

Workplace Success Strategies for Employees With Autism Spectrum Disorder: A New Frontier for Human Resource Development

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Abstract

The increased prevalence of young adults with Autism Spectrum Disorder (ASD) translates into a dire need to find ways to facilitate successful employment opportunities. Employment options are limited because of impaired communication and social skills that are vital for the workplace. There are a growing number of studies published on the need for employment, and primarily social psychologists, medical, and rehabilitation professionals have conducted this research; this necessitates multidisciplinary research that involves workforce development experts. Our study identified ways that human resource development (HRD) professionals can foster skill development and promote a work environment that supports the success of employees with ASD. Through a narrative literature review, key themes were identified as critical employment strategies that fall within the scope of HRD. As agents of change, HRD professionals can play a role in the multifaceted and multidisciplinary approach needed to facilitate improved work outcomes of employees with ASD.

Keywords

autism spectrum disorder, ASD, skill development, workplace readiness, human resource development

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One of the earliest definitions of human resource development (HRD) conceptualized by Harbison and Myers (1964) is “increasing the knowledge, the skills, and the capacities of all the people in a society” (p. 2). They suggested that human resources (HR) can be developed in many ways, including formal education, on-the-job formal and informal training, and self-development with the goal of HRD to build knowledge and skills needed for economic, social, cultural, and political development and to provide avenues of participation for the creation of a better society for all (Harbison & Myers, 1964). Parallel to the underlying definitional philosophy of Harbison and Myers (1964), McLean and McLean (2001) later defined HRD as

... any process or activity that, either initially or over the long term has the potential to develop . . . work-based knowledge, expertise, productivity and satisfaction, whether for personal or group/team gain, or for the benefit of an organization, community, nation, or, ultimately, the whole of humanity. (p. 10)

In addition to the widely accepted components of HRD (training and development, organization development, career development), McLean and McLean (2001) highlighted other expanding roles and activities of the field to include continuous quality/process improvement, employee assistance, diversity management, community building, and employee retention, among others.

Early human capital–influenced descriptions stated that a core objective of HRD is to provide employment and broader opportunities for individuals who are “unutilized and underutilized” (Harbison & Myers, 1964). The opportunity to work and be productive in a structured environment helps individuals to find purpose and contributes positively to physical and psychological well-being and quality of life (Salkever, 2000). Yet, there are minority and underrepresented groups within the United States that encounter challenges to obtain and retain jobs despite necessary qualifications and skills set. For example, individuals with disabilities represent 26% (61 million) of the U.S. population (Centers for Disease Control and Prevention [CDC], 2019c), and only 19.1% who are of working age are employed (Bureau of Labor Statistics, 2018). Although limited and fragmented in scope, HRD and adult education researchers have sought to unearth root causes of employers’ mental barriers, the stigma, and associated bias attached to people with disabilities with the aim to promote more equal opportunities, and integrate issues related to disabilities into HR activities and education to better accommodate the work-related needs of this population (Hidegh & Csillag, 2013). Ross-Gordon (2002) implored adult educators, trainers, and administrators to be aware of, and responsive to the needs of, adult learners with disabilities. In addition, Fornes et al. (2008) investigated job retention strategies by developing a model to provide structure for rehabilitation and HR practitioners to understand job retention interventions appropriate for individuals with intellectual disabilities and intellectual developmental disorders. Researchers have argued that HR professionals play a vital role in changing the status quo “necessary to deconstruct the beliefs and presumptions that impede the employment of people with disabilities” (Hidegh & Csillag, 2013, p. 23).

While research on disability is dispersed throughout the HRD literature, generally, the subject is largely neglected in HRD conversations when addressing diverse or minority groups (Bierema, 2010; Rocco, 1998, 2002, 2005; Procknow & Rocco, 2016). The field of HRD claims “diversity as a vital responsibility, and diversity management a key competency” (Bierema, 2010, p. 565). Yet, race, age, and gender are the central areas of HRD research on diversity, and the mention of disability has the tendency to focus more on a physical disability rather than a mental, neurodevelopmental, and/or cognitive disability (Procknow & Rocco, 2016). Furthermore, with the limited HRD research that investigates ways that learning and training can enhance the potential of individuals with disabilities, there appears to be a disconnect between principles of humanistic theories underpinning HRD (Bierema, 2010) and the actual mission of HRD—the development of human potential to improve individual, organizational, community, or national gain (McLean & McLean, 2001).

