P., Hughes, J. C., Jahr, E., Eikeseth, S., & Cross, S. (2009). Meta-analysis of early intensive behavioral intervention for children with autism. *Journal of Clinical Child & Adolescent Psychology, 38*, 439–450.

Granpeesheh, D., Tarbox, J., Dixon, D. R., Peters, C. A., Thompson, K., & Kenzer, A. (2009). Evaluation of an eLearning tool for training behavioral therapists in academic knowledge of applied behavior analysis. *Research in Autism Spectrum Disorders.* doi: 10.1016/j.rasd.2009.07.004

Howard, J. S., Sparkman, C. R., Cohen, H. G., Green, G., & Stanislaw, H. (2005). A comparison of intensive behavior analytic and eclectic treatments for young children with autism. *Research in Developmental Disabilities, 26*, 359–383.

Kennedy, C. H. (2005). *Single-case designs for educational research.* Upper Saddle River, NJ: Pearson.

Knapczyk, D. R. (1989). Generalization of student question asking from special class to regular class settings. *Journal of Applied Behavior Analysis, 22*, 77–83.

Lamb, M. (1993). The Consequences of INSET. *Oxford Journals, 49*(1), 72–80.

Laski, K. E., Charlop, M. H., & Schreibman, L. (1988). Training parents to use the natural language paradigm to increase their autistic children's speech. *Journal of Applied Behavior Analysis, 21*, 391–400.

Legislative Review & Investigations Committee. (2006). School paraprofessionals. *General Assembly.* Retrieved October 13, 2011 from *http://www.cilu.org/Docs/School_Paraprofessionals_ %20Briefing_Report.pdf*

Lerman, D. C., Vorndran, C. M., Addison, L., & Kuhn, S. C. (2004). Preparing teachers in evidence-based practices for young children with autism. *School Psychology Review, 33*, 510–526.

Loiacono, V., & Allen, B. (2008). Are special education teachers prepared to teach the increasing number of students diagnosed with autism? *Journal of Special Education, 2*, 120–127.

Marks, S. U., Schrader, C., & Levine, M. (1999). Paraeducators experiences in inclusive settings: Helping, hovering, or holding their own? *Exceptional Children, 65*, 315–328.

Nigro-Bruzzi, D., & Sturmey, P. (2010). The effects of behavioral skills training on mand training by staff and unprompted vocal mands by children. *Journal of Applied Behavior Analysis, 43*, 757–761.

Plavnick, J. B., Ferreri, S. J., & Maupin, A. N. (2010). The effects of self-monitoring on the procedural integrity of a behavioral intervention for young children with developmental disabilities. *Journal of Applied Behavior Analysis, 43*, 315–320.

Pickett, A. L., & Gerlach, K. (Eds.). (2003). *Supervising paraeducators in educational settings: A team approach* (2nd ed.). Austin: PRO-ED.

Richman, G. S., Riordan, M. R., Reiss, M. L., Pyles, D. M., & Bailey, J. S. (1988). The effects of self-monitoring and supervisor feedback on staff performance in a residential setting. *Journal of Applied Behavior Analysis, 21*, 401–409.

Ruiz, J. D., Mintzer, M. J., & Leipzig, R. M. (2006). The impact of e-learning in medical education. *Academic Medicine, 81*, 207–212.

Sundberg, M. L., & Michael, J. (2001). The benefit of Skinner's analysis of verbal behavior for children with autism. *Behavior Modification, 25*, 698–724.

Sundberg, M. L., Loeb, M., Hale, L., & Eigenheer, P. (2002). Contriving establishing operations to teach mands for information, *The Analysis of Verbal Behavior, 18*, 15–29.

United States Department of Education. (2000). *Executive Summary–Twenty-Second Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act.* Retrieved October 27, 2006, from http://www.ed.gov/about/reports/annual/osep/2000/preface.doc

U.S. Department of Education, Office of Planning, Evaluation, and Policy Development. (2009). *Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies.* Retrieved from www.ed.gov/about/offices/list/opepd/ppss/reports.html.

United States Government Accountability Office. (2005). Special education: Children with autism. *Report to the Chairman and Ranking Minority Member, Subcommittee on Human Rights and Wellness, and Committee on Government Reform, House of Representatives.* Retrieved February 23, 2005, from http://www.gao.gov/new.items/d05220.pdf

Van Oorsouw, W. M., Embregts, P. J., Bosman, A. M., & Jahoda, A. (2009). Training staff serving clients with intellectual disabilities: A meta-analysis of aspects determining effectiveness. *Research in Developmental Disabilities, 30*, 503–511.

Winborn, L., Wacker, D. P., Richman, D. M., Asmus, J., & Geier, D. (2002). Assessment of mand selection for functional communication training packages. *Journal of Applied Behavior Analysis, 35,* 295–298.

Young, B., Simpson, R. L., Myles, B. S., & Kamps, D. M. (1997). An examination of paraprofessional involvement in supporting inclusion of students of autism. *Focus on Autism and Other Developmental Disabilities, 12,* 31–38.