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## Online Training to Improve Job Coaches' Support of Minimally Verbal and Nonverbal Adults With Autism Spectrum Disorder

Erin Brooker Lozott

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Online Training to Improve Job Coaches' Support of Minimally Verbal and Nonverbal  
Adults With Autism Spectrum Disorder

by  
Erin Brooker Lozott

An Applied Dissertation Submitted to the  
Abraham S. Fischler College of Education  
and School of Criminal Justice in Partial  
Fulfillment of the Requirements for the  
Degree of Doctor of Education

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2021

## **Approval Page**

This applied dissertation was submitted by Erin Brooker Lozott under the direction of the persons listed below. It was submitted to the Abraham S. Fischler College of Education and School of Criminal Justice and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova Southeastern University.

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## Statement of Original Work

I declare the following:

I have read the Code of Student Conduct and Academic Responsibility as described in the *Student Handbook* of Nova Southeastern University. This applied dissertation represents my original work, except where I have acknowledged the ideas, words, or material of other authors.

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Erin Brooker Lozott

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June 11, 2021

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## **Abstract**

Online Training to Improve Job Coaches' Support of Minimally Verbal and Nonverbal Adults With Autism Spectrum Disorder. Erin Brooker Lozott, 2021: Applied Dissertation, Nova Southeastern University, Abraham S. Fischler College of Education and School of Criminal Justice. Keywords: autism spectrum disorder, job coaches, behavior skills training, self-efficacy, augmentative and alternative communication

Although a sizeable percentage of individuals with autism spectrum disorder (ASD) are minimally verbal or nonverbal, there is limited research on how to best support these individuals in employment settings. Job coaches working with this population should receive specialized training in evidence-based practices (EBP) for ASD to ensure optimal outcomes. This study describes the development, implementation, and evaluation of an online training program for job coaches focused on a behavior skills training approach supporting the use of augmentative and alternative communication. Twenty-two job coaches completed the study. Pre- and posttraining measures were used to evaluate knowledge, self-efficacy, and belief systems using a knowledge assessment based on the content of the training, the Usage Rating Profile-Intervention Revised for Job Coaches, and the Evidence-Based Practice Attitude Scale-36, respectively. Findings revealed an increase in knowledge and self-efficacy and a positive association between self-efficacy and belief in the use of EBPs optimizing the potential for adults with ASD to be successful in employment. These findings extend the limited evidence currently available on how best to provide job coaches training in a manner that fosters effective job performance while integrating EBPs for ASD.

## Table of Contents

	Page
Chapter 1: Introduction .....	1
Statement of the Problem .....	1
Setting of the Study .....	9
Researcher's Role .....	9
Purpose of the Study .....	9
Definition of Terms .....	10
Chapter 2: Literature Review .....	12
Employment Outcomes for Adults With ASD .....	12
Barriers to Success in Employment .....	18
Facilitators of Success in Employment .....	19
Supported Employment: Vocational Training Experiences and Resources .....	21
BST and Employment .....	27
Perceptions of Employment Support Services .....	30
Belief Systems and the Impact on Employment Success .....	31
PD .....	35
AAC in Employment .....	44
Theoretical Framework .....	50
Research Questions .....	53
Chapter 3: Methodology .....	55
Participants .....	55
Instruments .....	57
Procedures .....	60
Chapter 4: Results .....	72
Phase 1: Recruitment and Selection .....	73
Phase 2: Preparation and Implementation .....	74
Phase 3: Analysis .....	78
Data Analysis .....	80
Conclusion .....	87
Chapter 5: Discussion .....	88
Overview of the Study .....	88
Summary of Findings .....	89
Interpretation of Findings .....	90
Context of Findings .....	92
Implications of Findings .....	94
Limitations of the Study .....	96
Future Research Directions .....	97
References .....	99

## Appendices

A	Knowledge Assessment .....	114
B	Expert Reviewer Feedback Form .....	124
C	Permission to Use the URP-IR .....	131
D	URPI-IR for Job Coaches .....	133

## Tables

1	Characteristics of the Job Coach Sample ( $N = 22$ ) .....	79
2	Paired-Samples $t$ Test of Knowledge Pre- and Posttest ( $N = 22$ ) .....	81
3	Cronbach's Alpha Test .....	82
4	Wilcoxon Signed-Ranks Test for Change in Self-Efficacy .....	83
5	Wilcoxon Signed-Ranks Test for Change in Beliefs .....	84
6	Regression Models for Self-Efficacy and Beliefs Based on Change in Knowledge.....	86
7	Correlation Among Variables of Interest.....	86

## Figures

1	Pretest to Posttest Knowledge Scores .....	81
2	Pretest to Posttest Scores on Self-Efficacy Measure .....	84
3	Pretest to Posttest Scores on Beliefs Measure .....	85



## **Chapter 1: Introduction**

### **Statement of the Problem**

Autism spectrum disorder (ASD) is a complex neurodevelopmental disorder characterized by impairments with social communication, social interactions, and restrictive and repetitive patterns of behaviors and interests (American Psychiatric Association, 2013). The Centers for Disease Control and Prevention (Baio et al., 2018) reported that 1 in 54 children are known to have ASD in the United States, with over 70,000 youth with ASD turning 18 every year (Shattuck et al., 2020). The increase in prevalence of ASD combined with an aging population with ASD has resulted in the urgent need for interventions and programs specifically tailored to adults transitioning into competitive employment settings, while receiving job coaching through vocational rehabilitation supported employment services (K. A. Anderson et al., 2018).

Vocational rehabilitation is one of the few formal federal-state programs supporting individuals with disabilities in procuring and retaining a job (Florida Department of Education, Division of Vocational Rehabilitation, n.d.). Although vocational rehabilitation services, including supported employment (i.e., support for placement, on-the-job training, stabilization, and transition), are available and have the potential to play a significant role in supporting employment, the services continue to be underutilized, especially by individuals with ASD (Chen et al., 2015).

Services are underutilized for many reasons. Individuals with ASD are often ineligible for vocational rehabilitation services due to the presentation of their disability, which may appear too severe to benefit from services; further, when eligible, the provision of services is often inadequate (Lawer et al., 2009, Scott et al., 2019).

Individuals with ASD have distinctly different vocational needs due to their uneven cognitive and social abilities. These unique needs make it difficult for job coaches to support the development of job-related skills with usual practices. The need for specialized practices to learn job skills creates problems in maintaining stable employment and results in limited work opportunities (Lawer et al., 2009). Further, the cost associated with employment services is a barrier, as employment for those with ASD is highly dependent on specialized job coaching support (Hendricks, 2010; Scott et al., 2019).

Job coaches are not using evidence-based practices (EBPs) for ASD (Wehman et al., 2014). The limited use of EBPs is connected to a lack of training. A lack of training on EBPs for job coaches has been connected to limited funding by vocational rehabilitation to provide professional development (PD). The variability in support needs of individuals with ASD, and the continued lack of evidence on effective employment interventions for adults with ASD, impacts access to EBPs and, therefore, successful vocational-rehabilitation-supported employment services (Chen et al., 2015; Nye-Lengerman, 2017; Roux et al., 2018, 2021).

### ***The Research Problem***

Supported employment is a service for individuals with ASD and other significant disabilities who need ongoing assistance to succeed in paid employment. For the purpose of this study, competitive employment refers to full- or part-time employment earning pay at or above minimum wage. Supported employment services include the provision of job coaches to assist an individual in finding a job, obtaining a job, learning to complete job responsibilities, and maintaining a job (Wehman et al., 2016, 2020).

Job coaches are responsible for customizing jobs tasks and workplace environments, designing individualized communication supports, providing employer training, and providing follow-up services. Employer training is essential to an individual's success and sustainability in employment (Wehman et al., 2016). Supported employment advances work outcomes, abilities, and quality of life for individuals with ASD (Chen et al., 2015; Roux et al., 2013). However, agencies providing supported employment services often hire job coaches with limited clinical experience, education, and competencies for job coaching (Brock et al., 2016; Wehman et al., 2014).

Job coaches who have had training in systematic instructional strategies often struggle to translate their knowledge into practice (Brock et al., 2016). This may result in a shift from a focus on coaching and training the employer to emphasizing direct support to the employee with ASD. Training provided directly to the employee is frequently limited to task completion. As Brock et al. (2016) noted, ill-prepared job coaches often default to completing the employees' work themselves. These methods limit a job coach's ability to build the client's independence and fade support through the fostering of natural supports (Brock et al., 2016; Towery et al., 2014).

Research has shown that roughly 30% of children with ASD are classified as minimally verbal, presenting with a range of expressive abilities from no use of oral language to use of few oral words or phrases (Tager-Flusberg & Kasari, 2013). Whereas some of these children develop additional verbal skills, many remain minimally verbal into adulthood. Limited communication skills often exacerbate the already established difficulties individuals with ASD experience in employment. For some individuals, augmentative and alternative communication (AAC) is recommended to provide access

to communication forms other than oral language. The use of AAC may support a system of communication that is nonverbal or vocal. Systems may be aided and unaided.

Unaided communication systems capitalize on gestures or manual signs, therefore not using any materials or technology. Aided communication systems range from low-tech methods (e.g., exchanging objects or pictures) to high-tech speech-generating devices and applications embedded within other devices, cell phones, or tablets (Steinbrenner et al., 2020). The use of AAC is frequently recommended for individuals with ASD who are minimally verbal or nonverbal. Access to communication increases opportunities for meaningful participation in employment (Holyfield et al., 2017; Richardson et al., 2019).

Job coaches who support adults with ASD who are minimally verbal or nonverbal often lack the knowledge and skills in EBPs for ASD to effectively support these individuals in employment settings (Brock et al., 2016). A lack of knowledge and skills by a provider directly impacts the individual's ability to fully participate in paid employment opportunities (McNaughton et al., 2018). Limited education and training also impact perceived self-efficacy of coaches. Self-efficacy refers to the beliefs one has in one's ability to successfully perform a task or handle a given situation (Bandura, 1986, 1997).

The level and strength of self-efficacy impact one's confidence, motivation, and attitude. Attitude in this context refers to one's interest in making expected changes when new expectations and demands occur on the job. Increased levels of self-efficacy often result in positive attitudes, persistence in learning complex tasks, performance on tasks, and more significant professional commitment to work (Bandura, 1986, 1997; Love et al.,

2019; Schwoerer & May, 1996; Wangsgard & Cardon, 2018). In the context of job coaches supporting individuals with ASD, self-efficacy will help coaches make the effort to surmount perceived limitations. Job coaches presenting with a positive attitude will be more likely to support an adult with ASD from a strength- versus deficit-based approach. Addressing support needs from a strength-based approach presumes potential. Job coaches who presume potential may be more willing to learn and persist at using new and more complex teaching strategies for success.

Training programs focused on teaching job coaches how to effectively understand and use EBPs for supporting individuals with ASD who are minimally or nonverbal in employment are, therefore, essential (Brock et al., 2016). To address this gap in the literature, this study was designed to create an online training on evidence-based teaching practices for ASD. Specifically, this particular professional training was designed to support the knowledge and self-efficacy of job coaches working with adults with ASD who are minimally verbal or nonverbal across employment settings.

### ***Background and Justification***

Job coaches have training responsibilities both for the adults with ASD they serve and the employers hiring those individuals. Due to traditional staff training being didactic in nature and not always proving to be effective, Parsons et al. (2012) published an EBP guide for practitioners. The protocol they described focused on using behavior skills training (BST) to teach a group of providers how to perform new skills. The six-step process of BST includes instruction, modeling, behavioral rehearsal, and feedback used to teach new behaviors or skills (Parsons et al., 2012). Participants were taught to expand their prompting skills to include the use of most-to-least prompting. Each participant was

assigned to a student who responded to or used manual sign language due to a communication deficit impacting the individual's ability to use verbal language as a primary mode of communication. Most-to-least prompting included five systematic teaching steps: order, reinforcement, error correction, and two prompting methods (Parsons et al., 2012).

Results of the Parsons et al. (2012) study showed the group-based BST program to be effective in teaching prompting and signing skills to professionals working with adults with severe disabilities, including ASD. The use of video models within BST increased the efficiency and consistency of demonstrations. An increase in staff acceptance of training was found when skills taught could be applied immediately within a provider's workplace setting. Overall, Parsons et al. (2012) found effectiveness, efficiency, and staff acceptability to be critical components to creating successful training programs for service providers working with individuals with severe disabilities, including ASD.

Although acceptance of the training was greater when providers could immediately apply skills within the workplace, the cost and feasibility problems with job-embedded training are significant (Parsons et al., 2012). Therefore, researchers need to explore less costly, more convenient training options that align with current funding models (e.g., vocational-rehabilitation-supported employment services, employment services supported by the state Agency for Persons with Disabilities). The use of BST is a practical method when teaching job coaches how best to support minimally verbal and nonverbal adults with ASD in the workforce (Parsons et al., 2012).

Chen et al. (2015) used Rehabilitation Service Administration data to examine the

relationship between vocational rehabilitation services and employment outcomes of individuals with ASD across three age groups. Results showed each age group required different levels of supports and strategies. Findings also indicated vocational-rehabilitation-supported employment to be a viable service option for adults with ASD, across age groups, when the services and supports were specifically tailored to the unique needs of individuals with ASD.

Chen et al. (2015) also highlighted a low number of clients using assistive technology strategies, though multiple software options are available, and the use of visual supports is an EBP for individuals with ASD. Low numbers of clients using assistive technology in the workplace may be due to a lack of awareness by providers. The researchers recommended robust and ongoing continuing education on EBPs in ASD (to include topics related to job-placement services and assistive technology) for job coaches and other direct service professionals working in the field.

Well-trained job coaches are integral to the employment success of adults with ASD and other developmental disabilities. Brock et al. (2016) studied the efficacy of training job coaches to implement evidence-based instructional strategies to teach adults with severe developmental disabilities new vocational skills. The pilot study created a training package including three known teaching methods (step-by-step implementation, modeling, and performance feedback). Brock et al. looked at the effect of the group didactic training paired with hands-on practice or probes using vocational materials and feedback. Findings provided preliminary evidence that a training package including description, modeling, and performance feedback on implementation can support job coaches in using evidence-based instructional strategies, with fidelity, when working with

adults with disabilities in the workforce. Although performance feedback and repeated practice were key factors in creating an effective training process for job coaches, generalization of learned skills was limited. Therefore, supervision of job coaches across settings and skills, paired with performance feedback, was recommended to ensure generalization (Brock et al., 2016).

### ***Deficiencies in the Evidence***

Job coaches clearly require training on how to understand, use, and support the implementation of evidence-based instructional strategies for individuals with ASD, yet limited evidence is available on how best to provide that training in a manner that fosters effective job performance for those with and without complex communication needs (Brock et al., 2016; Wehman et al., 2014, 2020). The limited amount of research on EBPs for adults with ASD may contribute to this problem (Steinbrenner et al., 2020; Wong et al., 2015). Limited research is available on how vocational rehabilitation services correlate with the employment outcomes of adults with ASD (Chen et al., 2015). Due to this narrow body of evidence, researchers have looked to the literature on training of paraprofessionals and teachers as the basis for learning how best to support job coaches working with individuals with ASD (Brock et al., 2016; Towery et al., 2014).

### ***Audience***

The audience for this study includes vocational-rehabilitation-supported job coaches, vocational rehabilitation counselors, and other direct service providers working with minimally verbal and nonverbal adults with ASD in the workforce. A secondary audience includes researchers, as this study was designed to fill a gap in the research on EBPs training job coaches working with adults with ASD.



**Setting of the Study**

The setting of the study was online, as this study was in the format of an online PD training. Job coaches from across the nation participated in this investigation. All data collection also occurred online.

**Researcher's Role**

The researcher's role in this study involved developing and modifying the content of the training, ensuring the content was validated by content-area experts, developing assessment tools, recruiting participants, providing online training, and disseminating pre- and posttraining knowledge assessments and pre- and posttraining self-efficacy surveys. The researcher also analyzed data gathered from all assessments and surveys. The researcher was not a direct supervisor of any of the potential participants. However, the researcher is an administrator in an autism service organization, and six of the 22 participants (27.3%) worked within the organization.

**Purpose of the Study**

The purpose of the study was to advance the field of job coaching by developing an online PD teaching the use of BST (i.e., a prescribed set of EBPs for teaching individuals with ASD) to facilitate communication in the workplace. Content validity of the online training materials will be established through review by content-area experts. Effectiveness of the training in increasing the knowledge base and self-efficacy of job coaches supporting adults with ASD who are minimally verbal or nonverbal across employment settings was determined through pre- and posttraining knowledge and self-efficacy measures.

## Definition of Terms

*Augmentative and alternative communication (AAC)* refers to an area of clinical practice focused on supporting individuals with complex communication disorders to efficiently and effectively engage in a variety of interactions and activities of interest (Beukelman & Light, 2020). The provision of AAC is frequently recommended for individuals with ASD who are minimally verbal or nonverbal. Such aided communication systems range from low-tech systems (e.g., exchanging objects or pictures) to high-tech speech-generating devices and applications embedded within other devices, smart phones, or tablets (Steinbrenner et al., 2020).

*Behavior skills training (BST)* is an evidence-based method for training direct service providers to teach new skills utilizing instruction, modeling, rehearsal, and feedback (Parsons et al., 2012, 2013). For this study, BST refers to the evidence-based approach used by job coaches to support adults with ASD learning job tasks and communication skills across employment settings.

*Job coach* refers to an individual who specializes in supporting individuals with disabilities to get and keep a job. For this study, the term *job coach* is used to describe a professional who utilizes EBPs to assist adults with ASD who are minimally verbal or nonverbal in learning on the job, accurately and independently performing job tasks and responsibilities, and using communication skills in an employment setting. Job coaches provide one-on-one training matching the needs of the employee and employer (Job Accommodation Network, n.d.).

*Knowledge of evidence-based practices (EBPs)* is an understanding of information, facts, concepts, definitions, and principles related to the set of practices that

have apparent positive effects on individuals with ASD. For this study, knowledge of EBP refers to a professional having an understanding of practices with evidence of positive impacts supporting one's ability to make informed decisions and provide high-quality services when assisting adults with ASD in employment settings (American Speech-Language-Hearing Association, n.d.-b).

*Professional development (PD)* is expanding knowledge to learn, gain, or maintain professional continuing education credits towards licensure or certifications. Learning may occur synchronously or asynchronously and occur either in person or through online training, conferences, or coursework (Canaran & Mirici, 2019). For this study, PD refers to prerecorded online training for job coaches focused on EBPs for adults with ASD. Online teacher PD refers to a variety of learning formats, delivered in a web-based fashion to support teachers (Cho & Rathbun, 2013).

*Self-efficacy* is a person's view that they can execute the action needed to produce the desired outcome (Bandura, 1997). In this study, self-efficacy relates to job coaches' perception of how well equipped they are to support employment for an adult with ASD who is minimally verbal or nonverbal.

*Successful employment* is defined as employment matching an employee's interest and skills, lasting at least 12 months, with pay at or above minimum wage, for 20–30 hours of work a week, with opportunities for growth and financial advancement (Able Trust, 2013). This term *successful employment* in this study refers to adults with ASD who are minimally verbal or nonverbal and employed in a job of interest and skill match, with EBPs in place to support their complex communication needs, for at least 12 months with pay at minimum wage or higher.

## **Chapter 2: Literature Review**

This section includes current literature reviewed related to employment for minimally verbal and nonverbal adults with ASD. Literature is reviewed related to the need for job coaches to have increased access to training in EBPs for ASD. Specific areas discussed are (a) employment outcomes for adults with ASD, (b) barriers to and facilitators of success in employment, (c) an overview of the available vocational training and resources accessible through vocational-rehabilitation-supported employment services, (d) BST and employment (e) perceptions of employment-support services among individuals with ASD and their families, (f) components of effective PD, and (g) the use of AAC in employment.