One minority group that has been ignored in the HRD literature includes individuals with autism spectrum disorder (ASD). ASD represents a distinct category of developmental disabilities, characterized by difficulties in social interaction and communication, and restricted or repetitive behaviors (American Psychiatric Association, 2014). As a lifelong neurodevelopmental disorder, ASD can mildly, moderately, or severely impact an individual’s behavior, communication, and social interaction (CDC, 2019a). Individuals with ASD have a range of intellectual ability that includes below average skills to giftedness. For those with average and above intelligence, cognitive ability is not a barrier, so meaningful life outcomes (employment, social interaction, independence, friendships, postsecondary education, and community participation) are expected (CDC, 2019a). Unfortunately, this is not the case, because IQ is not the only factor that determines a successful outcome (Duncan & Bishop, 2015; Eaves & Ho, 2008; Farley et al., 2009). Employment options for many individuals with ASD are limited because of impaired communication and social skills critical for effective functioning in the workplace. However, studies have indicated that appropriate interventions and training can lead to positive behavior change and improved work performance (Smith & Coleman, 1986; Wehman et al., 2017). When compared with other disability groups, individuals with ASD are at risk for unemployment and underemployment and have the lowest employment and pay rates (see Bush & Tassé, 2017; Dreaver et al., 2019; Frank et al., 2018).

There are numerous and significant barriers to employment and workforce participation (Nicholas et al., 2018). Adults with ASD tend to be unemployed and underemployed because of the challenges with the application and interview processes, lack of a thorough understanding of the social demands of the work environment, problems to secure a position that best matches their skills and qualifications, and difficulty adapting to an unpredictable workplace, including environmental factors (Dreaver et al., 2019; Scott et al., 2019). For these reasons, the transition into employment and retaining employment appear to be much more difficult for individuals with ASD. Almost 50% of individuals with a diagnosis of ASD have average or above-average intelligence, yet regardless of their educational level and qualifications, only a small percentage are employed (Hensel, 2017). Some adults with ASD

have the desire and ability to work after secondary education or following training programs (Hendricks, 2010).

As the numbers of young adults with ASD continue to increase, there is a need to expand and improve employment opportunities (Hensel, 2017; Shattuck et al., 2012). However, there is a lack of research on employment skill development and workplace strategies needed to promote the success of individuals with ASD (Bennett & Dukes, 2013). Although the primary goal of HRD is to improve the knowledge, skills, and abilities of individuals for their well-being and organizational efficiency (McLean & McLean, 2001), this issue has been overlooked in HRD research and practice.

Research has shown that individuals with ASD who obtain employment experience decreased anxiety, improved self-esteem and emotional state, financial gain, independence, and enhanced well-being (Hurlbutt & Chalmers, 2004). This study will help to dispel some of the stereotypes employers have of individuals with disabilities that are not substantiated by research (Lengnick-Hall et al., 2008). HRD professionals will gain increased knowledge of ways to facilitate employment success of adults with ASD and further promote workplace diversity through ASD awareness. As a starting point in the HRD academic literature, the purpose of this study is to identify ways that HRD professionals can foster skill development to support the success of employees with ASD. The research question guiding the literature review study is, what role can HRD professionals play to support employment success of individuals with ASD in the workplace?

The Problem

By some estimates, 1% of the world's population is diagnosed with ASD (CDC, 2014). More than 3.5-million people in the United States live with the disorder. The percentage of individuals with ASD increased by 6% to 15% each year from 2002 to 2010 (CDC, 2014). Current estimates point to a widespread presence of ASD in the United States as 1 in 59 children (CDC, 2019b), a dramatic increase from 1 in 68 reported in 2014 (CDC, 2014). Pressure to expand employment opportunities for people with ASD will increase because experts project that there will be a 230% increase in the number of young adults with autism over the next decade (Hensel, 2017).