### **Employment Outcomes for Adults With ASD**

Although many young adults with ASD experience difficulties in transitioning to life after high school and accessing postsecondary employment, the particular factors impacting these outcomes have yet to be identified (K. A. Anderson et al., 2018).

Approximately 25% of individuals with ASD are employed, with the preponderance of these individuals having a greater degree of skills and therefore requiring less intensive support (Richardson et al., 2019). The 20%–30% of individuals with ASD who are minimally verbal or nonverbal have more significant challenges in getting and retaining jobs due to the frequent need for specialized supports, such as AAC (Richardson et al., 2019). Most of those able to obtain employment remain underemployed.

Underemployment can refer to being required to work fewer hours than full time, working full time for below standard wages, or being overqualified for positions offered (Ohl et al., 2017). Competitive employment rates are as low as 6%–12% (Holwerda et al.,

2012; Roux et al., 2013) for adults with ASD.

Employment results in increased independence, social status, financial stability, and overall quality of life for individuals, including those with ASD (Chen et al., 2015; Nye-Lengerman, 2017; Roux et al., 2018, 2021). Holwerda et al. (2012) conducted a systematic review of longitudinal studies examining factors supporting or hindering employment in adults with ASD. Due to factors regarding work outcomes only reported as a primary outcome measure in one study, studies focusing mainly on social outcomes, including employment and work outcomes, were reviewed. Participants across studies were adults diagnosed with ASD prior to the age of 18. Out of 17 factors, limited cognitive ability was the only notable predictor of work outcomes (Holwerda et al., 2012).

Although insufficient cognitive ability was the only significant predictor, early development of speech, referred to in this paper as oral language, was closely associated with IQ, and high levels of oral language may contribute to better adult outcomes (Holwerda et al., 2012). Lower IQ was found to contribute to poor adult outcomes. Adult outcomes for AAC users were not addressed. AAC should be considered when thinking about adults with ASD who are minimally verbal or nonverbal in employment, as the provision of AAC may provide a pathway to more positive adult outcomes.

Further findings revealed functional independence to be correlated with employment and outcomes in one study (Holwerda et al., 2012). The availability of support services along with an employer's willingness to hire adults with ASD were addressed as potential factors impacting employment outcomes. Factors related to the qualifications of the job coaches or prior training were not examined (Holwerda et al.,

2012).

Although IQ was the only factor found to be significant, a combination of a factors, including limited language and social communication abilities, behavioral challenges, and the presence of any psychiatric or medical comorbidities, has the potential to negatively impact participation in employment (Holwerda et al., 2012, Pfeiffer et al., 2017; Roux et al., 2013). These results highlighted the need for additional research concentrated on employment as an outcome in adults with ASD (Holwerda et al., 2012).

Though increasing numbers of individuals with ASD are aging into adulthood, research on this age group continues to be limited (Roux et al., 2013, 2018; Sansosti et al., 2017). , Roux et al. (2013) studied postsecondary employment experiences of young adults with ASD compared to those with other disabilities. Data were collected from Wave 5 of the National Longitudinal Transition Study 2, a nationally representative sample of 620 young adults across disability categories, including ASD, who received special education services during high school. In examining the data, full-time employment rates, wages earned, number of jobs held since high school, and job types were analyzed. Of the participants, 17% did not have the communication skills necessary for a conversation. Findings indicated only 58% of young adults with ASD had worked in paid employment, representing the lowest rate of any disability group (Roux et al., 2018, 2021).

As previously mentioned, young adults with more advanced skills, including conversational abilities, were more likely to obtain employment; however, approximately 20% of the participants lacking conversational skills could still find work (Roux et al.,

2013). This specific conclusion supports the notion that paid employment is attainable for individuals with ASD across levels of functioning and communicative abilities. Among other positive outcomes, individualized employment supports and services, once out of high school, were found to be effective in supporting positive employment outcomes (Roux et al., 2013, 2021).

Research has also shown the employment rates of transition-age students with ASD may improve given job-related support and services through vocational rehabilitation (Roux et al., 2021; Wehman et al., 2020). To explore the relationship between vocational services and employment outcomes for students ages 16–21, same-age nonstudent youth, and young adults with ASD, Roux et al. (2021) analyzed the Rehabilitation Services Administration Case Service Report (RSA-911) data. The primary aim of their review was understanding the differences between employment outcomes of transition-age youth who began receiving vocational rehabilitation services as a secondary student, those out of high school, those not enrolled in a secondary program, and young adults with ASD.

Roux et al. (2021) conducted an analysis of administrative data on 44,094 closed cases of vocational rehabilitation customers with ASD from the Federal Fiscal Year 2015–2017 datasets. Files reviewed included individuals with ASD, employed upon engaging in vocational rehabilitation services, and those requiring supports and strategies above that of other employers to work in paid employment and keep a job. The researchers then analyzed services and employment outcomes related to each person's characteristics, including type and level of disability. Central services of interest included vocational rehabilitation counseling, guidance, job search, job placement, and short-term

on-the-job supports. Employment outcomes were estimated based on employment per the RSA-911 definition and earned weekly wages upon exit of vocational rehabilitation services (Roux et al., 2021).

The association of employment outcomes with those who received vocational rehabilitation services such as counseling, job development, job placement, and on-the-job supports were the same for students, nonstudent youth, and young adults with ASD. These findings align with previous research comparing transition-age youth to young adults with ASD (Chen et al., 2015, Roux et al., 2021). Students who received on-the-job supports and services were approximately 4 times more likely to secure employment than nonstudent youth and young adults. Individual characteristics, including level of support needed due to comorbid disabilities, directly impacted access to vocational rehabilitation, supported employment, and counseling services as well as the attainment of paid work. Those with more significant support needs or more robust disabilities were more likely to receive vocational rehabilitation services but 20% less likely to secure employment than transition-age youth less impacted by their disability (Roux et al., 2021).

Transition age students appear to be the most impacted by a gap in access to vocational rehabilitation services. Based on findings, increasing job-related services to students on the autism spectrum could improve vocational rehabilitation services and employment outcomes. Results further underscored the need for vocational rehabilitation services to be guided by the results of programs created to address the characteristics and needs of individuals on the autism spectrum (Roux et al., 2021).

Though the Roux et al. (2021) study added essential information to the literature, highlighting the impact of student status in relation to the receipt of vocational



rehabilitation services, several limitations were present. The study did not include individuals not eligible for vocational rehabilitation, formally verify diagnoses of ASD, or analyze the impact vocational rehabilitation as an agency (e.g., the provision of job coaching) had on service delivery or employment outcomes. Future research should focus on further defining effective transition practices to support positive employment outcomes for transition-age youth and young adults with ASD (Roux et al., 2021).

Adults with ASD may have a concomitant intellectual disability that impacts their success rates in the workforce. Baldwin et al. (2014) used survey methodology to describe adults with ASD without comorbid cognitive deficits and their work activities and experiences. Participants included 130 working individuals, not in a full-time instructional program. Findings revealed that individuals with ASD who worked often experienced unemployment or underemployment episodes, and many of those employed did not gain support in the workforce.

Underemployment is described as working part time rather than full time, making lower than expected wages, being overqualified for a position, and having developmental needs or interests not well suited to the job (Baldwin et al., 2014; Ohl et al., 2017). Baldwin et al. (2014) found participants frequently experienced fragmented work histories and often obtained unskilled, low-level, and low-paying positions. A work history comprised of lower paying jobs and a lack of preparedness of employers to support adults with ASD in employment directly impacted opportunities for higher paying positions. While reinforcing the known challenges adults with ASD have in securing and maintaining employment, Baldwin et al.'s study directly addressed the need for specialized training of employers and the need for increased access to supported

employment services even for those adults without an intellectual disability. Although the sample size in the study was considered large, its reliance on participant self-selection to enroll and the exclusion of adults with ASD and intellectual disability are considered limitations (Baldwin et al., 2014).

### **Barriers to Success in Employment**

Employment supports and services must be individualized and rooted in EBPs to ensure optimal outcomes in adults with ASD. Pfeiffer et al. (2017) carried out a study with 14 working adults with ASD. Qualitative interviews collected information on the environmental and individual factors influencing work satisfaction and work performance of adults with ASD. Interview questions gathered general information about each participant's job and how the social, attitudinal, and sensory or physical environment impacted each participant's work experiences. Outcomes showed that social interactions, workplace attitudes, and sensory or physical factors were barriers and facilitators of success at work, depending on the support and accommodations provided.

Individual barriers to or facilitators of success were reported to include how well aligned the individual was with the job, the level of motivation and capacity of the person, and the impact symptoms of ASD had on the job. Although the participants were employed, presented with higher level conversational skills, and were comprised of more females than males, the results were compatible with prior research identifying social demands of the environment versus work skills as a hindrance to successful employment (Pfeiffer et al., 2017).

Understanding the needs of transition-aged youth, their families, the practices utilized to promote positive outcomes, and the supports and resources available is

essential to developing individualized programs for adults with ASD. K. A. Anderson et al. (2018) conducted a comprehensive review of qualitative research using a sample of 17 peer-reviewed studies on transition to adulthood in autism. Across the studies, participants were comprised of 121 individuals with ASD, 186 parents or caregivers, and 192 professionals. Of the many findings, limited financial resources, low parent expectations, and limited access to integrated services by professionals trained in ASD were found to contribute to poor outcomes in adulthood. Limited access to postsecondary vocational training was also found to impact the level of independence and adaptive functioning across daily living activities. K. A. Anderson et al. (2018) identified supports as modification to the environment; greater collaboration among professionals; and individualized interventions specific to the unique needs of individuals with ASD across cognitive, social, and communicative support levels. However, continued research is necessary to establish an evidence base for these interventions and to determine the feasibility of translating these supports into practice.

### **Facilitators of Success in Employment**

In addition to barriers impacting transition to adulthood, there are many facilitators of success. Factors optimizing employment outcomes include autism education in the workplace, supportive workplace culture, clear communication, varied work tasks and routines, and workspaces designed to support individualized sensory needs (K. A. Anderson et al., 2018). Autism education, provided by a knowledgeable professional, assists employers and organizations in learning how to adapt the environment and make accommodations to meet each employee's individualized needs. Supported employment provided by a job coach with ample training on EBPs in ASD is

known to increase the likelihood of later independence on the job. Training on ASD for both employers and job coaches and information sharing and collaboration across professionals are necessary to maintain factors optimizing employment outcomes (K. A. Anderson et al., 2018).

Although K. A. Anderson et al.'s (2018) review indicated significant barriers to and facilitators of success in transition to adulthood, the sample size was considered small, and adults considered minimally verbal or nonverbal were excluded. Therefore, results should be interpreted with caution as they only relate to a subset of adults with ASD. Future research is necessary to understand additional barriers to or facilitators of success directly related to focused adults with ASD who are minimally verbal or nonverbal.

Work experiences often result in positive postschool adult outcomes, though social and behavior skill deficits remain a barrier. Kittelman et al. (2016) found the use of ecological assessments (e.g., functional behavioral assessments) to be useful in designing evidence-based behavioral intervention plans focused on fostering prosocial behaviors on the job when adapted for use in employment settings. Prosocial behaviors often refer to helping, sharing, comforting, cooperating, and volunteering, all of which heavily rely on intact communication skills. As communication deficits are central to the diagnosis of ASD, providing access to communication supports to those who are minimally verbal or nonverbal is necessary when working to establish prosocial behaviors required for success on the job. Findings by Pfeiffer et al. (2017) further supported interventions focused on increasing social behaviors in the workplace. The combination of evidence-based interventions focused on establishing prosocial behaviors, autism training in the

workforce, effective job-coaching services, and professional collaboration underpin successful employment outcomes for adults with ASD.

### **Supported Employment: Vocational Training Experiences and Resources**

Participation in vocational training improves access to employment and reduces maladaptive behaviors in adults with ASD (Taylor et al., 2014). To further understand the effects employment has on behavioral development, Taylor et al. (2014) conducted a longitudinal study with 153 adults with ASD examining bidirectional relations between behavioral functioning and vocational activities. The researchers sought to determine whether participation in employment has the same positive effects on adults with ASD as it does on those without ASD.

For the purpose of the study, Taylor et al. (2014) interpreted improvements in behavior as improvements in autism symptoms (including communication skills), prosocial behaviors, and activities of daily living. Though other variables might have influenced the data, findings illustrated the need for increased access to vocational training during and after high school, as independence in vocational activities was found to lead to improved behavior in adults with ASD. In addition to improved behavior, increasing independence in vocational activities may lessen the severity of ASD symptoms and improve adaptive skills or skills necessary for activities of daily living (Taylor et al., 2014). These findings further supported the continued need for job coach training in EBPs for ASD (Baldwin et al., 2014; Roux et al., 2013). Findings also aligned with the work of Richardson et al. (2019) indicating that specialized communication supports, such as AAC, are frequently needed for adults with ASD to be successful in employment.

Adding to the literature on employment supports in ASD, Nicholas et al. (2015) analyzed studies evaluating vocational resources for adults with ASD. The researchers reviewed 10 studies focusing on vocational interventions for individuals with ASD across ages. Within those studies, supported employment services and the use of technology-based tools (e.g., multimedia and web-based applications) to augment job training were described as two types of vocational interventions.

In supported employment, the presence of job coaching promoted enhanced learning experiences in the workplace. Therefore, job coaching is an essential component of employment assistance for adults with ASD. Success in supported employment relies on the job coach and employer working together to find job opportunities aligned with an individual's skill and area of interest. The degree to which a job coach builds capacity in employers to support the needs of an employee is also a determinant of success (Nicholas et al., 2015).

In addition to other supports, technology contributes to vocational success for adults with ASD. Video modeling, an evidence-based intervention for ASD that uses technology, was effective in teaching interview skills, task completion, and work-related socially expected behaviors (Steinbrenner et al., 2020; Wong et al., 2015). Personal digital assistant devices, used in cueing adult employees with ASD to complete job tasks, also proved to be successful (Nicholas et al., 2015).

Although many of the studies included in the review were limited by imprecise outcomes and small sample sizes, their collective findings provide preliminary guidance for effective ways to provide vocational support to adults with ASD in the workforce (Nicholas et al., 2015). Although innovative and well received, technology-based

interventions need more rigorous research before being considered effective in employment settings. The need for job coaches to prepare employers to utilize individualized supports matching each employee's needs was a consistent finding. Therefore, there is a critical need to ensure job coaches are trained in how to coach employers and as well as employees with ASD across work settings (Nicholas et al., 2015).

Gaining access to competitive employment is a challenge for adults with ASD across levels of support needs due to specific disability-related barriers (Wehman et al., 2020). In a multisite randomized clinical trial, Wehman et al. (2020) expanded the number of participants and settings to replicate findings of the Wehman et al. (2017) Project SEARCH plus ASD Supports (PS + ASD) study. The 2020 study expanded the number of participants from 49 to 156 and extended the settings from one to four locations. The 156 participants were ages 18–21 and significantly impacted by ASD (e.g., enrolled in self-contained ASD classrooms with variable math skills, no to limited literacy skills, and inconsistent use of verbal language to communicate basic wants and needs). Though significantly impacted by ASD, participants were required to independently meet daily needs in toileting, eating, and transitioning across location as well as to meet eligibility for vocational rehabilitation and public school services (Wehman et al., 2020).

This primary purpose of the Wehman et al. (2020) study was to learn the extent to which an intensive employer-based employment training and placement program positively impacted the outcomes of competitive integrated employment in adults with ASD. Specifically, the researchers aimed to learn whether individuals who engaged in

competitive integrated employment training gained employment at a higher rate than those only receiving public school services. The researchers also investigated the differences in earned wages and hours worked, the types of jobs gained by participants, rates of retention 1 year posttraining, external factors impacting employment outcomes, and reasons related to sustained unemployment 1 year posttraining. For their study, competitive integrated employment was defined as paid employment with comparable pay and opportunities for inclusive experiences while earning equal or greater than minimum wage at a local business (Wehman et al., 2020).

Participants were placed in a treatment and control condition through a blind randomization process. The control condition included participants receiving public school services specified by their Individualized Education Programs and community-based vocational training. Participants in the treatment condition engaged in a 9-month PS + ASD work experience program across three 10- to 12-week internships aligned with participant employment goals in a local community business (a hospital). Each internship experience required participants to work 35 hours a week. The PS + ASD model included the provision of simultaneous and integrated educational and adult service agency services. Participants in the treatment group received direct instruction from trained providers, including job coaches, across disciplines funded by the state vocational rehabilitation system (Wehman et al., 2020).

Services were provided with a service provider-to-participant ratio of 1:2.5. In addition to direct instruction, job coaches provided indirect support to the internship supervisors, mentors, and employers. The provision of direct services decreased over time as the participants increased independence across job tasks. In addition to the



internship experiences, the treatment-group participants received additional employment support and training during the study. Each participant transitioned directly into supported employment services, maintaining vocational skills training, with the same vocational counselor's backing from the internship upon graduation. Training for the job coaches and educators was rooted in applied behavior analysis. Supports and strategies included, but were not limited to, task analysis, rehearsal of social communication skills, shaping and modeling, generalization of skills across settings, and prompting and prompt fading procedures (Wehman et al., 2020).

Data were collected by independent evaluators via in-person interviews with the participants, caregivers, and educators at the beginning of the year, end of the year, and at a 1-year follow-up after program graduation. Interview questions were derived from the Vocational Index for Adults with Autism Spectrum Disorders by Taylor and Seltzer (2012). Wehman et al. (2020) also used the Supports Intensity Scale by Thompson et al. (2004) and the Social Responsiveness Scale, second edition, by Constantino and Gruber (2012) to measure overall support needs, the impact of behavioral and medical challenges, and the impact of the social communication symptoms of ASD. Blind randomization resulted in participants being placed in four parallel blocks across four participating hospital locations (Wehman et al., 2020).

Results revealed 32% of participants in the PS + ASD treatment group graduated from high school with competitive employment; however, only 5% of the control group found employment. The participants in the treatment group were 5.84 times more likely to achieve employment at graduation and 4.5 times more likely to sustain employment for 1 year postgraduation than the participants in the control group. The PS + ASD model

supported a seamless transition from school-based to community-based employment services, which appeared to increase the rate of sustained employment to greater than 90% still employed 1 year postprogram. Those individuals employed posttraining were earning greater than minimum wage and working an average of 20 hours per week in jobs across several industries including health care, retail, manufacturing, and hospitality (Wehman et al., 2020).

Although many positive outcomes and key factors attributed to the success of the Wehman et al. (2020) study, barriers in the forms of time, cost, staffing, interagency collaboration, and business participation were also present. An uneven attrition rate between the treatment and control group, with the control group having a higher rate of attrition, and the sample not necessarily being representative of the overall population were considered limitations. That said, both sets of concerns were addressed and minimized secondary to the depth of demographics gathered and the study being a replication of a previous randomized controlled design (Wehman et al., 2020).

Overall, the findings revealed robust community-based work experiences given the support of trained educational providers and job coaches using evidence-based applied behavior analytic teaching techniques paved a seamless path to viable jobs aligned with individualized employment goals for young adults significantly impacted by ASD. Future research should evaluate the level of intensity necessary and complete a cost analysis to ensure training and service provided are aligned with sustainable funding, ensuring a community-viable model (Wehman et al., 2020). In referring back to job coaches gaining access to training in EBP for ASD, especially when supporting individuals who are minimally or nonverbal, the study underscored the relevancy and the

essential need for access to sound vocational experiences prior to leaving the public school system.

### **BST and Employment**

Effective interventions targeting the development of vocational skills are crucial to supporting individuals with ASD in finding and sustaining employment. One challenge for adults with ASD is a lack of evidence supporting practices likely to be effective. BST is a procedure that many clinicians and researchers have utilized to teach a variety of skills in adults with ASD and intellectual disability. Steps in BST utilized to teach a new skill include instruction, modeling, rehearsal, and feedback. (Parsons et al., 2012). BST is considered an evidence-based method for training direct-service providers to apply behavior change and related processes (Parsons et al., 2013).

As an intervention, BST is considered an effective method for ensuring the mastery of a variety of behaviors, including task completion, social skills, and conversational skills. Additionally, BST is relatively easy to learn and use and is a low-cost approach for teaching new skills providers can apply across settings both before and throughout employment (A. Anderson et al., 2017). These factors are significant when thinking of job coaches and their need to have a user-friendly, effective, evidence-based method of supporting adults with ASD in the workforce.

To determine the effectiveness of using BST to support vocational skills training in adults with ASD, A. Anderson et al. (2017) conducted a review of related research using a single case study design. The review focused on intervention studies investigating enhancements in work-related, adaptive, and social-communication skills needed by adults with ASD in employment. Generalization and social validity data were also

assessed across interventions. The authors utilized the What Works Clearinghouse (2014) standards as a reference to determine whether an intervention qualified as evidence based. The What Works Clearinghouse standards classify research based on the level in which a study meets evidence-based standards: without reservations, with reservations, or does not meet criteria (A. Anderson et al., 2017).

Participants ranged from 14–42 years of age with diagnoses of ASD (A. Anderson et al., 2017). The review process included 18 studies and a total of 62 participants. Seven of the 18 studies met the What Works Clearinghouse design standards without reservations. Studies meeting criteria included BST, video-based instruction, and self-management procedures. Nine of the studies were on BST, with seven demonstrating generalization of skills and all reporting positive treatment acceptability. All BST interventions included instruction, provision of a model of the target response, opportunity for practice, and corrective feedback or reinforcement as appropriate. Of the interventions reviewed, only BST met the researchers' criteria of an evidence-based intervention for providing vocational training for adults with ASD. A. Anderson et al. (2017) indicated that further research is needed to determine the efficacy of the other identified interventions.

The research on evaluating interventions guiding the development of job-related social skills in adults with ASD continues to be limited (Grob et al., 2019). Deficits in social skills beyond job-specific skills tend to be the most significant impediment to successful employment for people with ASD (Chen et al., 2015; Hendricks, 2010). To extend the literature on the assessment and training of employment skills for persons with ASD, Grob et al. (2019) used brief BST and stimulus prompting to promote job-related

social skills.

Participants included three adults between the ages of 19 and 27, previously diagnosed with ASD (Grob et al., 2019). Though all three participants appeared to have some verbal language, the use of language for communicative purposes was challenging. One of the participants had difficulties with not only expression but also producing intelligible speech. The participants' communicative abilities are relevant to disclose due to the study evaluating teaching procedures effective in improving job-related social skills focused specifically on social communicative abilities.

Grob et al. (2019) used a concurrent multiple-baseline design across job-related social skills to assess the effects of the intervention and understand the potential for generalization of responding across different but related communicative situations. The study included an assessment and training phase. The assessment phase focused on the participants' ability to confirm understanding of a supervisor's feedback and instructions, to ask a supervisor for help across various situations, to inform a supervisor of task completion, and to apologize when necessary. These social communication skills were selected as they seem essential for employment success and the establishment of positive social relationships between employees with ASD and their supervisors (Grob et al., 2019).

The training, broken up into baseline, training, and posttraining phases, assessed each participant's ability to acquire and generalize job-related social communication skills using brief BST combined with stimulus prompts (Grob et al., 2019). Stimulus prompts ranged from color-coded text to text-plus-picture prompts when necessary. Results revealed this intervention package was successful in improving targeted social

communication skills for two of the three participants. Stimulus prompts increased the likelihood of generalization when the prompt format met both the individual's communicative needs and was a match to the employment setting.

Though the sample size was small, Grob et al.'s (2019) findings provide information to consider when preparing an individual for employment, as the social communication skills targeted are critical to success on the job. The low cost, easy-to-learn nature, and flexibility of BST with stimulus prompts create a viable and acceptable treatment approach for both job coaches and employers supporting individuals with ASD in the workplace. Additionally, the level of individualization that can occur within a BST procedure supports the unique needs of adults with ASD. Future research should focus on determining the lasting implications of this type of intervention on long-term vocational skills (Grob et al., 2019).

### **Perceptions of Employment Support Services**

Many problems and gaps remain in resources and possibilities fostering employment achievement in adults with ASD (Nicholas et al., 2018). In an attempt to address current issues and gaps in resources, Nicholas et al. (2018) explored the perceptions of employment assistance services for adults with ASD. An online survey was utilized to examine the perceptions of vocational service providers on the quality of employment resources available. The survey was completed by 137 employment service professionals working with adults with ASD getting employment support. Questions focused on how well an organization met the vocational, mental health, community access, and medical needs of adults with ASD. Information was also gathered on how thoroughly an organization planned and evaluated its vocational services. In addition to

the surveys, some interviews were conducted (Nicholas et al., 2018).

Findings revealed perceptions of the current vocational services available to adults with ASD as insufficient. Results also highlighted a lack of access to equitable employment opportunities for individuals with ASD (Nicholas et al., 2018). Limited integration and collaboration between support service professionals impacted success in employment (K. A. Anderson et al., 2018; Nicholas et al., 2018). A disparity existed in perceptions among vocational service professionals, individuals with ASD, and family members regarding the caliber and impact of supported employment services (Nicholas et al., 2018). Service providers regarded their work to be much more helpful than did caregivers or people with ASD. This discrepancy in perspectives might be directly related to the lack of job-coach training in EBPs for ASD (Nicholas et al., 2018).

An increase in equal employment opportunities, supported employment services provided by ASD-trained professionals, integrated services, and collaboration between professionals will enhance the quality and perceived benefits of supported employment services. These changes also will increase the likelihood of successful employment experiences for adults with ASD. Though the findings did not address perceptions of families of individuals with ASD who are minimally verbal or nonverbal, the information gained provides a pathway to improvements in employment services for adults with ASD (Nicholas et al., 2018).

### **Belief Systems and the Impact on Employment Success**

Systems have a broad impact on individual actions, which, in turn, influence outcomes. To provide optimal services to individuals with ASD, service providers should have positive beliefs regarding the individuals' ability to become successfully employed.

Recognizing positive outcomes often motivates a person to engage in productive activities towards a goal (Cooper et al., 2007). When job coaches supporting adults with ASD have positive beliefs about an individual's potential to be employed and achieve employment success, the coaches' confidence impacts their outcome expectation.

Outcome expectancy is one's opinion that a particular behavior will produce a specific result, hence a view about a behavior's consequences. People with positive outcome expectations often have great self-efficacy beliefs. Self-efficacy is a person's viewpoint that they can complete an action needed to create a particular result (Bandura, 1997). The relationship linking knowledge, self-efficacy, belief, expectation, and outcome aligns with the expectancy theory of motivation. The expectancy theory suggests a person is motivated to work based on the perception that their actions will result in the anticipated outcome. In a sense, this theory explains why people choose to do one thing over another and the level to which they perform (Vroom, 1964).

Job coaches who believe they have skills necessary to support an adult with ASD on the job successfully are more likely to expect and therefore optimize positive employment outcomes. When a job coach understands autism and believes a person with ASD should and can achieve employment success, the opportunities for a good job match, quality performance, and positive work experiences are greater.

Employers who have positive experiences providing supports for individuals with ASD in the workplace are more likely to continue to hire individuals requiring supports on the job (Ochocka et al., 1994). Positive experiences in providing support often result from training. Providing training on awareness and EBPs for ASD is an effective approach to fostering positive relationships and curtailing misconceptions (Dreaver et al.,



2020).

Given that well-trained employers often have positive experiences in employing and supporting individuals with ASD and that these positive experiences often increase the likelihood of successful employment, Dreaver et al. (2020) explored success factors facilitating positive work experiences for adults with ASD from the employers' perspective. Views of 16 managers and four directors working for disability employment support organizations in Australia and Sweden were analyzed to learn more about the aspects of successful employment. The significant variation in disability support services across countries allowed for the gathering of more robust information on employment outcomes. All participants managed or directed individuals with ASD, had an understanding of ASD or general disabilities, and had experience in successfully supporting an individual with ASD in the workforce (Dreaver et al., 2020).

A qualitative research method with semistructured interviews at both the company and individual levels was conducted by Dreaver et al. (2020). Interviews gathered information to examine and describe circumstances promoting the prosperous employment of people with ASD. On the organization level, questions focused on the company's employment model, company policies and processes, the provision of supports, and collaboration across work environments and therapeutic teams. The individual interviews gathered information on the participants' workplace, skills, job duties, and accommodations for their employees with ASD (Dreaver et al., 2020).

Results revealed knowledge and understanding of ASD, work environment, and job match to be sets of factors facilitating the successful employment of individuals with ASD. Knowledge and understanding of ASD were fundamental in fostering positive

office relations among employees with ASD and their coworkers and in increasing the feelings of confidence and acceptance of employees with ASD. Further, having previous knowledge of and experience with ASD allowed participants to understand how to think about the work environment, the impact of the environment on the work experience of an employee with ASD, and how to accommodate for individualized needs. Maintaining an open mind and flexible attitude about workplace accommodations and modifications is essential to supporting employees with ASD successfully (Dreaver et al., 2020).

A good job match, based on skills, strengths, and interests, was described as an essential factor influencing an individual's ability to get and maintain a job. Job performance was directly related to how well matched an employee with ASD was with the position. A strengths-based method to job matching was foundational to each employer's long-term success in supporting individuals with ASD and other disabilities. Finally, job matching is contingent on assessing an employee's strengths and weaknesses and the work environment. A job match is also dependent on the overall knowledge and understanding of ASD among coworkers and employers (Dreaver et al., 2020).

Suitable job matches result in the independence of the employee and the satisfaction of the employer. The provision of support by expert employment providers to employers or managers of individuals with ASD was also a major factor in promoting successful employment. Those employers and managers who received support from experts, such as job coaches, reported enhanced supervisory skills and critical-thinking skills during stressful situations. Even with prior knowledge and experience in supporting individuals with ASD, additional formal training on best practices for ASD is necessary to ensure job matches, support employees with ASD, foster inclusion and acceptance, and

enhance work performance (Dreaver et al., 2020).

Despite study limitations, such as the qualitative design not allowing for transferability, findings reinforced the notion that knowledge impacts self-efficacy, and self-efficacy affects one's belief system (Dreaver et al., 2020). Further, employers who have received training in best practices for ASD and guidance on how to translate their knowledge into practice to support employees with ASD believe individuals with ASD should work, can work, and therefore will achieve success.

## **PD**

PD is necessary for professional growth and is often used to achieve and maintain a variety of professional certifications or licensure. As PD can be defined in many ways, for this study, PD is described as engagement in job-related learning opportunities or trainings translatable into practice. The development of effective PD is a dynamic and multifaceted process. Therefore, when developing PD, a variety of factors, such as the venue, format, strategies, techniques, and teaching tools, must be considered (Canaran & Mirici, 2019).

To ensure consistency in the use of terms, *venue* refers to where training occurs. Venues can be face to face, online, or a combination of the two. The format is related to how the training is delivered. Trainings can be delivered in a synchronous manner, such as online learning taking place in real time, or asynchronous, such as online learning without real-time interaction. PD can be provider led or participant driven. The format also may refer to how information is provided, such as the use of distributed or mass practice (Canaran & Mirici, 2019; Philipsen et al., 2019).

Within any training, various teaching strategies or techniques are utilized to help accomplish a goal or improve a skill. Strategies or techniques, terms that are used synonymously in this study, may include video demonstrations, modeling, reflective feedback, role play, and threaded discussion boards. Training also varies in terms of the specific tools used to make learning easier, more accessible, and more organized (Canaran & Mirici, 2019; Philipsen et al., 2019). Examples of tools that may be used within a PD training are Flipgrid and Padlet (Kelly & Atwood, 2019).

Access to PD on EBPs for ASD is essential for job coaches working with adults with ASD. Although necessary, specialized training for job coaches on ASD is often unavailable or ineffective (Brock et al., 2016; Nicholas et al., 2018). Because PD for job coaches is limited and often inadequate, components of effective PD need to be identified to ensure future trainings positively impact job coaches and those they serve. Van Oorsouw et al. (2009) conducted a meta-analysis of studies focused on effective training measures for professionals helping people with an intellectual disability. Participants across studies presented with a wide range of intellectual abilities. The researchers sought to determine whether training effectiveness is driven by the goal of the training, the effect of in-service training versus job-embedded training on staff knowledge, or the techniques used in the training.

Training formats included traditional face-to-face in-service workshops, job-embedded training, or a combination of both. The training techniques included direct instruction, video demonstration, prompting, modeling, feedback, role play, self-monitoring, rehearsal, rewards, practice discussion, goal setting, and access to relevant literature. The provision of feedback occurred in various formats (i.e., verbal, written,

graphic, and video) and ranged in type from corrective and constructive to verbal praise and reassurance (Van Oorsouw et al., 2009).

In reviewing training effectiveness, the combination of in-service workshops paired with job-embedded training was the most impactful for training staff on skills necessary to perform direct treatment procedures accurately. In-service training that included multiple teaching techniques paired with verbal feedback was more potent than training only using a single teaching method, except in training on the job. The number of techniques used within job-embedded training was not found to be significant. However, the provision of feedback provided verbally or via video was found to be effective when provided during job-embedded training. Feedback comprised of reinforcement and correction was found to be the most effective (Van Oorsouw et al., 2009).

Despite limitations of the Van Oorsouw et al. (2009) study, results identified effective training elements and the most optimal formats. Elements most effective in improving the practice of direct-service providers included the use of multiple teaching techniques paired with verbal or video feedback. A combination of a face-to-face in-service workshop paired with job-embedded training was found to be the most successful PD format (Van Oorsouw et al., 2009). Effective PD should be ongoing and include training using multiple teaching techniques, practice, feedback, praise, opportunities for reflection, and follow-up support when possible (Canaran & Mirici, 2019; Van Oorsouw et al., 2009). These findings should serve as a guide when developing future PD trainings for job coaches on EBPs in ASD.

As mentioned above, the venue of a PD is an important factor to consider. Advancements in technology have shifted many face-to-face learning experiences to the

online world. Online learning may be more cost effective, provides increased access to education, and allows for flexibility in learning. Despite advances in the research on online PD, and although face-to-face and online PD share many of the same practice principles, additional examination of effective online PD continues to be necessary (Philipsen et al., 2019; Pittman & Lawdis, 2017; Van Oorsouw et al., 2009).

Due to the lack of PD available for job coaches working with adults with ASD, literature on creating effective PD for teachers can be used as a reference, as the two disciplines have many comparable aspects. Teacher PD is critical for education. However, teacher PD alone does not automatically translate into improved practices (Cho & Rathbun, 2013). Further, quality and assurance that a training experience will positively affect a learner are also not necessarily related to increased access to or availability of online PD. The term *online teacher PD* refers to various learning formats delivered online to support teachers (Cho & Rathbun, 2013). The development of standards for online learning is useful in ensuring high-quality online PD leading to positive outcomes (Powell & Bodur, 2019).

Early in the expansion of online teacher PD, several attempts to articulate guidelines and standards were set forth (International Association for K-12 Online Learning [iNACOL], 2011; International Society for Technology in Education, 2008; National Education Association, 2011; Southern Regional Education Board, 2004). Current standards for online teacher PD are available in the *National Standards for Quality Online Courses, Version 2* (iNACOL, 2011). The iNACOL (2011) provided a guide for effective use of the content, instruction, assessment, technology, and evaluation in online learning, including a complete cross-reference of best practice available. The

iNACOL endorsed the work of the Southern Regional Education Board (2004) and included the primary fundamental criteria for online courses from the iNACOL-endorsed National Education Association (2011) *Guide to Teaching Online Courses*. Updates included in the second version of the iNACOL standards incorporated reviewer considerations for each indicator and a rubric to assist in the review of online courses (iNACOL, 2011). Updates in the third edition (Virtual Learning Leadership Alliance & Quality Matters, 2019a, 2019b) included additions of two standards: (a) course overview and support and (b) accessibility and usability.

In an effort to add to the literature and best practice standards on effective online PD, a 6-week online training for direct-service providers using several instructional techniques (i.e., visual, auditory, and kinesthetic) was conducted by Pittman and Lawdis (2017). Seventeen providers met inclusion criteria. Data were collected through two different pre- and posttraining online surveys, one using a Likert scale and the other gathering qualitative information. The first survey gathered information on learning-style preferences, confidence, the effectiveness of using a variety of teaching techniques, and the usefulness of online learning. The second set of pre- and posttraining perception surveys were designed to understand the perceived impact of trainings incorporating several teaching techniques on the translation of knowledge into practice (Pittman & Lawdis, 2017).

Results revealed that all participants valued the online learning experience, with the audio and video instructional strategies most significantly contributing to increased competency feelings. The course's self-paced and flexible scheduling increased enjoyment in learning and engagement (Pittman & Lawdis, 2017). Learning style, or how

one gathers, processes, interprets, organizes and analyzes information (Kharb et al., 2013), was found to impact the perceived feelings of competencies across participants. The combination of visual elements and reflective practices was found to be the most useful (Pittman & Lawdis, 2017).

Visual elements support a learner's ability to process information through seeing (Kharb et al., 2013). Reflective practices involve assessing or thinking about what has been learned and then connecting the information to a meaningful experience to ensure understanding and use of the knowledge gained (Nistor & Samarasinghe, 2019). Though these aspects were said to have an impact on knowledge, recent research has shown learning style to be questionable and have no significant effect on academic performance (Cimermanová, 2018). This being the case, trainings designed to address a variety of perceived learning styles are more likely to be effective than those only addressing one mode of learning (Kharb et al., 2013; Pittman & Lawdis, 2017).

Although the Pittman and Lawdis (2017) study had a small sample size and only included one discipline of providers, findings further validated the use of online training as an effective platform for PD of direct-service providers working with adults with disabilities. Additionally, integrating several teaching techniques into a learning experience was again found to be effective in increasing the providers' knowledge (Philipsen et al., 2019; Pittman & Lawdis, 2017; Van Oorsouw et al., 2009). Further, an increase in knowledge was noted to positively impact a provider's perceived feelings of clinical confidence and competence (Pittman & Lawdis, 2017).

To further examine online teacher PD and how access can increase participant engagement, Cho and Rathbun (2013) conducted a study of short-term online teacher PD



using a problem-based learning method. Problem-based learning is based on extracting learning opportunities from real-life problems. A case study approach was used as the primary methodology. Interviews with 15 participants, program facilitator notes, observation of online teacher PD programs, and participant satisfaction surveys were used to gather information on the efficacy of online teacher PD programs.

A series of online educator PD programs, using a problem-based learning approach focused on pedagogical practices and instructional technologies, was created by Cho and Rathbun (2013). Critical thinking and writing learning objectives were primary topics included in the programs selected. Both trainings involved opportunities for firsthand practice, projects, and activities. Participants needed to finish the projects, examine the resources, and participate in the structured online group discussions. Participants engaged with each other through discussion boards (Cho & Rathbun, 2013).

Outcomes revealed discussion board use and asynchronous online discussions provided a user-friendly platform for participants to share thoughts related to their learning. Increased engagement and learning activity occurred in the online teacher PD compared to that previously seen in traditional learning programs, though some participants lacked independence in completing the final assignment. An enhanced level of understanding of the skills necessary in taking an online course, from both the educator and learner perspective, was seen across the teacher participants. Tasks, projects, activities, work examples, and selected resources were essential elements to creating a short-term online teacher PD program (Cho & Rathbun, 2013).