The advantages of hiring individuals on the autism spectrum are becoming more obvious to a handful of employers. Individuals with ASD offer productivity advantages to the labor market because of their ability to make positive contributions to the technology sector (Hayward et al., 2019). Technology-related work is viewed as ideal for some individuals with autism because of their ability to maintain focus for extended periods, recognize patterns, and accurately perform repetitive and detail-oriented tasks (Hayward et al., 2019; Skibell, 2017). With the increasing use of technology in organizations, the skills of individuals with ASD can be utilized (Cullum & Ennis-Cole, 2014; Skibell, 2017) to benefit both the organization and the employee. In addition to technology-related skills, some individuals with autism are endowed with other qualities such as high levels of math and/or memory skills, cognitive, spatial, musical, or artistic ability; furthermore, they possess characteristics

such as honesty, reliability, trustworthiness, and persistence (Caron et al., 2004; Hillier et al., 2007; Mawhood & Howlin, 1999)—competencies and traits needed in the workplace. Individuals with ASD outperform their counterparts on tasks that require pattern matching, manipulating multidimensional shapes, and locating structures (Perreault et al., 2011). In addition, persons with ASD tend to perform better than their neurotypical peers on Raven's Progressive Standard Matrices—an IQ test that requires the use of spatial skills to complete visual patterns (Nader et al., 2016; Stevenson & Gernsbacher, 2013).

Technology-intensive companies including Microsoft, SAP Software and Solutions, and JPMorgan Chase have launched programs to employ this potentially resourceful and available pool of individuals (Skibell, 2017). Some adults with ASD have been employed in industry sectors including health care, retail, recreation, hospitality/food service, warehouse, education, and government (Wehman et al., 2016). However, they tend to hold short-term employment because of workplace challenges with supervisors and/or colleagues, or the demands of the job (Mawhood & Howlin, 1999). Employers are timid to employ individuals with ASD because of a lack of awareness and understanding of the disorder and are more likely to focus on the repetitive or negative behaviors than the individual's potential and capabilities (Nesbitt, 2000).

Minimal research exists on employment readiness, access to employment, career development, and retention of individuals with ASD in the workforce (Brooke et al., 2018; Nicholas et al., 2018; Wehman et al., 2017). Understanding the experience of individuals with ASD on the job is important to be able to develop strategic interventions to better accommodate their needs. There is a need for more research focused on strategies to improve employment outcomes (Wei et al., 2018). Although a growing number of studies have been published on the need for employment opportunities, the research has been conducted primarily by social psychologists, medical and rehabilitation professionals (Lengnick-Hall et al., 2008) with very limited focus on work settings and workforce development experts.

Employment opportunities are estimated to increase by 11.5 million over the 2016–2026 decade, an increase from 156.1 million to 167.6 million. This 0.7% annual growth is faster than the 0.5% growth from the previous decade. A decline in baby boomers in the labor force (Bureau of Labor Statistics, 2016) accompanied by a decline in youth because of slow population growth (U.S. Census Bureau, 2013) will result in a shortage of workers. Exploring the “largely untapped” and growing labor pool of individuals with ASD can be beneficial to both employers and individuals on the autism spectrum (Lengnick-Hall et al., 2008). The increased prevalence of ASD translates into a need to find strategies to facilitate successful transition to the workplace and adequate employment support.

Method

The narrative literature review methodology used for this study adhered to Gregory and Denniss' (2018) four step process: (a) define topic and audience, (b) search and re-search the literature, (c) be critical, and (d) find a logical structure. A narrative

review is a (non-systematic) comprehensive summation and synthesis of previous publications and is usually driven by a broader research question in comparison to systematic reviews (Gregory & Dennis, 2018). Narrative overviews help to present a wider perspective on a topic and bring certain matters and concerns into view (Green et al., 2006) while also aiming to provide “objective conclusions based upon the literature reviewed” (Green et al., 2006, p. 103).

Step 1: Define Topic and Audience

A narrative review is appropriate for this study because to date, there is no coverage in the HRD literature on the value that HRD researchers and practitioners can contribute to facilitate more favorable workplace experiences and outcomes for individuals with ASD. The aim is to create a broader perspective on the multifaceted process needed to transition and retain adults with ASD in the workplace and to bring to light the potential role of HRD professionals to help ensure successful employment.