These findings highlighted several additional considerations for future research and implementation. PD developers need to provide up-front information on the course's

purpose, the activities involved, and expectations related to time and amount of work. A disparity in expectations and perception resulted in the attrition of participants. The course's time frame impacted recruitment and commitment to the learning process (Cho & Rathbun, 2013). These outcomes can support the creation of new and more productive online PD for job coaches working with individuals with ASD in employment settings.

Teachers and other professionals face a variety of challenges in accessing useful PD. Problems range from a lack of time and financial restraints to location. Although access to online teacher PD has mitigated some of these issues and standards are available to help ensure quality, the perception of those engaging in online teacher PD continues to be necessary to evaluate (Powell & Bodur, 2019). In a qualitative multicase study, Powell and Bodur (2019) examined teachers' perceptions of the design and implementation of job-embedded online teacher PD. Participants were six public school teachers with access to an extensive online library of video modules highlighting education EBP. Participants viewed short instructional videos and responded to reflective questions following each module. The online training format allowed for monitoring of utilization and participation (Powell & Bodur, 2019).

Results showed participants mostly felt the training was consistent and aligned with best practices. However, some participants indicated the learning experience was not individualized enough to meet their educational and professional needs. From the viewpoint of authenticity, participants agreed on the presentation of information but noted the videos were outdated and not matched with current teaching practices. The usefulness of the content was considered supportive of both new and previously learned teaching practices (Powell & Bodur, 2019).

When judging context, the participants enjoyed the option to complete the training at their own pace and schedule. Still, they would have preferred to access the training at a location of their choice instead of being required to use planning times during their regular work day. Participants also seemed to prefer online teacher PD (Powell & Bodur, 2019). Outcomes specific to interaction and collaboration included the need for hands-on practice paired with online training, collaborative brainstorming conversations, and opportunities to learn from real-life examples. Participants noted that interactive reflection would have enhanced the learning experience, as opportunities to think through and discuss the video clips were not available (Powell & Bodur, 2019).

Vital principles of successful online teacher PD design and execution included reflection, relevancy, and usefulness to a teacher's educational needs. Other elements essential to success included interaction and collaboration in the training process and incorporating activities mirroring practical experiences (Powell & Bodur, 2019).

Although the study had a small sample size, and perceptions of participants were not considered generalizable, the study demonstrated the need to consider relevancy, opportunities for reflection, and usefulness of the content when developing PD courses. Findings have been consistent across studies. These findings add to the understanding of how best to design and implement successful online teacher PD (Powell & Bodur, 2019).

The transfer of knowledge into practice is an essential aspect of effective PD. When designing and implementing PD training, expertise, experience, and context are essential considerations (Powell & Bodur, 2019). The design and implementation of future online PD for job coaches working to support successful employment experiences of adults with ASD should include these findings with the current standards for creating

quality online teacher PD.

### **AAC in Employment**

For a particular segment of the population with ASD, AAC is a needed mode of communication, especially when interacting with unfamiliar people. At work, employees likely need to communicate with different people regularly. As a practice, AAC addresses the needs of people with communication deficits marked by speech-language production impairments with or without deficits in comprehension (American Speech-Language-Hearing Association, n.d.-a, para. 1). Individuals with ASD who cannot communicate effectively using language rely on AAC to supplement verbal abilities (American Speech-Language-Hearing Association, n.d.-a). The use of AAC provides access to functional communication for those with limited to no verbal skills. Having a functional means of communication makes communicating more accessible and therefore reduces the need to use behavior to communicate. Opportunities for independent participation across activities, including work, are enhanced through the use of AAC systems or strategies. The provision of AAC can provide a person with the ability to ask for help, indicate task completion, request more work, answer questions, provide explanations, and converse in work-related conversations. All of these are essential communication skills for employment.

The majority of research on employment for individuals with ASD has been on those categorized as high functioning, who tend to primarily communicate using verbal language (McNaughton & Richardson, 2013). That said, 20%–30% of people with ASD rely on AAC to supplement or augment their lack of spoken words and support community engagement. Having a diagnosis of ASD with complex communication needs

results in additional complications when trying to obtain and keep a job.

A critical factor in the quality of life for most adults is employment, yet fewer than 50% of individuals with ASD are employed. Adults with ASD who are minimally verbal or nonverbal require intensive support in employment. Many factors contribute to successful outcomes for individuals who use AAC in the workforce. Successful employment appears to be optimized when employers value the development of an employee's knowledge and skill, an individual's skills and interests match the position, and individualized supports are in place (McNaughton & Richardson, 2013).

McNaughton and Richardson (2013) explored these factors to understand how to support individuals with ASD who use AAC in achieving employment success. Their review looked at the employment experiences of three adults, 18–30 years of age, with ASD and complex communication needs. Communication skills across participants ranged from the use of basic manual signs and gestures to the use of low- to high-tech AAC speech-generating devices. One of the three participants was verbal. Though verbal, due to difficulty in using oral language, this participant chose email as his preferred mode of communication while at work (McNaughton & Richardson, 2013).

In evaluating the first participant's employment experience, contributing factors to his success were immediate training on job-related tasks and the manager being sensitive to and supporting all communication needs (e.g., communicating using short, written messages). Factors leading to the success of the second participant included a job matching interests and skills, a sustainable time commitment, access to a speech-generating device for communication needs, and an invested employer. A trial work period was necessary to gain the manager's confidence in the participant's ability to learn

the essential skills for the job before making a job offer (McNaughton & Richardson, 2013). Once the manager felt confident in the participant's skills, a path to successful employment began. The third participant's employment was successful due to the provision of supports for workplace participation, including assistive technology, for completing job duties and for communication. Social supports for establishing and maintaining positive workplace relationships also led to the participant's success. Assistive technology in the form of AAC (i.e., communicating through a speech-generating device, written messages, and email) positively impacted each participant's success. Assistive technology also supported social interactions and the development of workplace relationships (McNaughton & Richardson, 2013).

Communication skills are significant for employment as they impact one's position, pay, and satisfaction at work. Successful communication requires support from both the individual communicating and a communicative partner. Buy-in, or the belief in one's ability to be successful on the job and the belief that accommodations for individuals with ASD should be a natural part of the work experience, is key to employment success (McNaughton & Richardson, 2013; Ochocka et al., 1994). Therefore, successful employment for individuals with ASD who use AAC is possible when the development of communication skills, social interactions, and job-related tasks are valued; when a good job match occurs, given the provision of communication supports; and when employer training is accessible (McNaughton & Richardson, 2013).

Knowing that AAC can support adults with ASD, Richardson et al. (2019) set out to learn how to cultivate meaningful paid work experiences for people with ASD who use AAC. To accomplish this, they examined employment experiences with positive

outcomes. The study addressed the various jobs individuals with ASD who use AAC hold, employment advantages, employment challenges, and the assistance needed to acquire and sustain employment. Richardson et al. examined the experiences of seven successfully employed adults with ASD who use AAC.

Eligibility for the study required participants to read and write at a functional level, grant informed consent or assent to being interviewed, and have their family members and employers share information concerning their communication skills and work participation. Information gathered came from written questionnaires and telephone and online interviews with individuals with ASD, parents, and employers. Further, the researchers collected data on the communication profiles of each individual with ASD. Proxys were allowed for any of the individuals with ASD needing help completing the questionnaires (Richardson et al., 2019).

A modified Talking Mats procedure was utilized in interviews conducted with participants with ASD unable to respond verbally or use a robust AAC system. Talking Mats is a visual communication system that can help individuals with or without oral language to organize and express their thoughts, ideas, and feelings across a variety of topics (Richardson et al., 2019).

Participants demonstrated difficulties in communication via AAC, social skills, emotional expression, behavior, shifting schedules, and learning new skills at work. However, findings established that people with ASD who use AAC could achieve successful employment when furnished with supports satisfying their requirements. Additionally, AAC applications and other technology-based strategies strengthened work-essential social communication and language skills beyond that of picture-based

communication supports (Richardson et al., 2019).

Limitations included the small sample size and a mismatch between the employment experiences described by the participants and reported realities of other working individuals with ASD who use AAC. However, even with these shortcomings, results supported the need for more minimally verbal and nonverbal adults with ASD to be gainfully employed, given adequate supports, in positions matching each individual's profile and interests (Richardson et al., 2019).

With advances in technology and the current evidence demonstrating successful use of AAC to support social participation across community settings, online PD for professionals working with individuals with ASD is essential. Training should focus on EBPs in ASD, awareness and understanding of AAC, the impact of AAC on an individual's participation in society, and where to go to gain ongoing support (McNaughton et al., 2018). The current employment outcomes for adults with ASD support an ethical and imperative need to provide job coaches more access to translatable and cost-effective PD on EBPs for ASD and AAC.

The research findings on AAC and employment have indicated employment for individuals who use AAC is enhanced when job coaches, employers, and coworkers are knowledgeable about ASD and AAC. Indicators of success include an intervention addressing social skills expected in the workplace, the identification of a position matching the potential employee's skills and interests, and access to individualized supports (Hendricks, 2010; McNaughton et al., 2018; McNaughton & Richardson, 2013; Richardson et al., 2019).

Over the past several decades, research has identified several EBPs that have



implications for the training of job coaches who support adults with ASD and AAC needs in the workplace. These relate to vocational training for these adults, PD, and online PD. EBPs for vocational training include the provision of job coaches trained in EBPs for training an employee with ASD, the hiring employers, and any necessary staff. Vocational training is most effective when provided within a meaningful and integrated work experience with work paid at an equitable wage. Employment training focused on both job tasks and social skills expected in the workplace is critical for long-term success. Individualized behavioral and communication supports, along with necessary environmental adaptations, optimize the vocational training experience and, therefore, successful employment outcomes for adults with ASD (Brock et al., 2016; Hendricks, 2010; McNaughton & Richardson, 2013; Nicholas et al., 2015, 2018; Roux et al., 2013; Taylor et al., 2014).

Understanding the need for job coaches to be knowledgeable in ASD and AAC also requires understanding the EBPs for PD. These practices include using a variety of teaching techniques, practice, feedback, praise, and opportunities for reflection. The most effective training models have included a combination of face-to-face workshops with job-embedded practice (Canaran & Mirici, 2019; Van Oorsouw et al., 2009). Although job-embedded experiences support the translation of knowledge into practice, in vivo rehearsal of skills is only as effective as the information learned. Due to the lack of effective PD available for job coaches working with adults with ASD who are minimally verbal or nonverbal, evidence-based training content, specific to this area, first must be developed and evaluated before adding a job-embedded practice component.

Due to advances in technology and access to traditional face-to-face trainings

often being based on time, location, and cost, PD has shifted from in-person workshops to online. Although many of the guiding principles of effective PD remain the same from traditional to online PD (i.e., incorporating multiple teaching techniques, practice, feedback, praise, and opportunities for reflection), some distinct differences remain. To ensure efficacy and quality of learning, EBPs specific to online PD exist. A few of these practices include the use of a variety of online teaching tools (e.g., video models, discussion boards, Flipgrid, Padlet), ensuring the training content is both relevant and authentic, and integrating collaboration and interaction across participants. Collaboration and interaction must occur in the online environment, as these experiences take the place of face-to-face social interactions integral to the learning process. Access to evidence-based online PD is necessary for successful learning and translation of knowledge into practice to take place (Cho & Rathbun, 2013; iNACOL, 2011; Philipsen et al., 2019; Pittman & Lawdis, 2017; Powell & Bodur, 2019; Van Oorsouw et al., 2009).

### **Theoretical Framework**

Research related to adult learning and education has been based on various theories (Bryan et al., 2009). To optimize desired outcomes, PD activities should address adult learning principles and incorporate practices that support the application of new information to job-specific responsibilities. The impact of online PD training on the job coach, their clients, and the environment should be considered when creating and delivering training, as positive interactions between these components are essential to successful employment. Bronfenbrenner's (1977) ecological systems theory is a model of human development as a transactional process whereby direct and indirect interactions with different aspects of the environment influence learning. The theory is useful in

guiding the design and implementation of adult PD activities. Bronfenbrenner initially conceptualized the interactions between the individual and their environment across four ecological systems, with each system being embedded or nested within the other. The model has evolved to include five ecological subsystems. The first and most immediate layer is the microsystem. The microsystem encompasses an individual's relationships, social interactions, and immediate surroundings. The second layer surrounding the microsystem is the mesosystem. The mesosystem includes the different interactions between the individuals within the microsystem. The exosystem is the third layer, including elements of the microsystem indirectly impacting the individual. The fourth, outermost layer is the macrosystem. The macrosystem encompasses cultural and societal beliefs that influence an individual's development. Lastly, the chronosystem is the fifth layer of the system. The chronosystem focuses on the interaction between all the systems and how they affect one another over time (Bronfenbrenner, 1977).

Several relationships are present when applying Bronfenbrenner's (1977) theory to job coaches supporting adults with ASD who are minimally verbal or nonverbal and use AAC in the workforce. The microsystem represents the connection between an individual with ASD at the epicenter and a primary caregiver, the employer, and staff within an individual's workplace. For individuals with ASD who use AAC to communicate, the microsystem is often the system in which recommendations for and predictions of success in the use of AAC take place. Success in the use of AAC is often dependent on an individual's motivation for using AAC and how the environment and people within it will accept, support, and respond to a less traditional form of communication (Loncke, 2021).

A person's level of interaction within their daily environment represents the mesosystem. The mesosystem incorporates the relationship between the individual with ASD, the job coach, the employer, the staff, and the acceptance of an individual's AAC system within the workplace. A communication partner's perception of an individual who uses AAC as someone who can and will speak is significant as it impacts a person's potential for communicative success (Loncke, 2021).

Workplace situations indirectly impacting an individual with ASD are encompassed within the exosystem. A job coach's expectations of an employee with ASD, for example, may increase as the individual's level of independence in communication increases, thus impacting workplace relationships and job performance. Growth in communication skills offers the opportunity to engage in more frequent and complex communicative interactions and may impact available employment opportunities (Loncke, 2021).

The fourth system within the Bronfenbrenner (1977) model is the macrosystem. In the context of the current study, the macrosystem represents the level of acceptance towards disabilities and diversity, including those who use AAC. Significant factors within this system include social inclusion, employee integration in the workplace, recognition of the rights of individuals with disabilities, and opportunities for employment (Loncke, 2021). Finally, the chronosystem consists of all of the experiences an individual has had during their lifetime, including environmental experiences, major life transitions, and historical events. When applying this model to minimally or nonverbal adults with ASD who use AAC in the workforce, the chronosystem represents an individual's age of diagnosis, years and intensity of intervention, family resources,

experience with AAC, and how these factors have impacted the individual across the various stages of their development. Each of these forces can affect an individual's ultimate success in the workplace (Bronfenbrenner, 1977; Bronfenbrenner & Evans, 2000).

Though developed with a pediatric focus, Bronfenbrenner's (1977) ecological theory is a learning model that can apply to the relationships and interactions between adults with ASD, their caregivers, job coaches, employers, staff, and workplace settings. Research has supported the notion that adults with ASD in the workforce are indeed part of a unique ecosystem involving many individuals and environments that must interact, interconnect, and influence each other to develop effectively (Bronfenbrenner & Evans, 2000). When components within this ecological system are synchronized and work together productively, the likelihood increases of successful and meaningful employment experiences for adults with ASD who are minimally verbal or nonverbal and use AAC.

### **Research Questions**

The study was designed to address the research questions listed below.

1. To what extent did the job coaches increase their knowledge of EBPs in using a BST approach to facilitate communication in response to the BST PD?
2. To what extent did the job coaches increase their reported self-efficacy in utilizing EBPs in using a BST approach to facilitate communication in response to the BST PD?
3. Was there a positive correlation between increases in job coaches' knowledge of EBPs and job coaches' reported beliefs about their clients' potential for successful employment?

4. Was there a positive correlation between increases in job coaches' self-efficacy of EBPs and job coaches' reported beliefs about their clients' potential for successful employment?

### **Chapter 3: Methodology**

The purpose of the study was to advance the field of job coaching by developing an online PD teaching the use of BST (i.e., a prescribed set of EBPs for teaching individuals with ASD) to facilitate communication in the workplace. This training was aimed to increase the knowledge and self-efficacy, and in turn, the belief systems, of job coaches working with adults with ASD who are minimally verbal or nonverbal across employment settings. Research questions posed examined the extent to which job coaches increased their knowledge of and reported self-efficacy in utilizing EBPs in using a BST approach to facilitate communication following the training. This study investigated whether there was a positive correlation between any increases in job coaches' knowledge of EPBs and job coaches' reported beliefs about their clients' potential for successful employment. Positive correlations between increases (or changes) in job coaches' self-efficacy of EBPs and job coaches' reported beliefs about their clients' potential for successful employment were explored. This chapter discusses the participants, instruments, procedures, research design, data collection, and data analysis of this study. Each section's contents are detailed to ensure precise implementation for future reproduction with a high level of reliability.

#### **Participants**

This section includes a discussion of the number of participants, inclusion and exclusion criteria, sampling procedures, and recruitment for this study. The target population was job coaches working in employment settings with adults with ASD who are minimally verbal or nonverbal. Utilizing purposive sampling, the plan was to recruit up to 40 job coaches working with adults with ASD. The final sample was 22. Purposive

sampling, a type of nonrandom, nonprobability sampling, was chosen to ensure the job coaches enrolled in the study met specific criteria (e.g., number of years of experience, educational background, and prior experience working with adults with ASD). Ensuring preset criteria for inclusion in the study helped establish a more representative sample of job coaches and increased the relevance and meaning behind the data collected (Terrell, 2016).

Job coaches were recruited from organizations offering employment and employment services supported by vocational rehabilitation and included private job coach practitioners working outside of the vocational rehabilitation system. Recruitment was conducted through a variety of email blasts, including a research recruitment flyer, newsletters, social media posts, websites, word of mouth from individuals and organizations across the United States, and peer nomination. For job coaches to be considered participants for this research study, specific criteria must be met: (a) a bachelor's degree in special education, vocational rehabilitation, mental health counseling, social work, or related field; (b) at least one PD activity or course related to the nature and characteristics of ASD; (c) proficiency in reading, writing, and speaking English to a level in which the participants could provide informed consent; (d) vision and hearing within normal limits or corrected to within normal limits allowing the ability to read text, watch videos, and listen to videos; (e) access to a computer with Microsoft Office PowerPoint, standard video-playing software, and internet connection compatible with Zoom video-conferencing software; and (f) the ability to dedicate up to 2.5 hours to participate across two sessions within 2 weeks in this study. Job coaches were excluded if they met any of the following exclusion criteria: (a) reported any history of unethical



behavior or poor performance on the job; (b) reported they were not currently employed; (c) reported 1–2 years until anticipated retirement; (d) reported a history of having more than three different job coach positions for separate organizations within 2 years, pre-COVID-19; (e) self-disclosed a documented disability impacting critical thinking, communication skills, or their physical ability to support an individual with ASD across a variety of job duties; or (f) were a direct report to the researcher in their place of employment.

An additional type of participant in this study was expert reviewers. The role of the expert reviewers was to provide a critical analysis of and feedback on the draft training materials and assessment instruments. Three experts across fields of speech-language pathology or AAC, applied behavior analysis, special education, and vocational rehabilitation were included. Experts with the following skills and characteristics were selected: (a) have 10 or more years' experience in the field of ASD and related disabilities, (b) have leadership roles and responsibilities within autism-based organizations, and (c) maintain current currency in professional development and service.

### **Instruments**

Three instruments were used to obtain the data needed to answer the research questions. Research Question 1 was answered with data from a pretest–posttest knowledge assessment (see Appendix A). The knowledge assessment measured the variable of knowledge of EBPs. Research Question 2 was addressed by the Usage Rating Profile-Intervention Revised (URP-IR), which measured the variable of self-efficacy. The Evidence-Based Practice Attitude Scale-36 (EBPAS-36) was used to measure the variable of participants' beliefs, to answer Research Questions 3 and 4.

To identify changes in participants' understanding of key content, the researcher created a pretest and posttest knowledge assessment derived from the content of the training. The knowledge assessment included approximately 20 multiple-choice questions (see Appendix A). The test specifications for these instruments included questions broken down across five primary key content areas in the training. Key content areas assessed within the measure were an overview of job coaching adults with ASD in employment (20%); an overview of BST, the steps involved, and applicable skills (40%); EBP (to include workplace accommodations) supporting success in employment (20%); AAC strategies and systems (15%); and resource agencies supporting employment for adults with ASD (5%). The development of these test items was guided by (a) the content outline for the training, (b) a review of the literature on employment in adults with ASD and up-to-date EBPs for individuals with ASD, (c) consideration of Bloom's taxonomy, (d) an interview with a statistics consultant, and (e) the researcher's background knowledge and experience.

Bloom's taxonomy is a classification system based on a person's understanding level necessary for learning success (Boon & Lin, 2014). This taxonomy consists of six primary levels: (a) knowledge, (b) comprehension, (c) application, (d) analysis, (e) synthesis, and (f) evaluation. Questions developed within the assessment fell into Bloom's categories of knowledge, comprehension, and application. The use of Bloom's taxonomy structured the assessment in a manner that promoted critical thinking, enhancing the process of learning across learning styles and levels of competency (Boon & Lim, 2014). Due to all questions written in the form of multiple choice with the level of difficulty maximizing out at application of knowledge, it is estimated that participants

would complete the knowledge-based assessment within 10–15 min.

The knowledge assessment was sent to content-area experts to evaluate and provide feedback on the draft. All expert feedback was submitted using the Expert Reviewer Feedback form (see Appendix B). Revisions were informed by the expert reviewers' feedback before finalizing the assessment.

The EBPAS-36 by Rye et al. (2017) measures changes in belief systems on learning about and using EBPs. In the current study, the EBPAS-36 provided information on how the provision of EBPs positively impacted participants' beliefs about the potential for adults with ASD who are minimally or nonverbal in obtaining and maintaining successful employment. The EBPAS-36 is a brief and pragmatic measure of attitudes to EBPs, shortened from the EBPAS-50 created by Aarons (2012). The EBPAS-36 has been validated in the United States and Norway. The U.S. EBPAS-36 total scale Cronbach's  $\alpha$  was .80, with subscale  $\alpha$  ranging between .60 and .91 (Rye et al., 2017). Though the lowest  $\alpha$  at .60 could be considered questionable, the remaining subscales had Cronbach's  $\alpha$  above .70, representing acceptable to excellent levels of internal consistency. The lower  $\alpha$  values when compared to the EBPAS-50 were expected due to the removal of questions in creating a shorter, more user-friendly scale. The EBPAS-36 had adequate psychometric properties in U.S. and Norwegian samples, thus indicating cross-cultural validity (Rye et al., 2017).

The URP-IR by Chafouleas et al. (2011) evaluates factors related to intervention implementation. The URP-IR has subscales for assessing (a) acceptability, (b) feasibility, (c) home–school collaboration, (d) system climate, and (e) systems support. The URP-IR was created to expand on and strengthen subscales within the original Usage Rating

Profile–Intervention instrument created by Chafouleas et al. (2009). Subscale reliability coefficients have been found to be adequate to strong, ranging from .67 to .95 across the six subscales (Briesch et al., 2013). A modification of the URP-IR was used in the current study to look at self-efficacy among job coaches working with adults with ASD in employment. Permission from the authors was granted for this modification. A copy of the correspondence granting this permission can be found in Appendix C (S. Chafouleas, personal communication, August 10, 2020). The URP-IR adapted for job coach participants is shown in Appendix D.

## **Procedures**

This section provides detailed information on the research design and an explanation of project phases within the study from recruitment to implementation. Data collection and analysis procedures, the researcher's role, and anticipated limitations also are discussed.

## ***Design***

The study utilized a one-group pretest–posttest quasi-experimental design. In this research design, the same dependent variables were measured in a single group of participants prior to (pretest) and following (posttest) the administration of treatment (training). Potential changes in job coaches' knowledge, perceived self-efficacy, and belief system were measured using the assessment instruments previously described. This design permitted a comparison of data from pre- to posttraining in the absence of a control group. The design also allowed for analysis of data obtained with nonrandom sampling procedures (Creswell, 2019).

The study included a three-phase process. The first phase focused on developing

the materials and gaining content validity, as well as recruiting and selecting project participants. Expert reviewers who worked in the field of speech-language pathology or AAC, special education, ASD, applied behavior analysis, and vocational rehabilitation were asked to validate the content of the training and assessment materials for accuracy before the training was delivered to job coach participants. Expert reviewers provided written feedback on the training content and structure using a training review questionnaire developed for this study (see Appendix B). Experts also reviewed and made recommendations on the researcher-generated assessment to ensure the integrity of the questions, alignment with the content, and overall effectiveness of the assessment tools.

The second phase of the study focused on administering the pretest assessments, providing online training for the job coach participants, and administering posttest assessments. Pretest measures were accessible before the onset of the online training. Each participant then viewed the online prerecorded training. Participation was monitored and tracked via the online training system. Posttest measures were made available and expected to be completed within 1 week following the training.

The third phase of this study included analysis, results, and reflection. Results were analyzed from the pre- and posttraining knowledge assessment, the URP-IR (Chafouleas et al., 2011), and the EBPAS-36 (Rye et al., 2017). Further, the time it took job coaches to complete the training, an account of any attrition, and information on the overall perception of the training process were analyzed across the two time points. Results then were reported and included reflections on the study's limitations and recommendations for further research.

### ***Project Phases***

**Phase 1: Recruitment and Selection.** The researcher began recruiting participants by creating a research recruitment flyer. Once created and approved, the recruitment flyer was shared with willing vocational rehabilitation offices, vocational rehabilitation vendors providing employment support for adults with ASD, other local agencies, and employers who have hired adults with ASD. The organizations disseminated the recruitment flyer via social media, email blasts, newsletters, and word of mouth. Recruitment flyers included information on the study and inclusion criteria to ensure all interested participants understood whether they were a fit for the study. Interested participants contacted the researcher via email.

Once potential interested participants were deemed eligible, an email was sent to those participants explaining an overview of the study. This email included a consent form to participate. Consent forms provided information on (a) the research, (b) potential benefits, (c) the participant's right to participate and withdraw from the study at any time, (d) confidentiality of personal information, and (e) the options to pose questions at any time. Once participants read the form, acknowledged understanding of the study and their role, and indicated they would like to participate, consent forms were signed and returned to the researcher via a secure online file.

Confirmed and consented participants were contacted by email 1 week before the first scheduled date for the research study. A rolling entry method was utilized for eligible participants to participate in the study. A rolling entry helped to support active engagement in the training upon interest and therefore limited the risk of attrition. Reminders about the study's participation guidelines; a thank you note for participating in

the study; and details on what to expect during the pretest, training, and posttest time points were included in this correspondence. A reminder email was sent the day before the study to ensure participants remembered to log in on the scheduled date. The hyperlink to the online training, login information, and access to the pretests were made available to participants on Day 1 of the study. Interested but ineligible participants received an email describing reasons for ineligibility and a list of resources on EBPs for autism, to include links to a free employer training webinar series.

**Phase 2: Preparation and Implementation.** In developing the content for the online training and in developing the knowledge-based pre- and posttest assessment, the researcher worked with a preselected group of experts across fields of speech-language pathology and AAC, applied behavior analysis, special education, and vocational rehabilitation to gain a critical analysis of and feedback on the draft training materials and assessment instruments. As stated above, three experts from each field were asked to review a draft of the training. Training content included an overview of job coaching adults with ASD; EBPs for individuals with ASD (e.g., accommodations and modifications in the workplace); a comprehensive review of the BST approach, to include the supporting research; and video case examples demonstrating step-by-step use of the BST approach to support the complex communication needs of adults with ASD in employment. Resources on community and state agencies supporting employment for adults with ASD and other developmental disabilities also were included within the training.

Strategies known to increase the efficacy of online PD were infused throughout the online training process. Such strategies include learning that is meaningful and

purposeful; learning experiences supporting internal motivation, aligned with sense of self and with one's positive past experiences; and learning that is visual, auditory, and kinesthetic. A structured feedback form was shared to control the format in which feedback across expert reviewers was provided. The expert reviewers were asked for feedback on any modifications to make to the structure, graphics, and format of the slides. Further reviewers were asked to provide feedback related to any questions they felt should be added, deleted, or changed across topic areas within the knowledge assessment. The expert reviewers had up to 2 weeks to review the draft training and assessment material and return feedback forms to the researcher. Feedback forms were uploaded to a secure online file. The researcher sent reminder emails after 1 week and then again 2 days prior to the deadline for feedback to be completed. Once feedback from the expert reviewers was received, necessary changes were made, and a revised draft of the assessment and training materials was created.

The revised draft of the training, to include the script used in the prerecording process and the assessment materials, was sent to the panel of expert reviewers to provide further feedback. Feedback was provided using the same structured feedback form as in the first review. All feedback was uploaded to the same secure online file as in the outline stage of development. Expert reviewers again had up to 2 weeks complete this process. Following the expert reviewer feedback being collected, further revisions were made, and the training and assessments were finalized. The final versions of the pretests and online training were uploaded to an online training platform to establish hyperlinks and logins for the participants.

The study began by having the participants log in to the secure online training



site, using the password-protected login information provided. A password-protected login ensured only confirmed and consented participants engaged in the study and the anonymity of personal information. After logging in, pretests were taken assessing (a) knowledge of EBPs in job coaching adults with ASD, (b) self-efficacy related to the participants' feelings about their own capacity to support adults with ASD in the workplace, and (c) the participants' beliefs about the benefits of using EBPs when supporting adults with ASD in employment. The completion of the pretest assessments unlocked the training.

As mentioned, the training was presented in a prerecorded, asynchronous fashion, allowing participants to engage in the training at a location of their choice and in their own time frame across 2 weeks. Content again covered background information on job coaching adults with ASD, a detailed review of BST and the application of BST in employment, EBPs for individuals with ASD, an overview of AAC strategies supporting successful employment, and a list of recognized resource agencies supporting employment for adults with ASD. Case study presentations, visual supports, and video examples of the strategies were embedded throughout the training. Participants engaged in self-directed learning check-in points including questions guiding application of the content. Correct responses to all questions were provided to guarantee information was presented in an error-free manner. To further encourage engagement in the training, encouraging messages and positive reinforcement were sent to the participant through the secure online portal. An increase in positive behavior support or reinforcement was provided to participants showing signs of decreased engagement (e.g., days between login times, increased length of time on one slide). In total, the pretests and training were

designed to not exceed 2.5 hours in length.

Following the completion of the pretests and training, participants were provided with up to 1 additional week before needing to complete the posttest measures. Posttest measures were available on the same secure online platform as the pretests and training. An email reminder was sent to the participants 2 days prior to the posttest deadline. Certificates of participation to include earned continuing education units corresponding to the professional needs of job coaches and an embedded resource package were made available for download once all posttest measures were completed. A spreadsheet, in addition to the data gathered within the secure online training platform, was utilized by the researcher to import the information gained from the pretest and posttest measures.

**Phase 3: Analysis, Results, and Reflection.** All data collected were quantitative in nature. The data collected by the researcher from the knowledge, self-efficacy, and belief systems pretest and posttest measures were imported from the researcher's spreadsheets into a secure location to analyze via SPSS. Results were both graphed and described in a narrative format. All data, per the Institutional Review Board regulations, will be stored for 3 years following the completion of the study and then destroyed.

### ***Data Collection Procedures***

Phases 1 and 2 of the study involved data collection, as described above. The data collection methods were aligned with each of the research questions. Research Question 1 was answered using a pretest and posttest knowledge assessment derived from the content of the training. Research Question 2, which looked at changes in reported self-efficacy, was addressed by utilizing the pre- and posttraining URP-IR (Chafouleas et al., 2011). Research Question 3, assessing correlation between increase in knowledge of

EBPs and change in belief systems, was answered by using the EBPAS-36 (Rye et al., 2017) as well as change in scores on the knowledge assessment. Research Question 4, which looked at correlation between job coaches' self-efficacy and reported beliefs about their clients' potential for successful employment, was addressed using data from the posttest URP-IR and the posttest EBAS-36. These tools were employed to measure the change in knowledge following the training and the impact an increase in knowledge has on coaches' perceived self-efficacy and belief system towards working with adults with ASD who are minimally verbal or nonverbal.

### ***Data Analysis Procedures***

All quantitative data were recorded, analyzed, graphed, and reviewed by the principal investigator at the beginning and end of the training process. A visual analysis of the data illustrated any progress or changes in the participants. In this study, the researcher used both ordinal and interval levels of measurement.

**Knowledge Assessment.** Tests measuring knowledge often use interval data (Creswell, 2019). Therefore, the researcher collected interval data on the knowledge-based assessment created for this study. In an interval level of measurement, values have order, values represent positions along continuous number lines, intervals are considered meaningful, and there is a constant interval or equal distance between two values. Interval data appear in the form of numbers or numerical values and follow a normal distribution. Data following a normal distribution are best analyzed using parametric statistics. Parametric statistics make assumptions about the distribution of data from the underlying population and the many defining properties (Creswell, 2019; Trochim & Donnelly, 2006). Parametric statistics assume distributions of data are normal. A paired-

sample  $t$  test, one of the most common parametric tests, was used to compare the data (means) across pretest and posttest scores on the knowledge assessment.

To establish construct validity of the knowledge assessment, an exploratory factor analysis was conducted. Exploratory factor analyses are recommended for newly developed instruments to ensure the questions included in the assessment measure the intended areas of knowledge. An exploratory factor analysis explores how responses to individual items seem to cluster together. Based on this type of clustering, a researcher can determine that similar responses to a group of items indicate the presence of underlying factors that fit the overall questionnaire. An exploratory factor analysis was conducted to examine the ideal factor solution for this novel questionnaire. A five-factor solution was hypothesized to best fit the data, which included background info, BST, EBP, AAC, and workforce (see Bryant & Yarnold, 1995). Internal consistency for each of these factors was examined using Cronbach's alpha (Creswell, 2019; Edmonds & Kennedy, 2017).

**Self-Efficacy and Belief System Assessments.** The self-efficacy and belief system assessments use Likert scale data with analyses based on sum or mean scores (Boone & Boone, 2012). These data are commonly treated as interval data despite technically using an ordinal scale. However, they also can be considered ordinal data and analyzed using the appropriate statistics for that level of measurement (Creswell, 2019). Ordinal data can be ordered or ranked, but the distance between each interval can be variable and may not be fixed (Allen & Seaman, 2007; Creswell, 2019). The differences between two values on a Likert scale (e.g., the differences between *always* and *often*) may not be the same as the difference between two other values (e.g., *often* and

*sometimes*). This potential difference in value intervals impacts the distribution of data, meaning that nonparametric statistical approaches are required (Creswell, 2019; Sullivan & Artino, 2013).

In reviewing previous research on the URP-IR, Briesch et al. (2013) explored the normality of the distributions for each of the individual items (15 in total) across 1,005 elementary school teacher respondents. They found a high degree of skewness in a number of these items. They used a cutoff of (skewness score)  $\pm 3$  to determine the presence of excessive skewness in the items. Because of the disagreement on whether to classify Likert-type data as ordinal or interval level (Carifio & Perla, 2007) and the degree of skewness identified, the data were treated as ordinal for the exploratory and confirmatory factor analyses conducted on this sample. Briesch et al.'s study had a large population and found skewed responses to a number of the items on the questionnaire; therefore, the data in this study were treated as ordinal and analyzed using nonparametric tests (see Briesch et al., 2013; Creswell, 2019; Sullivan & Artino, 2013). Distribution of data for each item as well as the six subscales was checked prior to analysis to confirm this pattern in the sample (Briesch et al., 2013).

Because the data were anticipated to not be normally distributed, the Wilcoxon signed-rank test, a nonparametric test used to compare median scores across two time points (pretest and posttest scores) was employed. When executing this test, the researcher must (a) calculate the difference score from each pair of scores, (b) rank the scores from high or low or low to high, (c) assign a + or – to each rank, (d) calculate the  $W^+$  and  $W^-$  ranks, and (e) report the ranks as z values. The Wilcoxon signed-rank test was used to compare scores from the perceptual constructs (self-efficacy and belief

systems) across pretest and posttest measures to determine if a change occurred as a result of participants' engagement in the PD training (Huck, 2012). Cronbach's coefficient alpha was computed for this measure. Cronbach's coefficient alpha is a standard measure for internal consistency or reliability, especially when using Likert scale surveys (Creswell, 2019; Edmonds & Kennedy, 2017; Sullivan & Artino, 2013; Taber, 2018).

Prior research on the EBPAS-36 helped determine whether the data resulting from this study should be treated as ordinal and analyzed using a nonparametric test just as in the URP-IR. In reviewing Hitch (2016), in which 41 occupational therapists completed the EBPAS, the subscore mean data were classified as interval because of the five categories for response (without a neutral response). However, the overall mean scores across participants were not normally distributed, so Hitch ran nonparametric tests (i.e., Kruskal-Wallis one-way analysis of variance and Mann-Whitney U tests).

Though prior studies using the EBPAS-36 have utilized parametric statistics in analyzing research questions related to this instrument (Rye et al., 2017), given that the individual items and scales of the EBPAS-15 are commonly skewed (Hitch, 2016), a more conservative nonparametric approach is justified. Therefore, in this study, the researcher collected ordinal data on the EBPAS-36, again using the Wilcoxon signed-rank test to analyze results. The data were screened before the analyses to confirm the current sample pattern. Further examination, using Cronbach's coefficient alpha, again was executed to ensure a standard measure for internal consistency was included (Sullivan & Artino, 2013; Taber, 2018).

**Correlational Analysis of Knowledge, Self-Efficacy, and Belief Systems.** To examine the correlation between knowledge and beliefs and the correlation between self-efficacy and beliefs (Research Questions 3 and 4), a linear regression model was used. Linear regression analysis estimates parameters in a linear equation that can be used to predict one variable's values based on the other. Two linear regression models were conducted to determine whether changes in job coaches' knowledge of EBPs and job coach's self-efficacy of EBPs accounted for significant variation in changes in their reported beliefs about their clients' potential for successful employment. In both models, change in reported beliefs about potential for successful employment of individuals with ASD who are minimally verbal or nonverbal was the outcome variable. In Model 1 (Research Question 3), change in knowledge was the predictor, whereas change in self-efficacy was the predictor in Model 2 (Research Question 4). The predictor coefficients as well as the coefficients of determination were reported for both models (Allison, 1990; Montgomery et al., 2012). This approach for analyzing continuous predictors of pretest-to-posttest change was deemed suitable in Farmus et al. (2019).

## **Chapter 4: Results**

This chapter includes the psychometrics of the three instruments and the statistical analyses used to answer the four research questions:

1. To what extent did the job coaches increase their knowledge of EBPs in using a BST approach to facilitate communication in response to the BST PD?
2. To what degree did the job coaches increase their reported self-efficacy in utilizing EBPs in using a BST approach to facilitate communication in response to the BST PD?
3. Was there a positive correlation between increases in job coaches' knowledge of EBPs and job coaches' reported beliefs about their clients' potential for successful employment?
4. Did the data indicate a positive correlation between increases in job coaches' self-efficacy of EBPs and job coaches' reported beliefs about their clients' potential for successful employment?

Quantitative data analyzed using IBM SPSS across both parametric and nonparametric measures are reported. Primary statistical tests employed included the paired-samples *t* test, Cronbach's alpha test, Wilcoxon signed-ranks test, linear regression, and Pearson's correlation coefficient.