Step 2: Search and Re-Search the Literature

To answer the research question, a number of databases were used for the literature search to provide reasonable depth and breadth of the topic (Green et al., 2006). Databases included EBSCOhost, PsycARTICLES, PsycINFO, Psychology and Behavioral Sciences Collection, Health Reference Center Academic, Business Source Complete, Academic Search Complete, and Google Scholar. Keywords used in the search were “autism,” “autism spectrum disorder,” “ASD,” “employment,” “underemployment,” “unemployed,” “employment opportunities,” “job,” “work,” “career development,” and “career.” Keywords were combined using Boolean operators to expand the search strategy. Articles were found primarily in rehabilitation, medical, and health-related journals including *Journal of Vocational Rehabilitation*, *Journal of Autism and Developmental Disorders*, *Medical Teacher*, *Journal of the American Academy of Child and Adolescent Psychiatry*, and *Research in Developmental Disabilities*.

Because a significant number of individuals with autism are currently becoming adults (Strickland et al., 2013), no time span was set for the study. The majority of articles found were published within the last 10 years. Although selection criteria for narrative reviews are not as rigorous as that of systematic reviews, specific parameters were necessary to make the project more practical (Green et al., 2006). Articles included in the search had to be conducted within the context of the United States, published in English, with the primary focus on workplace readiness and skill development of individuals with ASD. From the initial search, operative words needed to be identified in the title of the article, abstract, or keyword section. This initial search resulted in a total of 178 articles identified through the databases. After sifting through the titles, a number of duplicates were identified from the search. With careful review of the abstracts, fewer articles were reviewed for the study after eliminating nonrelevant publications that were not directly related to the context of the workplace—may have focused too

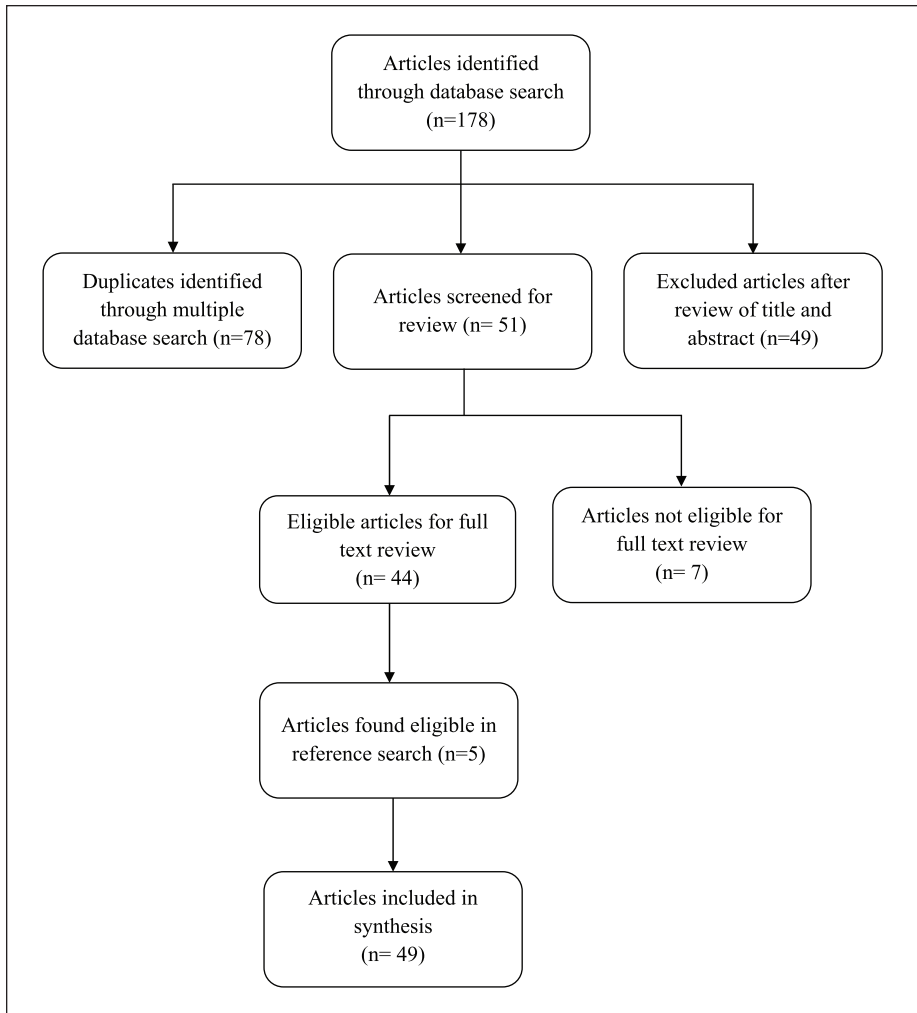


Figure 1. Article identification process.