The purpose of this one-group quasi-experimental design study was to advance the field of job coaching by developing an online PD teaching the use of BST (i.e., a prescribed set of EBPs for teaching individuals with ASD) to facilitate communication in the workplace. The study was a field test of the effect of using online training to support job coaches who work with adults with ASD who are minimally verbal or nonverbal. The



study included a three-phase process. The first phase focused on recruitment and selection of eligible participants. The second phase included developing the materials, gaining content validity, implementing the pretest assessments, providing the online training, monitoring participation, and administering posttest assessments. Once the study was complete, the third phase included analysis, results, and reflection.

### **Phase 1: Recruitment and Selection**

Recruitment for the study took place over 2 months. Job coaches were recruited from both the private sector and from organizations offering employment and employment services supported by vocational rehabilitation. Recruitment was conducted through a variety of email blasts, including a research recruitment flyer, newsletters, social media posts, websites, word of mouth from individuals and organizations across the United States, and peer nomination. Over 80 different individuals across approximately 60 agencies were contacted directly by the researcher. Several of these individuals and agencies shared the research recruitment flyer within and outside of their own networks. Though the number of indirect connections made during the recruitment period is not quantifiable, qualitatively it can be postulated that the expansive list of individuals and agencies supporting the recruitment process was likely responsible for the study recruiting an adequate sample of eligible job coaches.

Due to the need for more time than initially anticipated, an amendment to the Institutional Review Board was submitted and approved. The amendment focused on modification of initial time frame restrictions placed on recruitment and participant completion of study activities. Additional time for recruitment was necessary for several reasons. One of the primary reasons was the variety of backgrounds of job coaches. As

the profession of job coaching is still emerging, job coaches have various educational backgrounds. Eight of the 48 (17%) professionals interested in participating did not meet eligibility based on their degree not meeting primary or related field criteria. Few organizations and agencies have published defined standards for PD specific to job coaches, and there is no consensus on the need for ongoing PD. As job coaches are not typically required to participate in PD events, they may be less likely to enroll in continuing education. Therefore, they also may be less engaged in the PD activities they join. This phenomenon was seen during the study, as 8 of the 40 (20%) eligible job coaches who requested to enroll and received enrollment letters did not log in to the training to consent or begin. Of the 32 registered and consented participants, 5 (16%) who consented and started the study did not finish, even with the provision of weekly messages of encouragement sent out by the researcher. Of the 27 job coach participants agreeing to and remaining engaged throughout the study, only 22 (81%) of the participants followed all directions, ending the training with complete data sets. Weekly messages of encouragement, friendly reminders of due dates, and direct access via phone and email to the researcher for technical support were essential components supporting continued motivation and engagement.

## **Phase 2: Preparation and Implementation**

Before implementation of the study, numerous steps were taken to establish content validity, evaluate the design, and assess the feasibility of the online training materials. The content-area expert review to validate the assessment and training materials was implemented in two steps.

The first step included content-area expert reviewers evaluating an initial draft of

the online pretest, posttest, and training materials. Nine expert reviewers were recruited based on their backgrounds in social work, psychology, or applied behavior analysis ( $n = 3$ ); special education or education ( $n = 2$ ), or speech-language pathology ( $n = 3$ ).

Reviewers had expertise in adults with ASD, AAC, behavior skills training, or supported employment. Five held a doctorate, and four had a master's degree. Expert reviewers were provided with an expert reviewer feedback form to ensure consistency in the type and format of feedback provided. The expert reviewer feedback form included a series of questions, with 24 of the 27 questions based on a 3-point scale of *yes*; *yes, but needs work*; and *no* to ensure the review feedback could be completed on time. Each question also included a comments section to gather qualitative information. Three of the questions were open ended to ensure the reviewers could provide feedback not captured by the initial set of questions. Side-by-side viewing of the presentation materials and the feedback form was used to promote accurate and detailed responses.

The expert reviewers completed their initial review over 2 weeks. Reviews were completed in 7–14 days with a mean time of completion of 12 days. Expert reviewers uploaded completed feedback forms to the secure Moodle online training platform. Reminder emails and messages of encouragement were sent after 1 week and then again 2 days before the deadline for feedback. The expert reviewers' feedback was combined and addressed. Initial revisions took into consideration the majority point of view. The reviewers provided feedback related to terminology ( $n = 8$ ), enhanced examples ( $n = 6$ ), flow ( $n = 5$ ), cohesion ( $n = 5$ ), relevancy to job coaches ( $n = 4$ ), video presentations ( $n = 4$ ), and resources ( $n = 4$ ). A revised draft of the assessment and training materials, including a video-recorded presentation and written script corresponding to the training

presentation, was created based on the expert reviewer feedback.

In the second step of the expert reviewer process, the researcher emailed the expert reviewers indicating the revised assessment and training materials were ready for their second review. Feedback was provided using the same structured feedback form as in the first review (see Appendix B). Feedback forms, once complete, were uploaded to the same secure online Moodle folder as in the first step. Expert reviewers took between 9 and 14 days to complete the second review. Final edits again considered the majority point of view with targeted changes continuing to focus on enhanced examples ( $n = 5$ ), resources ( $n = 4$ ), video presentation ( $n = 3$ ), relevancy to job coaches ( $n = 2$ ), flow ( $n = 1$ ), cohesion ( $n = 1$ ), and terminology ( $n = 1$ ). Proposed revisions were discussed with the dissertation advisor to determine how best to address the expert reviewers' comments. Following the researcher's review of the expert reviewer feedback and discussion with the dissertation chair, further revisions were made, including additional enhancements to the examples and resources. Final versions of the assessment tools and training materials were created and made available to the participants on the project's online platform.

The final training materials were divided into multiple subsections, including an agenda, learning objectives, an introduction, six focused content lessons, three knowledge checks, interactive case-based practice opportunities, resources, and a downloadable workplace resource packet. The training provided audio and visual instructions on how to toggle between the course menu and text transcripts of the audio and video presentations. There were 10 segments of video presentations across the training: one success story, three transactional videos, and six minilessons). These ranged in length from 2.5 min to 33 min, with the average being 13 min. Videos of case examples and strategy

demonstrations were embedded into the six minilessons.

To emphasize actionable content, implementation-related tips were included in the form of a call-out box or banner to capture the participants' attention. Knowledge checks included after each lesson allowed the participants to review information learned in an interactive manner. Interactive participation was provided in way of drag-and-drop answers into fill-in-the-blank content boxes. Once a participant matched each answer with the corresponding content, the program would indicate if the knowledge check was completed successfully or if the participant needed to try again. Participants could move forward to the next lesson once they successfully completed their knowledge check. To further support engagement in learning, interactive review tiles and an interactive checklist paired with video-based case scenario practice opportunities were also included throughout the training. Transition slides labeling each section were embedded to support flow, cohesion, and predictability.

Once complete, the final versions of the assessments and online training were uploaded to the Moodle online training platform, and recruitment was initiated. Interested and eligible participants were sent login information to access the consent and begin the course. After consenting, the job coach participants required extended time to complete the study-related activities due to the direct impacts of the COVID-19 pandemic on their job. Engaged participants actively communicated with the researcher upon any delay arising. Those requesting extensions consistently shared a desire to stay involved. Requests were specific to increased time frames or flexibility of time frames. Reasons for proposals for an extended time to complete study-related activities included (a) extended work hours due to an influx of clients needing to find new jobs due to COVID-19, (b)

unexpected work need to cover for another job coach due to exposure to COVID-19, (c) illness negatively impacting a job coach's ability to work, (d) decreased time for PD activities due to increased paperwork secondary to COVID-19 policies and procedures, and (e) increased time in the car without access to a computer with internet due to COVID-19 procedures requiring extra time between client visits. Removal of maximum time frames and increased flexibility of timing to complete study-related activities increased engagement in the training process. Consequently, even with eligibility issues and attrition, 22 participants stayed engaged and supported the gathering of meaningful data. Once the participants completed all study-related activities to include the final three posttests, certificates of participation with continuing education units corresponding to the professional needs of job coaches and an embedded workplace resource packet became accessible for download.

### **Phase 3: Analysis**

The data collected by the researcher from the knowledge, self-efficacy, and belief systems pretest and posttest measures were extracted from Moodle into a secure Excel file for ease of data analysis through IBM SPSS. The analyses of these data are shared in a subsequent section.

The pretest collected demographic information about the job coaches and expert reviewers who participated in the study. Out of 27 participants, 22 (81%) of the job coach participants completed the study in full. Characteristics of the participants are presented in Table 1. The job coaches consisted of 19 (86%) women and 3(14%) men. All participants were proficient in English. According to the pretest, the majority of the participants had a bachelor's degree in social work, psychology, applied behavior

analysis, vocational rehabilitation, or another related field. In regard to years of experience, the range was primarily split between participants at the beginning of their career with 1–3 years of experience and job coaches with 10 or more years of experience.

**Table 1**

*Characteristics of the Job Coach Sample (N = 22)*

Characteristic	<i>n</i>	%
Gender		
Female	19	86.4
Male	3	13.6
Field of study		
Social work, psychology, applied behavior analysis	8	36.4
Vocational rehabilitation, other related field	7	31.8
Special education, education	4	18.2
Speech-language pathology	3	13.6
Highest degree		
Bachelor's	10	45.5
Master's	7	31.8
Doctoral	3	13.6
Years of experience/work experience with autism spectrum disorder (ASD)		
1–3	8	36.4
3–5	3	13.6
5–7	2	9.1
10+	9	40.9
Experience with adults with ASD who are minimally verbal or nonverbal	19	86.4
Experience with augmentative and alternative communication (AAC)	14	63.6
Professional development in ASD with AAC	12	54.5
Professional development in ASD with behavior skills training	17	77.3

Job coaches with prior experience in ASD equated to 19 (86%) of the participants, with 14 (64%) also having experience with AAC. When looking at a history of PD in the areas of AAC and BST, 12 (55%) of the job coaches reported having engaged in PD for AAC, and 17 (77%) of the job coaches had a history of continuing education related to BST. A summary of the demographic data collection is provided in Table 1.

### **Data Analysis**

Results are provided individually for each research question posed for this study. Statistical analyses are included for data obtained to address each question.

#### ***Research Question 1***

To what extent did the job coaches increase their knowledge of EBPs in using a BST approach to facilitate communication in response to the BST PD? Research Question 1 was addressed using the knowledge assessment. Pre- and posttest data were collected from 22 participants. Pretest data were higher than expected in that 32% percent of participants scored 90% or above on the pretest (including one participant who achieved a perfect score at pretest). Scores that approach ceiling before the intervention means there is less room to evaluate the impact of training. All other participants improved from pretest to posttest.

A paired-samples *t* test was conducted to examine changes in job coaches' knowledge following the online training. Knowledge was improved from pretraining levels ( $M = 16.09$ ,  $SD = 2.18$ ) to posttraining ( $M = 18.27$ ,  $SD = 1.73$ ). The test showed that this improvement was statistically significant with a large effect size,  $t(21) = -5.48$ ,  $p < .001$ ,  $d = 1.87$ . These statistics indicate that job coaches significantly increased their knowledge of EBPs in using a BST approach to facilitate communication. See Table 2



and Figure 1.

**Table 2**

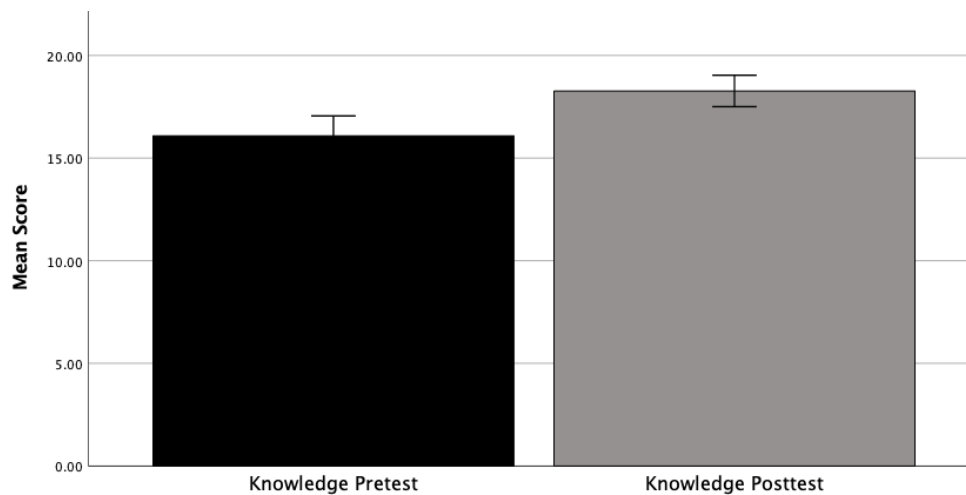
*Paired-Samples *t* Test of Knowledge Pre- and Posttest (N = 22)*

Knowledge assessment	Mean	% correct	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>
Pretest	16.09	80.5	2.18	-5.48	21	< .001	1.87
Posttest	18.27	91.4	1.73				

*Note.* Mean scores are out of a possible total of 20.

**Figure 1**

*Pretest to Posttest Knowledge Scores*



*Note.* *N* = 22. The confidence interval was 95% for errors in both the pre- and posttest.

Cronbach's alpha test was conducted to examine the internal consistency in the knowledge assessment. The test revealed a moderate fit,  $\alpha = .53$ . Cronbach's alpha test was conducted to examine the internal consistency in the URP-IR for Job Coaches at the pre- and posttest time points. The tests revealed strong fits at baseline,  $\alpha = .74$ , as well as posttraining,  $\alpha = .86$ . Cronbach's alpha test was conducted to examine the internal consistency in the EBPAS-36 item. The test revealed strong fits at baseline,  $\alpha = .75$ , as

well as posttraining,  $\alpha = .88$ . See Table 3.

**Table 3**

*Cronbach's Alpha Test*

Test	Number of items	Cronbach's alpha
Knowledge pretest	20	.53
Knowledge posttest	20	.38
URPI-IR pretest	19	.7
URPI-IR posttest	19	.86
EBPAS-36 pretest	36	.75
EBPAS-36 posttest	36	.88

*Note.* URPI-IR = Usage Rating Profile-Intervention Revised for Job Coaches.  
EBPAS-36 = Evidence-Based Practice Attitude Scale-36.

A factor analysis was conducted with a varimax rotation to examine the ideal factor fit solution for the 20-item knowledge assessment. The analysis could not be completed because question nine had no variation in the outcomes due to everyone answering this question correctly. For future implementation, this item could be modified in complexity. As an exploratory analysis, Question 9 was removed, and the factor analysis yielded a five-factor solution, due to the presence of five factors with eigenvalues greater than 1.5. This was in line with the hypothesis that multiple factors would be encompassed by this instrument.

***Research Question 2***

To what extent did the job coaches increase their reported self-efficacy in utilizing EBPs in using a BST approach to facilitate communication in response to the BST PD? Research Question 2 was addressed by the URP-IR, which measured the variable of self-efficacy. A 19-item version of the URP-IR adapted for job coaches was analyzed in this

study, although traditionally a 29-item version of the URP-IR is used. The shortened version of this instrument was used due to data loss that appeared to be connected to an incompatible and automatic update made in the backend system of Moodle. In examining the results, the findings were still considered valid on the 19-item version of the URPI-R due to the minimal difference between the average scores across versions. Specifically, the average ( $M = 4.5$ ) from the 29-item version compared to the average ( $M = 4.6$ ) from the 19-item version ( $p = .44$ ) underscores the minimal difference and therefore helps validate the meaningfulness of the data analyzed on the URP-IR for Job Coaches 19-item measure.

A Wilcoxon signed-ranks test was conducted to examine whether the training led to significant changes in self-efficacy. The test for self-efficacy showed that the mean posttest score ( $M = 4.95$ ,  $SD = 0.48$ ) was significantly greater than the mean pretest score ( $M = 4.56$ ,  $SD = 0.31$ ),  $W = 194$ ,  $p = .006$ . These results show that the training was sufficiently powerful to correlate with increased self-efficacy. See Table 4 and Figure 2.

**Table 4**

*Wilcoxon Signed-Ranks Test for Change in Self-Efficacy*

Self-efficacy	Mean	<i>SD</i>	<i>W</i>	<i>df</i>	<i>p</i>	Effect size
Pretest	4.56	0.31	194	21	.006	.59
Posttest	4.95	1.73				

*Note.* Self-efficacy measured using a 19-item version of the Usage Rating Profile-Intervention Revised modified for job coaches.  $N = 22$ .

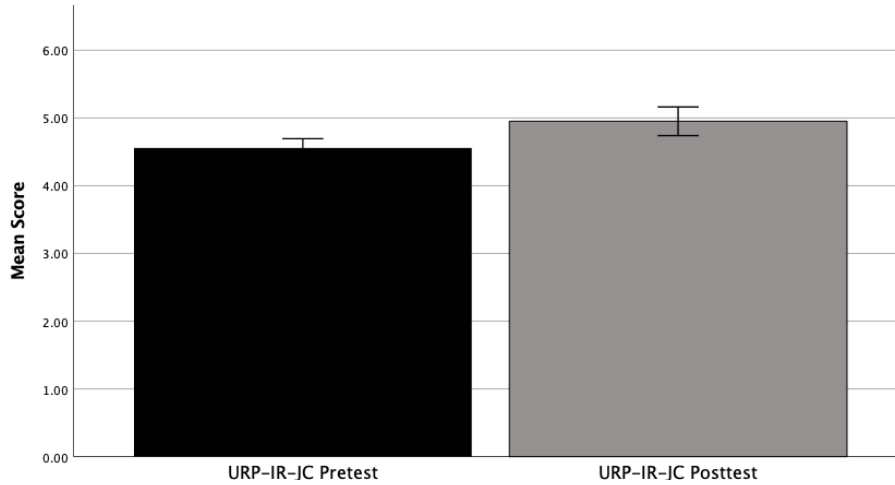
### ***Research Question 3***

Was there a positive correlation between increases in job coaches' knowledge of EBPs and job coaches' reported beliefs about their clients' potential for successful

employment? Research Question 3 was addressed by the URP-IR, which measured the variable of self-efficacy.

**Figure 2**

*Pretest to Posttest Scores on Self-Efficacy Measure*



*Note.*  $N = 22$ . URP-IR-JC = Usage Rating Profile-Intervention Revised modified for job coaches. The confidence interval was 95% for errors in both the pretest and posttest.

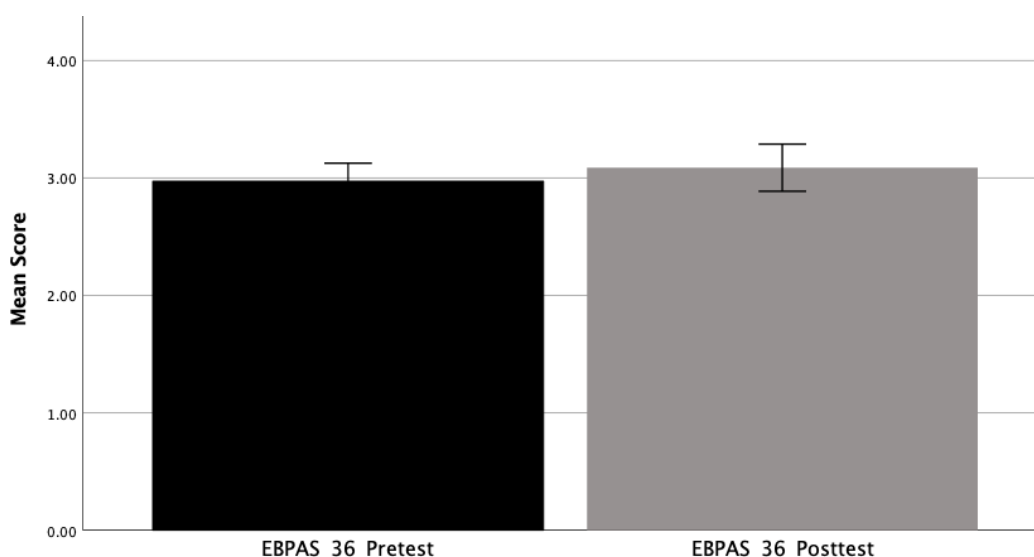
First, a Wilcoxon signed-ranks test was conducted to examine whether the training led to significant changes in belief systems. The test for belief systems showed that the mean posttest score ( $M = 3.09$ ,  $SD = 0.45$ ) was greater than the mean pretest score ( $M = 2.97$ ,  $SD = 0.35$ ),  $W = 182$ ,  $p = .071$ , but the change was not statistically significant. See Table 5 and Figure 3.

**Table 5**

*Wilcoxon Signed-Ranks Test for Change in Beliefs*

Beliefs	Mean	<i>SD</i>	<i>W</i>	<i>df</i>	<i>p</i>	Effect size
Pretest	2.97	0.35	182	21	.071	.25
Posttest	3.09	0.45				

*Note.* Beliefs measured using the Evidence-Based Practice Attitude Scale-36.  $N = 22$ .

**Figure 3***Pretest to Posttest Scores on Beliefs Measure*

*Note.*  $N = 22$ . EBPAS\_36 = Evidence-Based Practice Attitude Scale-36. The confidence interval was 95% for errors in both the pretest and posttest.

Two linear regression models were generated to determine whether (a) changes in job coaches' knowledge of EBPs accounted for significant variation in changes in reported beliefs about a client's potential for successful employment (Research Question 3) and (b) changes in job coaches' knowledge accounted for significant change in reported beliefs. The model predicting changes in reported self-efficacy from changes in job coaches' knowledge did not yield significance  $F(1,20) = .57, p = .46$  (see Table 6). Additionally, the effect size was small,  $R^2 = .03$ . The coefficient predicting job coaches' knowledge was not significant,  $\beta = -.05, t(21) = -.753, p = .46$ . A Pearson's correlation was conducted to examine the association between job coaches' knowledge and reported beliefs. The test was positive, but nonsignificant,  $r = .14, p = .53$ . See Table 7 for details. There was not a significant association between the knowledge of EBPs and reported beliefs such that as knowledge of EBPs increased so did reported beliefs.

**Table 6***Regression Models for Self-Efficacy and Beliefs Based on Change in Knowledge*

Test	<i>t</i>	<i>p</i>	<i>B</i>	<i>df</i>	<i>F</i>	<i>p</i>	<i>R</i> <sup>2</sup>
Change in self-efficacy	-7.53	.46	-.05	(1, 20)	0.57	.46	.03
Change in beliefs	1.46	.16	.13	(1, 20)	2.14	.16	.10

**Table 7***Correlation Among Variables of Interest*

Variable	Change in knowledge	Change in self-efficacy
Change in self-efficacy	-1.7	
Change in beliefs	.14	.31

***Research Question 4***

Was there a positive correlation between increases in job coaches' self-efficacy of EBPs and job coaches' reported beliefs about their clients' potential for successful employment? The regression model predicting changes in reported beliefs from self-efficacy was moderately significant,  $F(1, 20) = 2.14$ ,  $p = .16$  with a small effect size,  $R^2 = .16$  (see Table 6). The coefficient predicting reported beliefs was not significant,  $\beta = .13$ ,  $t(21) = 1.46$ ,  $p = .16$ .

Job coaches demonstrated a marginal or slight increase of their reported self-efficacy in utilizing EBPs in response to the training, thus highlighting that knowledge alone may not be the only component necessary in increasing feelings of self-efficacy, despite being an important factor. A Pearson's correlation was conducted to examine the association between job coaches' self-efficacy and reported beliefs. The test was positive, but nonsignificant,  $r = .31$ ,  $p = .16$  (see Table 7). There was a positive association between these variables such that as self-efficacy increased so did reported beliefs, but

the association was not statistically significant.

## **Conclusion**

Overall, this study supports the use of online professional development training as a way in which to increase the knowledge of job coaches working with adults with ASD who are minimally verbal or nonverbal. A two-phase process for validating the assessments and training materials resulted in a comprehensive, interactive online training to improve job coaches' support of minimally verbal and nonverbal adults with ASD using a BST approach. Twenty-two job coaches participated in the study and completed all study-related activities across time frames ranging from 2 weeks to 2 months. Due to some technical irregularities, there was data loss in one measure (the URP-IR for Job Coaches). As discussed previously, the results of the shortened version were considered valid, despite the reduction in questions (i.e., from 29 items to 19 items). It is unclear whether a full data set from use of the complete URP-IR might have revealed a stronger and therefore more significant relationship between knowledge and self-efficacy.

There were three major findings. First, the participants demonstrated a significant increase in their knowledge based on the content within the online training. Though results revealed significant differences between pre- and posttest data, the pretest scores being higher than expected impacted the potential for growth following the training. Second, self-efficacy increased significantly following the training. Third, an increase in the participants' self-efficacy ratings had a moderately significant relationship with an increase in positive beliefs following the online training. Together, these indicate support for continued investigation for the use of online PD training for job coaches.

## **Chapter 5: Discussion**

### **Overview of the Study**

Helping people with ASD who are minimally verbal or nonverbal be successful in employment has been a longstanding challenge for both job coaches and employers. The purpose of this research study was to advance the field of job coaching by developing an online PD teaching the use of BST (i.e., a prescribed set of EBPs for teaching individuals with ASD) to facilitate communication in the workplace. Such training was designed to support job coaches who work with adults with ASD who are minimally verbal or nonverbal. This training focused on teaching job coaches about the use of a BST approach in supporting individuals who may benefit from or already use AAC. The training was designed and created with the input of content-area experts. The assessment tools and training materials were validated by expert reviewers before being shared with the participants.

Twenty-two job coaches participated in the study. Participants were recruited from several different organizations across the United States offering supported employment and employment services. Recruitment occurred through email blasts, including a research recruitment flyer, newsletters, social media posts, websites, word of mouth from individuals and organizations, and peer nomination. Pre- and posttraining measures were collected to determine the effectiveness of online PD on job coaches' knowledge, feelings of self-efficacy, and beliefs related to supporting with adults with ASD across employment settings. Once the participants completed the training and assessments, a downloadable work-related resource packet and a certificate of participation including 2 hours of continuing education units was made accessible.



## **Summary of Findings**

The data from this study support the need for job coaches working with adults with ASD who are minimally verbal or nonverbal in employment to have access to online PD focused on EBPs for ASD. Though the PD effectively increased job coaches' knowledge, on average, continuing education continues to be optional, therefore impacting participation and levels of engagement or investment in the process. Even with access to incentives (i.e., work-related resource packet and continuing education units), some participants had issues with engagement, and there was some attrition.

Given the provision of online training, job coaches demonstrated improvements in their knowledge based on the content included within the training. High scores on the knowledge instrument at pretest limited the potential for growth following the training. COVID-19 and the changes to work demands, responsibilities, and schedules resulting from the pandemic also impacted levels of participation and length of time to complete the study. The online training platform, allowing for self-paced learning across flexible times and locations, was an effective mechanism for providing PD to job coaches supporting adults with ASD in employment.

Significant improvements in self-efficacy were noted following the training as well. Increased knowledge of EBPs did not relate to changes in beliefs about clients' potential for successful employment. There was a positive association between increases in self-efficacy and beliefs about the potential for adults with ASD who are minimally or nonverbal to work and be successful in work when provided with evidence-based supports and teaching practices.

## **Interpretation of Findings**

The online PD training allowing for self-paced instruction, integrating several teaching techniques, was accessible across flexible locations. This format was an effective way to deliver training and increase knowledge and self-efficacy related to EBPs in job coaches working with adults who are minimally or nonverbal with ASD. These findings were well aligned with previous research on the efficacy of online PD for direct services providers working with adults with disabilities (Philipsen et al., 2019; Pittman & Lawdis, 2017; Van Oorsouw et al., 2009). Even with the additional COVID-19-related stressors impacting job coaches' work responsibilities and schedules, job coach participants communicated the desire to stay engaged, whether or not they were able to complete the study.

The data from this study supported the continued need for job coaches working with adults with ASD to access online PD on EBPs for ASD, though findings revealed job coach participants demonstrated higher than expected test scores at onset. Enhanced knowledge during the pretraining stage was unforeseen; even the nine content-area experts who critiqued the assessment instrument failed to identify the mismatch between participants' existing knowledge base and the level of difficulty on the pretest. Although the expert reviewers were well-versed in the field, they did not provide suggestions for wording changes or raise concerns about the level of difficulty in the final assessment questions. In looking back at the questions in the knowledge assessment, the level of complexity matched that of the originally expected level of knowledge for job coaches being recruited for the study. The complexity across questions followed Bloom's taxonomy (Boom & Lin, 2014) as originally planned.

There were several possible reasons for greater than expected knowledge prior to the training. A sample of 22 participants, although robust enough to run a meaningful statistical analysis, might not have been large enough to represent the greater population of job coaches. Whereas a bachelor's degree was required for participation in this study, some participants had or were in the process of pursuing graduate degrees in a related field. For the most part, those participants scored unexpectedly well on the pretest. Thus, the job coaches in this sample might have been a group of high performers already utilizing best practices or professionals who seek out PD for personal growth and gain. Participants also might have had a preferred interest in ASD, as it is uncommon for someone to sign up for training without a vested interest in the subject. Further, the inclusion of a glossary of terms, which was added initially to facilitate consistent interpretation of key constructs, might have inadvertently increased pretest scores by giving information to participants that they might not have had access to. For example, the definition of BST or EBPs might have unduly influenced the participants' responses to questions focused on these topics.

Various factors might have influenced job coaches' participation in the online learning experience. The majority of the participants were enrolled in the study under the guidance of their employing agencies. Unlike individuals who self-enrolled based on interest, these individuals were required by their employers to participate, which might have resulted in different participation patterns. Overall, these individuals were less likely to adhere to established time frames, required more frequent reminders, and had longer gaps between periods of engagement with the online learning materials. They also were more likely to be noncompleters. It is unclear as to whether these individuals' lack of

agency in enrolling in the study impacted their knowledge or self-efficacy following the online training.

Correlations between knowledge and self-efficacy trended positive but not with enough strength to indicate whether the trend was meaningful or an artifact. It is unclear whether a larger sample size or participants who self-selected for participation would have resulted in a statistically significant outcome. If the study had included a more extensive and more representative sample, the data analysis might have revealed a significant result despite areas of data loss.

Finally, a positive relationship between increases in self-efficacy and enhanced beliefs regarding the role of using EBPs while supporting adults with ASD in the workplace was an encouraging finding. Again, it is unknown whether factors related to participants' enrollment and sample size impacted this relationship.

### **Context of Findings**

These findings support existing literature in job coach training. Professional growth is often gained through PD to achieve and maintain professional certifications or licensure (Canaran & Mirici, 2019). Online PD effectively increases job coaches' knowledge. Effective PD should be accessible across time and use multiple teaching techniques, practice, feedback, praise, opportunities for reflection, and follow-up support when possible (Canaran & Mirici, 2019; Van Oorsouw et al., 2009). Online PD enhanced knowledge in job coaches, and participants remained engaged, even amid work-related changes resulting from COVID-19. Participants valued the self-paced nature and flexible scheduling of the online PD experience, supporting previous literature (Pittman & Lawdis, 2017; Powell & Bodur, 2019). Data analyzed reinforced the need to create online

PD for job coaches accessible across levels of expertise. Well-trained job coaches using EBPs support a continuous path to viable work for young adults significantly impacted by ASD (Wehman et al., 2020). An increase in knowledge has been previously noted to positively influence a provider's feelings of clinical confidence and competence (Pittman & Lawdis, 2017). Findings showed improvements in self-efficacy, even with an unforeseen loss in data, and a positive association between increases in self-efficacy and beliefs in clients' potential for successful employment. An increase in self-efficacy paired with increases in beliefs corresponds to the notion that the level and strength of self-efficacy impacts one's confidence, motivation, and attitude (Bandura, 1986, 1997).

In some areas the current study refutes existing literature. Findings of this investigation revealed that job coaches entered the training with a significantly higher level of knowledge than previously reported in studies of job coaches. Earlier findings indicated that job coaches were frequently ill prepared to work with individuals with ASD, evidencing a lack of knowledge and training in this area (Brock et al., 2016; Wehman et al., 2014; Wehman et al., 2020).

This appears to be the first study examining the role of online PD for job coaches supporting adults with ASD who are minimally verbal or nonverbal in employment settings. The bulk of research in AAC is pediatric. Additionally, the research currently available on adults and AAC has tended to focus on those individuals with acquired disorders (e.g., aphasia, Parkinson's disease, or amyotrophic lateral sclerosis or ALS). Therefore, this study has added to the body of work in a much-needed area of AAC for adults with developmental disabilities. These findings extend the limited evidence currently available on how best to provide job coaches training in a manner that fosters

effective job performance while integrating EBPs for ASD (Brock et al., 2016; Wehman et al., 2014; Wehman et al., 2020).

### **Implications of Findings**

These findings have implications on the theory, research, and practice related to the support of adults with ASD in employment settings. Bronfenbrenner's ecological systems theory guided the design of this study in many ways (Bronfenbrenner & Evans, 2000). Bronfenbrenner's theory provided a framework explaining how enhanced knowledge before training and independent versus agency enrollment could influence motivation to enroll and remain engaged in an online PD training. Unexpectedly high degrees of knowledge at pretest might have contributed to consistently high levels of engagement if those participants found the online training activities to be enjoyable and affirming of their level of knowledge about ASD and AAC. As suggested by Bronfenbrenner's theory, there appears to be a link between agency and motivation, in that participants who enrolled at the behest of their employer were less likely to complete the program. Those who independently made the decision to participate in the study may have been more motivated to complete the required activities.

In terms of research, implications of this study's findings drive the need to continue to learn about the various profiles of job coaches. Findings illustrated diversity in the educational backgrounds and training experiences across providers. Gaining a better understanding of job coaches' professional profiles will help guide the design of training across levels of expertise and inform the continuing education standards currently still in development. If the results of this study can be replicated, then it might not be appropriate to assume that job coaches have limited background in ASD and EBPs

in applied behavior analytic teaching.

Online training is a viable venue for job coaches working with individuals more significantly impacted by their disability, as the work of Wehman et al. (2020) suggested. The support of trained job coaches using evidence-based applied behavior analytic teaching techniques paves a seamless path to viable jobs aligned with individualized employment goals for young adults significantly impacted by ASD. The increased availability of tools for developing online training should create additional options for robust training of job coaches serving this clinical population.

In practical terms, studies such as this lend support for more nuanced training for job coaches working with this clinical population. Prior knowledge must be accounted for when developing training to accommodate job coaches so that those with a more robust background can be challenged to further advance their knowledge base. Furthermore, the lack of PD requirements and limited standards for job coaches must be addressed as the field of job coaching evolves. Powerful incentives need to be considered when continuing education is needed either to advance job coaches' current skill set or to maintain currency. Given the challenges faced by job coaches, administrators should consider prioritizing online PD experiences that provide participants with flexibility in determining when and where they will engage in training. Additional benefits of online training allow for the integration of multiple teaching techniques, which may contribute to sustained engagement and robust outcomes, both of which should inform the design of future training for job coaches. Though not significantly connected to increases in knowledge, feelings of self-efficacy do appear to play a role in job coaches' confidence

and belief systems; therefore, self-efficacy is worthy of consideration by organizations and agencies seeking to provide high-quality job coaching services.

### **Limitations of the Study**

As with all research, there are limitations to this study, which include threats to internal and external validity. A primary limitation relates to the design of the study. Because this investigation did not use a true experimental design, lacked a control group, and did not use random sampling in participant selection, causality between participation in training and positive outcomes could not be established. Historical factors and attrition also limited the internal stability of this study. Many participants experienced major life changes secondary to COVID-19, which led to modifications in their participation level or time to completion. This also contributed a smaller than desirable sample size. A greater number of participants might have yielded sufficient power in the two areas that had positive but nonsignificant results.

The study might have had a pretest–retest practice effect, making it difficult to understand whether improvements in knowledge were a result of the training or a result of familiarity in taking the same test twice (Edmonds & Kennedy, 2017). An unexpected data loss from the URP-IR for Job Coaches was further seen as a limitation.

Scores approaching ceiling before intervention, leaving less room for growth, occurred in a sizeable number of participants. The addition of a glossary of terms might have inadvertently affected initial levels of knowledge at pretest. The ceiling effect limited the ability to evaluate the impact of this training.

Several factors limit the ability to generalize the findings from this investigation. One threat to external validity relates to characteristics of the participants, who were job



coaches with educational profiles and experiences that exceed the typical requirements for job coaching. Because an online venue was used for this PD, it is unclear whether similar findings would occur for in-person training. The results of this training may not apply to training series or single trainings more than 2 hours in length.

### **Future Research Directions**

Because there is so little research directly with job coaches serving individuals with ASD, further study is needed in several areas. Given the multiple benefits of online PD, future research should seek to identify the active ingredients and best practices for this training methodology with job coaches. Online PD for job coaches should examine whether a series of online learning experiences is superior to a single training event. Hybrid learning experiences, with both online and face-to-face interaction, should be investigated. Studies could evaluate the cost-benefit ratio for this type of training.

Findings of this research call for further investigation into the relationship between participants' levels of engagement and learning outcomes, including the role of agency and self-selected enrollment. In doing so, studies should assess how high-value incentives paired with online PD for job coaches, along with factors described above, increase enrollment, sustained participation, and positive outcomes.

As this investigation was quasi-experimental, replicating this study using an experimental design is important to examine whether there is a causal relationship among the variables. Replication should include a larger, more representative sample with job coaches from diverse backgrounds, including those professionals with less direct experience in ASD. When working with a similar sample of job coaches, a more challenging knowledge assessment is advisable to avoid a ceiling effect in measuring

changes in learning. This information will be useful in the ongoing development of policies guiding the professional practice of job coaching.

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Appendix A  
Knowledge Assessment

## Knowledge Assessment

Enter your assigned participant number: \_\_\_\_\_

Please answer the following questions before participating in the Online Training to Improve Job Coaches' Support of Minimally Verbal and Nonverbal Adults With Autism Spectrum Disorder (ASD).

A review of terms is provided to ensure all questions can be answered with the greatest level of understanding possible. For the purpose of this activity:

- ***Minimally verbal or nonverbal*** refers to an individual presenting with a range of expressive abilities from no use of oral language to use of few oral words or phrases
- ***Augmentative & Alternative Communication (AAC)*** refers to an area of clinical practice focused on supporting individuals with complex communication disorders to efficiently and effectively engage in a variety of interactions and activities of interest.
- ***Evidence-based practices (EBPs)*** refer to a professional having an understanding of practices with evidence of positive impacts supporting one's ability to make informed decisions and provide high-quality services when assisting adults with ASD in employment settings
- ***Behavior skills training (BST)*** refers to the evidence-based approach used by job coaches to support adults with ASD learning job tasks and communication skills across employment settings.

### Demographic Items

1. What is your gender?
  - a. Female
  - b. Male
  - c. Other: \_\_\_\_\_
  - d. Rather not specify
  
2. What is your undergraduate degree (major) in?
  - a. Psychology
  - b. Special Education
  - c. Social Work or Mental Health Counseling
  - d. Vocational Rehabilitation
  - e. Other Related Field: \_\_\_\_\_

3. Please indicate your highest level of degree.
  - a. Bachelor's degree
  - b. Masters' degree
  - c. Doctorate
4. How many years' experience do you have working with adults with autism spectrum disorder in employment settings?
  - a. 1-3
  - b. 3-5
  - c. 5-7
  - d. 7-9
  - e. 10+
5. Do you have experience working with adults with autism spectrum disorder who are minimally verbal or nonverbal?
  - a. Yes
  - b. No
6. If yes, were any of the adults with ASD users of augmentative and alternative communication (AAC)?
  - a. Yes
  - b. No
7. Have you taken any courses on augmentative and alternative communication (AAC)?
  - a. Yes, a workshop
  - b. Yes, a college course at the undergraduate level
  - c. Yes, a colleague course at the graduate level
  - d. No
  - e. Not sure
8. Have you taken any courses specific to behavior skills training (BST)?
  - a. Yes, a workshop
  - b. Yes, a college course at the undergraduate level
  - c. Yes, a colleague course at the graduate level
  - d. No
  - e. Not sure

## Knowledge Items

Please select the best response for each item.