heavily on comparison groups, or employment challenges of parents of individuals with ASD. A total of 51 articles were screened for thorough review. After reviewing the full article, there was a further elimination of some articles mainly because the studies were conducted outside of the United States or may have been related to legal work issues. Using the snowball technique, other related articles from in-text citations and reference lists were included in the literature review to gain a richer collection of data (Callahan, 2010) and a deeper perspective of the topic. From the search process, a total of 49 articles were included in the study. Figure 1 outlines the article identification process.

Step 3: Be Critical

Narrative reviews are used to describe or explore emerging topics by highlighting the influence of interventions and factors that affect the needs of specific population groups (Popay et al., 2006). Narrative reviews tell a convincing story by portraying evidence of the importance of a phenomenon (Popay et al., 2006). Considering that the topic under investigation is preliminary, this study assumed the first stage of exploration using a descriptive perspective. A critical discussion is provided by analyzing the data, identifying knowledge gaps, and offering new insights (Gregory & Denniss, 2018) on how HRD can facilitate employment success and improved well-being of individuals with ASD.

Step 4: Find a Logical Structure

Narrative reviews should be reported in a logical way, such as “thematically, chronologically, or in order of complexity” (Gregory & Denniss, 2018, p. 896). This narrative review is organized thematically as detailed in the discussion section. Following Robson and McCartan’s (2016) phases of thematic coding, the researchers familiarized themselves with the data. Each paper that was included in the review was read and notes were taken. To be able to code, the data were organized into groups to identify possible patterns or themes. Notes were captured in an Excel spreadsheet including title of paper, author(s), year of publication, journal name, purpose of study, research design/method, summary of findings, and a column for additional notes (see Table 1 for details). From the findings and additional notes, codes were then sorted into themes. Themes were identified primarily on the basis of repetition of words and phrases (Robson & McCartan’s, 2016). Common themes were identified and categorized as critical to employment success of individuals with ASD to the workplace. The themes generated from the review of the literature are meaningful collaboration, training and development, mentoring and coaching, and organizational support factors. The themes are recognized as activities that fall within the scope of HRD as described by Harbison and Myers (1964) and McLean and McLean (2001). However, the role that HRD professionals can play to improve employment success of individuals with ASD has been largely ignored in HRD research and practice.

Findings From the Literature

From a review of the extant literature, four themes were identified as key HRD-related activities that, with the expertise of HRD professionals, can improve employment readiness and retention levels of individuals with ASD in the workplace. The findings from the articles are organized based on the following themes: (a) meaningful collaboration, (b) training and development, (c) mentoring and coaching, and (d) organizational support factors. These themes form pillars of support for individuals with ASD as they transition and remain in the workforce (see Figure 2). In the workplace, HRD professionals can be influencers and drivers of these pillars of support.

Table 1. HRD-Related Themes From Literature Reviewed.

Author(s), year	Purpose	Findings	Theme(s)
Alverson & Yamamoto (2018)	10-year analysis of employment outcomes investigating predictor variables against the criterion variable, competitive employment	One significant predictor of employment outcomes was found; the number of vocational rehabilitation services provided	Meaningful collaboration
Brooke et al. (2018)	Address gap in the literature in employee retention and intervention in employees with ASD	Individuals with ASD retained higher competitive integrated employment when provided employment supports compared to those without	Organizational support factors
Coleman & Adams (2018)	Evaluate vocational status and government vocational services; improve employment of adults with ASD	Coaching and mentoring included as recommendations to improve vocational status	Coaching and mentoring
Morgan & Wine (2018)	Evaluation of behavioral skills training to teach four job skills to an 18-year-old student	Four restaurant skills were effectively taught using behavioral skills training	Training and development
Pfeiffer et al. (2018)	Examined the influence of social and sensory environments on job satisfaction of employees with ASD	Increased job satisfaction and retention when employers understand the importance of the relationship between environment and autistic employees	Organizational support factors
Van Laarhoven et al. (2018)	Explored how universally designed prompting systems support the teaching of vocational skills to individuals with ASD	Universally designed prompting systems can be created using software that is already available commercially leading to the likelihood of mobile device supports development by practitioners	Training and development
Waish et al. (2017)	Evaluation of video modeling as a means to support workplace inclusion	Social skills training intervention using video modeling contributes to social competence	Training and development
Crocco (2017)	Examined if covert audio coaching is a viable intervention strategy for increasing attending behavior	Covert audio coaching increases the classroom skill of individual with ASD	Coaching and mentoring
Hedley et al. (2017)	Reviewed empirical peer-reviewed studies on employment programs, interventions, and employment-related outcomes in adults with ASD	Lack of opportunities to develop workplace skills; multifaceted approach needed to explore employment outcomes of individuals with ASD	Meaningful collaboration; training and development
Nicholas et al. (2018)	Explored the ecosystem that exists between employment and individuals with ASD	Job readiness found in the context of the broad ecosystem is framed within components of supports	Organizational support factors
Pfeiffer et al. (2017)	Work satisfaction and performance of employees with autism focusing on social, attitudinal, and sensory environmental factors	Environmental factors and person-fit were perceived by individuals with ASD to impact experiences in the workplace. These factors were identified as barriers or facilitators	Organizational support factors
Skibell (2017)	Intensive technology organizations see the value of higher functioning individuals with ASD	Social skills awareness and training on both the applicant and workplace is needed for viability	Training and development
Wehman et al. (2017)	Project SEARCH was modified to determine its success with young adults with autism to acquire and maintain meaningful employment	Young adult with ASD can obtain and maintain competitive employment through customized interventions while showing more independence the more hours worked	Training and development; coaching and mentoring

(continued)

Table 1. (continued)

Author(s), year	Purpose	Findings	Theme(s)
Kaya et al. (2016)	Examination of demographic retrieved from the Rehabilitation Service Administration's Case Services Reports database to determine the impact on youth with ASD transitioning to the workforce	Transitioning—individuals with autism who received state and federal vocational rehabilitation services were significantly more likely to gain competitive employment	Meaningful collaboration
Wehman et al. (2016)	A 5-year review of 64 employees with ASD examined if gained employment via customized employment was effective	Customized employment with interventions is effective in increased work-retention, satisfaction, and maintaining competitive integrated employment	Organizational support factors
Gentry et al. (2015)	The facilitation of personal digital assistants as a means to support the needs and increased occupational performance of people with ASD	The use of Apple iPod Touch PDA can be used to improve work performance of individuals with ASD and lead to reduced personal support on the job	Training and development
Katz et al. (2015)	Measured the trajectory of work performance and quality of life on jobs of people with ASD over 9 months upon gaining employment from a work placement program	Participants maintain employment during period; important to provide individuals with ASD with work placing programs and follow-up during actual job performance	Meaningful collaboration
Meeks et al. (2015)	Developed a model to provide more support for autistic students that interconnects disability resources, career center, and counseling center	Collaborative employment resource model provides promising opportunities for individuals with ASD to receive career development support	Meaningful collaboration
Nicholas et al. (2015)	Systematic review of studies relating to ASD employees' intervention and supports	Review of the literature shows that vocational training and support is needed by both the ASD employee and the employer	Meaningful collaboration
Scott et al. (2015)	Examined the factors that lead to successful employment among ASD employees, expectations, supports, and productivity perspective	Both employee with ASD and employer appear committed to the employment process but there is still lack of understanding regarding workplace support, job expectation, and productivity requirements	Organizational support factors
Smith et al. (2015)	Explored the feasibility and efficacy of virtual reality job interview training in individuals with ASD	Virtual reality job interview training improved interviewing skills among trainees with ASD	Organizational support factors
Ham et al. (2014)	Studied a multifaceted support system to transition two youths with ASD through the transition process into employment	As a result of the implemented intervention, through training and coaching/mentoring two ASD employees held employment for at least 2 years with fading supports	Training and development; coaching and mentoring
Hart & Crippen (2014)	Examination of an eight-step, school-based employment training to increase employment	Eight research-based steps to provide an employment training program to students with autism to increase job attainment during their postsecondary years	Training and development
Smith et al. (2014)	Assessment of virtual reality job interview training in autistic adults	Virtual reality job interview training delivered via computer-based software, or the Internet supports the efficacy of virtual reality job interview training	Training and development
The Community School (2014)	Provided information relative to the hiring of individuals with ASD	Tax incentives provided by the government; support by the Americans With Disabilities Act; additional resources to aid employment	Meaningful collaboration