1. Training of job coaches working with adults with ASD who are minimally verbal or nonverbal in employment should include, but may not be limited to:
  - a. An overview of ASD and information of evidence-based practices for individuals with ASD not including information on augmentative and alternative communication (AAC)
  - b. Evidence-based practices for individuals with ASD and adult learning principles
  - c. An overview of ASD and adult learning principles
  - d. Information on sensory problems in ASD
  - e. An overview of ASD, information of evidence-based practices for individuals with ASD to include a review of AAC, and details related to adult learning principles
  
2. When working with an adult with ASD who is minimally verbal or nonverbal on the job, a job coach should support the learning of:
  - a. Just the adult with ASD, the employer, and the staff
  - b. Just the employer
  - c. Just the staff
  - d. The employer and the staff
  - e. The adult with ASD and the parent
  
3. To support success in employment for adults with ASD who are minimally verbal or nonverbal, a job coach should make sure to understand the work responsibilities and expectations in advance of the individual's first day. Strategies for preparing in advance may include, but not be limited to:
  - a. Previsiting the work site, preteaching skills, pretraining staff on ASD and the individual's communication needs, and making necessary accommodations to the environment
  - b. Previsiting the work site, preteaching skills, and making necessary accommodations to the environment
  - c. Previsiting the work site, preteaching skills, and pretraining staff on ASD and the individual's communication needs,
  - d. Previsiting the work site and preteaching skills
  - e. Conducting a phone interview with the site manager only

4. Areas in which job coaches need to consider using accommodations to facilitate success in employment for adults with ASD who are minimally verbal or nonverbal include:
  - a. Social interactions, attitudes, and sensory or physical factors
  - b. Social interactions, attitudes, and sensory factors
  - c. Social interactions, workplace attitudes, and sensory or physical factors
  - d. Physical factors, workplace attitudes, and behaviors
  - e. Social interactions and sensory factors
5. Behavior skills training (BST) involves:
  - a. Instruction, modeling, and prompting to teach new behaviors or skills
  - b. Physically assistance to teach new behaviors or skills
  - c. Instruction, modeling, behavioral rehearsal, or feedback to teach new behaviors or skills
  - d. Verbal prompting only to teach new behaviors or skills
  - e. Instruction and modeling to teach new behaviors or skills
6. The primary steps in behavior skills training (BST) include:
  - a. Practice the target skill and provide feedback until mastery
  - b. Describe, practice the target skill, and provide feedback until mastery
  - c. Provide a succinct written description of the skill, demonstrate the target skill, and practice the target skill
  - d. Describe the target skill, provide a succinct written description of the skill, demonstrate the target skill, practice the target skill, provide feedback during practice, and repeat practice and feedback until mastery
  - e. Model and practice the target skill until mastery

7. Behavior skills training (BST) can be used to teach a variety of skills (e.g., communication, social skills, daily living, employment, and coping skills) supporting success in the workplace for adults with ASD who are minimally verbal or nonverbal. Individuals responding best to learning through a BST approach:
  - a. Can actively engage in role play scenarios, follow instructions, and imitate models, without the need for intrusive prompting and fading or chaining procedures
  - b. Can follow verbal instructions and imitate both video and in-person models without support
  - c. Can only learn with verbal prompting
  - d. Can learn independently without the support of a systematic teaching procedure
  - e. Cannot actively engage in role-play scenarios, follow instructions, and imitate models, without intrusive prompting and fading or chaining procedures
8. Instructions provided within BST should be presented when:
  - a. The learner is paying attention, paired with a model when necessary, provided at a level of language understood by the job coach
  - b. The learner is paying attention, paired with a model when necessary, paired with multiple opportunities to rehearse or practice the behavior, and provided at a level understood by the learner using a written or picture-based task analysis
  - c. The learner is paying attention, paired with a model when necessary, paired with multiple opportunities to rehearse or practice the behavior, and provided with picture cues only
  - d. The learner is paying attention and the instructions are provided at a third- to eighth-grade reading level
  - e. The learner is paying attention, paired with a model when necessary, paired with multiple opportunities to rehearse or practice the behavior, and provided at a fifth- to eighth-grade reading level
9. Demonstration of the target skill in BST can occur through:
  - a. In-person modeling only
  - b. In-person and role play only
  - c. Video modeling only
  - d. Situational assessments only
  - e. In-person modeling, video modeling, situational assessments, or role play.

10. Practice or rehearsal is a critical feature to achieve success in behavior skills training (BST). The opportunity for the learner to practice the behavior after receiving instructions or after watching a model helps to:
  - a. Allow for reinforcement to be provided for correct behaviors and provide an opportunity to assess and correct any errors
  - b. Demonstrate if the learner actually learned the correct behavior and provide an opportunity to assess and correct any errors
  - c. Demonstrate if the learner actually learned the correct behavior
  - d. Demonstrate if the learner actually learned the correct behavior, allow for reinforcement to be provided for correct behaviors, and provide an opportunity to assess and correct any errors
  - e. Determine if the skill is appropriate to teach the learner.
11. In behavior skills training (BST), practice and feedback should continue until:
  - a. Each trainee performs the target skill at home and in the community
  - b. Each trainee performs the target skill proficiently during the typical work routine
  - c. Each trainee performs the target skill with physical assistance at 80% accuracy
  - d. Each trainee performs the target skill with gestural assistance at 80% accuracy
  - e. Each trainee performs the target skill with visual cue at 80% accuracy
12. When using a behavior skills training (BST) approach to teach skills, feedback should:
  - a. Be given immediately after behavior, include descriptive praise connected to some aspect of the behavior, and occur before providing corrective feedback.
  - b. Be given immediately after behavior and include descriptive praise connected to some aspect of the behavior
  - c. Always be in the form of descriptive praise and never include corrective feedback
  - d. Include descriptive praise connected to some aspect of the behavior and occur before providing corrective feedback.
  - e. Be given later in the day using more general than specific terms



13. Which of the following are considered to be categories of evidence-based accommodations supporting adults with ASD who are minimally verbal or nonverbal in employment?
  - a. Job development, placement, stabilization, and transition
  - b. Employment services, supported employment, and peer mentorship
  - c. Environmental, sensory, behavioral, communication, social skills, and task completion supports
  - d. Transition services, financial literacy, and daily living
  - e. Employer and sensitivity trainings
14. Evidence-based supports facilitating success for an individual with ASD who is minimally verbal or nonverbal in the workplace may include:
  - a. Use of visual and written scripts of what to say while working and visual or written work schedules
  - b. Use of visual or written work schedules and use of timers
  - c. Use of timers and video models
  - d. Use of visual and written scripts/supports of what to say while working, visual or written work schedules, video models or video prompts of individual work tasks, and use of timers to support time on task and transitions from preferred to non-preferred job duties
  - e. Use of written notes about work tasks
15. Adults with ASD who are minimally verbal or nonverbal often have difficulty learning and using expected social skills. Per the research, social skills employers care most about and those that require direct instruction support for success on the job include:
  - a. Greetings, requesting assistance, and responding “appropriately” to feedback,
  - b. Greetings, requesting assistance, responding “appropriately” to feedback, problem-solving, personal boundaries, topics of conversations, and hygiene or grooming
  - c. Greetings, requesting assistance, responding “appropriately” to feedback, problem-solving, and hygiene or grooming
  - d. Greetings, problem-solving, personal boundaries, topics of conversations, and hygiene or grooming
  - e. Avoiding use of profanity in the workplace

16. Adults with ASD who are minimally verbal or nonverbal in employment may need support in using expected social skills on the job. Evidence-based strategies supporting the use of social skills in employment may include, but not be limited to:
- a. Review and model or role-play social behaviors expected in the environment and provide concrete examples of expected behaviors and consequences
  - b. Review and model or role-play social behaviors expected in the environment, provide concrete examples of expected behaviors and consequences, and recognize and reward expected behaviors
  - c. Provide concrete examples of expected behaviors and consequences and recognize and reward expected behaviors
  - d. Use video models to demonstrate appropriate social skills
  - e. Role-play social behaviors and recognize, and reward expected behaviors
17. What is the primary focus of augmentative and alternative communication (AAC) for individuals with ASD who are minimally verbal or nonverbal in employment settings?
- a. To effectively and efficiently communicate wants and needs
  - b. To effectively and efficiently communicates feelings related to work
  - c. To effectively and efficiently assist with behavior and coping skills
  - d. To effectively and efficiently meet all communication needs across settings
  - e. To effectively and efficiently respond to others' communication
18. The provision of augmentative and alternative communication (AAC) is recommended for individuals with ASD who:
- a. Are nonverbal and cannot rely on verbal language alone to meet all of their daily communication needs.
  - b. Can speak and understand verbal language.
  - c. Are minimally verbal or nonverbal and cannot rely on verbal language alone to meet all of their daily communication needs.
  - d. Can speak, but have difficulty speaking and understand language
  - e. Are independently working in paid employment

19. Examples of augmentative and alternative communication (AAC) for adults with ASD who are minimally verbal or nonverbal in employment include:
  - a. High-tech speech-generating devices and applications embedded within other devices, smart phones, or tablets
  - b. A combination of low-tech and high-tech strategies and systems with the use of any gestures, signs, words, or facial expressions
  - c. A combination of low- and high-tech strategies and systems paired without the use of gestures, signs, words, and facial expressions
  - d. Low-tech systems (e.g., exchanging objects or pictures)
  - e. Gestures, sign-language, words, or facial expressions
20. The primary agencies considered sound resources for learning more about supporting adults with ASD in the workforce include:
  - a. The Job Accommodation Network (JAN), the Organization for Autism Researcher (OAR), the Employer Assistance and Resource Network on Disability Inclusion (EARN), and Autism Speaks
  - b. The Organization for Autism Researcher (OAR), the Employer Assistance and Resource Network on Disability Inclusion (EARN), and Autism Speaks
  - c. The Employer Assistance and Resource Network on Disability Inclusion (EARN) and Autism Speaks
  - d. National Alliance on Mental Health and the American Speech-Language-Hearing Association
  - e. The Organization for Autism Researcher (OAR) and the Employer Assistance and Resource Network on Disability Inclusion (EARN)

## Appendix B

### Expert Reviewer Feedback Form

## Expert Reviewer Feedback Form

Name: \_\_\_\_\_ Credentials: \_\_\_\_\_

Title: \_\_\_\_\_ Place of Employment: \_\_\_\_\_

Discipline: \_\_\_\_\_ Years of Professional Experience: \_\_\_\_\_

Thank you for agreeing to be an Expert Reviewer for the Online Training to Improve Job Coaches' Support of Minimally Verbal and Nonverbal Adults With Autism Spectrum Disorder. After reviewing the training content, please indicate the level of agreement for each statement. Please also include comments and suggestions for each area. When providing feedback, please be as candid and explicit as possible. The more critical and constructive the feedback, the more helpful it will be to the study.

1. The overall training content is presented in an organized, clear, and sequential format.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

2. The photos and graphics are adequate in size, and color and enhanced the presentation.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

3. The flow of the training and content is easy to follow.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

4. The inclusion of case studies and videos is relevant to the content and enhanced the overall training.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

5. Terms included were accurate, clearly defined, and understandable throughout the training.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

6. The amount and level of content related to job coaching and adults with ASD who are minimally or nonverbal in the workforce are adequate for this training.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

7. The content related to job coaching and adults with ASD who are minimally or nonverbal in the workforce is presented in an organized, clear, and sequential format.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

8. The language and tone related to the content on job coaching and adults with ASD who are minimally or nonverbal are a good match relative to the target audience.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

9. The amount and level of content related to the use of BST with adults with ASD who are minimally or nonverbal in the workforce are adequate for this training.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

10. The content related to the use of BST with adults with ASD who are minimally or nonverbal in the workforce is presented in an organized, clear, and sequential format.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

11. The language and tone related to the content on the use of behavior skills training (BST) with adults with ASD who are minimally or nonverbal is a good match relative to the target audience.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

12. The amount and level of content related to evidence-based practices, to include accommodations, with adults with ASD who are minimally or nonverbal in the workforce is adequate for this training.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

13. The content related to evidence-based practices, to include accommodations, with adults with ASD who are minimally or nonverbal in the workforce is presented in an organized, clear, and sequential format.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

14. The language and tone related to the content on evidence-based practices, to include accommodations, with adults with ASD who are minimally or nonverbal in the workforce is a good match relative to the target audience.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

15. The amount and level of content related to AAC for adults with ASD who are minimally or nonverbal in the workforce are adequate for this training.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

16. The content related to AAC for adults with ASD who are minimally or nonverbal in the workforce is presented in an organized, clear, and sequential format.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

17. The language and tone related to the content on AAC for adults with ASD who are minimally or nonverbal in the workforce are a good match relative to the target audience.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

18. The amount and level of content related to resources for job coaches working with adults with ASD who are minimally or nonverbal in the workforce are adequate for this training.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:



19. The content related to resources for job coaches working with adults with ASD who are minimally or nonverbal in the workforce is presented in an organized, clear, and sequential format.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

20. The language and tone related to the content on resources for job coaches working with adults with ASD who are minimally or nonverbal in the workforce is a good match relative to the target audience.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

21. The overall training content and examples are translatable into practice.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

22. The length of the training is adequate for the amount of content included.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

23. The online format of the training is accessible, is user friendly, and supports active engagement.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

24. The structure and format of the training meets a variety of learning styles.

☐ Yes      ☐ Yes, but needs work (see comments)      ☐ No (see comments)

Comments:

25. Please list any slide(s) including content, photos, or graphics that would benefit from modifications.
26. Please list if any changes to the order of the content should be modified.
27. Please list any video or case example that may benefit from modifications

## Appendix C

### Permission to Use the URP-IR

RE: Usage Rating Profile-Intervention Revised- Request for modified use

From: "Chafouleas, Sandra" <sandra.chafouleas@uconn.edu>  
 Subject: RE: Usage Rating Profile-Intervention Revised- Request for modified use  
 Date: August 10, 2020 at 8:31:40 AM EDT  
 To: Erin Lozott <elozott@globalautismconsulting.com>

Hi Erin -

Thanks for connecting! Your work sounds really interesting. Of course you have permission to use the URP in modified form... we ask only that you credit the original source in your work, and understand that permission is granted for non-commercial use only.

Be well.  
 Sandy

Sandra M. Chafouleas  
 Board of Trustees Distinguished Professor, Dept. of Educational Psychology, Neag School of Education  
 Co-Director, Collaboratory on School and Child Health  
 University of Connecticut  
[education.uconn.edu/sandra-chafouleas/she/her/hers](http://education.uconn.edu/sandra-chafouleas/she/her/hers)

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-----Original Message-----  
 From: Erin Lozott <elozott@globalautismconsulting.com>  
 Sent: Sunday, August 9, 2020 3:40 PM  
 To: Chafouleas, Sandra <sandra.chafouleas@uconn.edu>  
 Subject: Usage Rating Profile-Intervention Revised- Request for modified use

\*Message sent from a system outside of UConn.\*

Good Morning Dr. Chafouleas,

I hope all is well. My name is Erin Brooker Lozott. I am a doctoral student at Nova Southeastern University. I am writing to ask for permission to make modifications and then use the Usage Rating Profile-Intervention Revised in my dissertation study. I am working to improve job coaches' support of minimally and nonverbal adults with autism spectrum disorder through online training. The training I am creating and studying focuses on teaching job coaches about evidence-based practices for individuals with ASD, using a Behavior Skills Training approach to support complex communication needs. In researching self-efficacy measurements, I learned about the Usage Rating Profile-Intervention Revised. I felt, although it wasn't developed explicitly for job coaches or those working with adults, with minimal modifications, it would capture the information I am looking to gain. I would be grateful to have your permission to modify and then use this measure. I will look forward to hearing back from you. Thank you in advance for your time and consideration of this matter.

Most Sincerely,

Erin

## Appendix D

### URPI-IR for Job Coaches

### Usage Rating Profile–Intervention Revised (URP-IR) for Job Coaches

Enter your assigned participant number: \_\_\_\_\_

Please rate the following items on a scale of 1 (*Strongly Disagree*) to 6 (*Strongly Agree*) before participating in the Online Training to Improve Job Coaches' Support of Minimally Verbal and Nonverbal Adults With Autism Spectrum Disorder (ASD).

A review of terms is provided to ensure all items can be rated with the greatest level of accuracy possible. For the purpose of this activity:

- The term ***“Intervention”*** refers to ***Behavior skills training (BST)***, an evidence-based approach used by job coaches to support adults with ASD learning job tasks and communication skills across employment settings.
- The term ***“Materials”*** refers to any items (e.g., task analysis, script, video model, visual supports) a job coach would need when using a BST approach to teach job tasks or communication skills to an adult with ASD who is minimally verbal or nonverbal in the workforce.

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1. This intervention is an effective choice for addressing a variety of problems.	1	2	3	4	5	6
2. I would need additional resources to carry out this intervention	1	2	3	4	5	6
3. I would be able to allocate my time to implement this intervention.	1	2	3	4	5	6
4. I understand how to use this intervention.	1	2	3	4	5	6
5. A positive employer–job coach–employee relationship is needed to implement this intervention.	1	2	3	4	5	6
6. I am knowledgeable about the intervention procedures.	1	2	3	4	5	6

	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
7. The intervention is a fair way to support communication needs of an adult with ASD.	1	2	3	4	5	6
8. The total time required to implement the intervention procedures would be manageable.	1	2	3	4	5	6
9. I would not be interested in implementing this intervention.	1	2	3	4	5	6
10. My employer or agency would be supportive of my use of this intervention.	1	2	3	4	5	6
11. I would have positive attitudes about implementing this intervention.	1	2	3	4	5	6
12. This intervention is a good way to support an adult with ASD in an employment setting.	1	2	3	4	5	6
13. Preparation of materials (e.g., task analysis, script, video model, visual supports) needed for this intervention would be minimal.	1	2	3	4	5	6
14. Use of this intervention would be consistent with the mission of my agency.	1	2	3	4	5	6
15. Employer collaboration is required in order to use this intervention.	1	2	3	4	5	6
16. Implementation of this intervention is well matched to what is expected in my job.	1	2	3	4	5	6

	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
17. Material resources (e.g., task analysis, script, video model, visual supports) needed for this intervention are reasonable.	1	2	3	4	5	6
18. I would implement this intervention with a good deal of enthusiasm.	1	2	3	4	5	6
19. This intervention is too complex to carry out accurately.	1	2	3	4	5	6
20. These intervention procedures are consistent with the way things are done in my system.	1	2	3	4	5	6
21. This intervention would not be disruptive to other staff members or employees.	1	2	3	4	5	6
22. I would be committed to carrying out this intervention.	1	2	3	4	5	6
23. The intervention procedures easily fit in with my current practices.	1	2	3	4	5	6
24. I would need consultative support to implement this intervention.	1	2	3	4	5	6
25. I understand the procedures of this intervention.	1	2	3	4	5	6
26. My work environment is conducive to implementation of an intervention like this one.	1	2	3	4	5	6



	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
27. The amount of time required for record keeping would be reasonable.	1	2	3	4	5	6
28. Regular employer–job coach–employee communication is needed to implement intervention procedures.	1	2	3	4	5	6
29. I would require additional professional development in order to implement this intervention.	1	2	3	4	5	6