(continued)

Table 1. (continued)

Author(s), year	Purpose	Findings	Theme(s)
Walsh et al. (2014)	Review of the literature examined existing predictors and impact of employment among employee-aged individuals with ASD	Supportive work environment and teaching of vocational skills lead to more substantial employment outcomes and quality of life of individuals with ASD	Training and development; organizational support factors
Wehman et al. (2014)	Reported preliminary results of Project SEARCH plus Autism Spectrum Disorder supports model	Through internships, on-site systematic instruction and job coaches were provided to improve task acquisition	Training and development; meaningful collaboration; coaching and mentoring
Whezzel (2014)	Provided specific examples for job interview interactions for individuals with ASD	Preparing ASD individuals to improve skills for interviews significantly altered their social interactions in employment situations	Training and development
Bennett & Dukess (2013)	Literature review researching the effectiveness of teaching vocational and employment skills to secondary students	Behavioral skills training including instruction, modeling, practice, and feedback used to prepare individuals with ASD for work	Training and development
Bennett et al. (2013)	Examined the effects of covert audio coaching performing a job task on high school students with ASD	Using covert audio coaching job task accuracy and fluency improved during same task duties in a community-based worksite	Coaching and mentoring
Strickland et al. (2013)	Evaluated Internet-based training program to improve job interview skills for individuals with ASD	Web-based program used in tandem with a trained therapist can be an effective intervention in improving interview skills in autistic people	Training and development
Wilczynski et al. (2013)	Researched lack of employment and supports for individuals with ASD in the workforce	Supports and resources work to minimize ostracization and increased job satisfaction	Meaningful collaboration
Lee & Carter (2012)	Leveraged existing literature from vocational rehabilitation and school-to-work transition research to create a framework to facilitate transition to the workplace	Seven elements of transition services providing interventions for promoting successful employment in individuals with ASD	Meaningful collaboration; coaching and mentoring
Wehman, Lau et al. (2012)	Examination of supported employment in securing and maintaining competitive employment	Supported employment approach was successfully used in vocational rehabilitation; intervention time decreased over time	Training and development; organizational support factors; meaningful collaboration
Wehman, Schall et al. (2012)	Case studies examining the transition of individual with ASD into health care employment	Through goal setting, internships and training, Project SEARCH may offer a model to support ASD youth's transition into the workplace	Training and development
Mechling (2011)	Analyzed and synthesized literature (2000–2010) focusing on the impact of portable electronic devices within the moderate intellectual disabilities and autistic spectrum disorders populations	Use of portable electronic devices can be used to enhance training for skill development for individuals with ASD	Training and development
Taylor & Seltzer (2011)	Analysis of 66 young adults with ASD who have exited secondary school and their transition into postsecondary life, including employment	Service supports lacking for individuals with ASD as they transition into adulthood	Meaningful collaboration

(continued)

Table 1. (continued)

Author(s), year	Purpose	Findings	Theme(s)
Burke et al. (2010)	Evaluated a vocational training program to teach specific social-vocational skills	The intervention of behavioral skills training and performance cue system provides increased job workplace opportunities	Training and development
Hendricks (2010)	Review of evidence-based research about obstacles to successful employment of individuals with ASD	Support needed for successful employment of ASD individuals; interpersonal skills training needed to improve work experience	Meaningful collaboration; training and development; coaching and mentoring; organizational support factors
McDonough & Revell (2010)	Overview of employment outcomes research for individuals with autism	Two case studies provided insight into the development and implementation of employment plans	Training and development; meaningful collaboration
Perry Lattimore et al. (2008)	Examination of workers with ASD job-site training of vocational skills with training that includes simulation training	Evidence supports the utility of simulation training of adults with ASD to improve job performance	Training and development
Hillier et al. (2007)	Evaluation of nine ASD employees enrolled in a vocational support program	Vocational support program increased employment and income rates in employees with ASD	Training and development; coaching and mentoring; organizational support factors
Perry Lattimore et al. (2006)	Job-site training of vocational skills with training compared to the training that includes simulation training	Job-site training improves if accompanied by simulation training	Training and development
Hagner & Cooney (2005)	Qualitative data exploring the relationship between management and employees with ASD	Management/supervisor style influences employment success for autistic individuals	Organizational support factors
Howlin et al. (2005)	Examined the outcomes of individuals with ASD supported by employment services	On-the-job support is vital for employment success	Work-environment support factors
Müller et al. (2003)	Study to develop strategies for improving vocational placement and job retention service of autistic individuals	Job coach can help ASD employee to adjust more easily to the culture of the organization; maintaining structured jobs and consistent work schedules can support work of employee with ASD	Coaching and mentoring; organizational support factors
Luecking & Gramlich (2003)	Explained benefits, provided quality examples, and demonstrated models of work-based learning	Research indicated benefits of exposure to work experience; experiences should begin during secondary school; meaning and integrated employment should be available to all ASD individuals seeking employment	Meaningful collaboration
Capo (2001)	Review of existing literature to generate guidelines for occupational therapy roles for individuals with ASD	Job coach plays important role in identifying job that matches skills of individuals with ASD and teaching the required job skills	Coaching and mentoring

Note. ASD = autism spectrum disorder; PDA = personal digital assistant.

Meaningful Collaboration

Meaningful and integrated employment should be available to all job-seeking individuals with ASD (Hendricks, 2010; Luecking & Gramlich, 2003). Nicholas et al. (2018) described the employment of individuals with ASD as “inextricably linked to broader community resources, family support, workplace capacity building . . . and policy” (p. 264). Therefore, a multifaceted approach is needed to facilitate successful employment outcomes (Hedley et al., 2017). As noted in the literature, this collaborative approach starts with the family having the responsibility to understand ASD and how it affects the individual on the spectrum. The school system is another form of support for individuals with ASD (Ennis-Cole, 2019). Collaboration and interagency involvement play a vital role to ensure quality and seamless transition from school to work through effective employment training and workplace readiness (Hart Barnett & Crippen, 2014; Lee & Carter, 2010). Individuals with ASD have access to a variety of services provided through agencies including State Vocational Rehabilitation programs, community rehabilitation service providers, and state- and community-level developmental disabilities programs. A State’s Vocational Rehabilitation Center is positioned as the hub to facilitate the move from secondary education to employment (McDonough & Revell, 2010). Within this agency, an individualized plan for employment is created and serves as a guide for transitioning into the workplace (McDonough & Revell, 2010). Individuals who receive vocational services and job readiness training are more likely to gain employment (Alverson & Yamamoto, 2018; Kaya et al., 2016).

Assistance from state agencies include job placement services, employment support programs, community/vocational training (Hendricks, 2010; McDonough & Revell, 2010), on-the-job training, career counseling, assessment of job fit, supported and customized employment, and employment specialists services (Hendricks, 2010; McDonough & Revell, 2010; Nicholas et al., 2017) to help the employee adjust to the organizational culture and work responsibilities (Wehman, Lau, et al., 2012). While these services can foster increased remunerative and rewarding employment opportunities (Hart Barnett & Crippen, 2014), the availability of resources is often limited in comparison to the need (Nicholas et al., 2018).

Although vocational rehabilitation plays a vital role in preparing persons with ASD for employment, only about one third obtain jobs through this service (Alverson & Yamamoto, 2018). The tax incentive provided by the government to employers who hire individuals with autism may lead to increased job opportunities (The Community School, 2013), but currently many factors contribute to the unemployment issues experienced by individuals with ASD. For example, curriculum and instructional practices in secondary special education do not provide adequate preparation for work (Bennett & Dukes, 2013), transition planning and programming are not available in some schools (private, charter, etc.), and individuals with ASD are not always the beneficiaries of active and early transition planning activities and resources. (See <https://www2.ed.gov/about/offices/list/osers/transition/products/postsecondary-transition-guide-2017.pdf>) Some state agencies work in collaboration with secondary

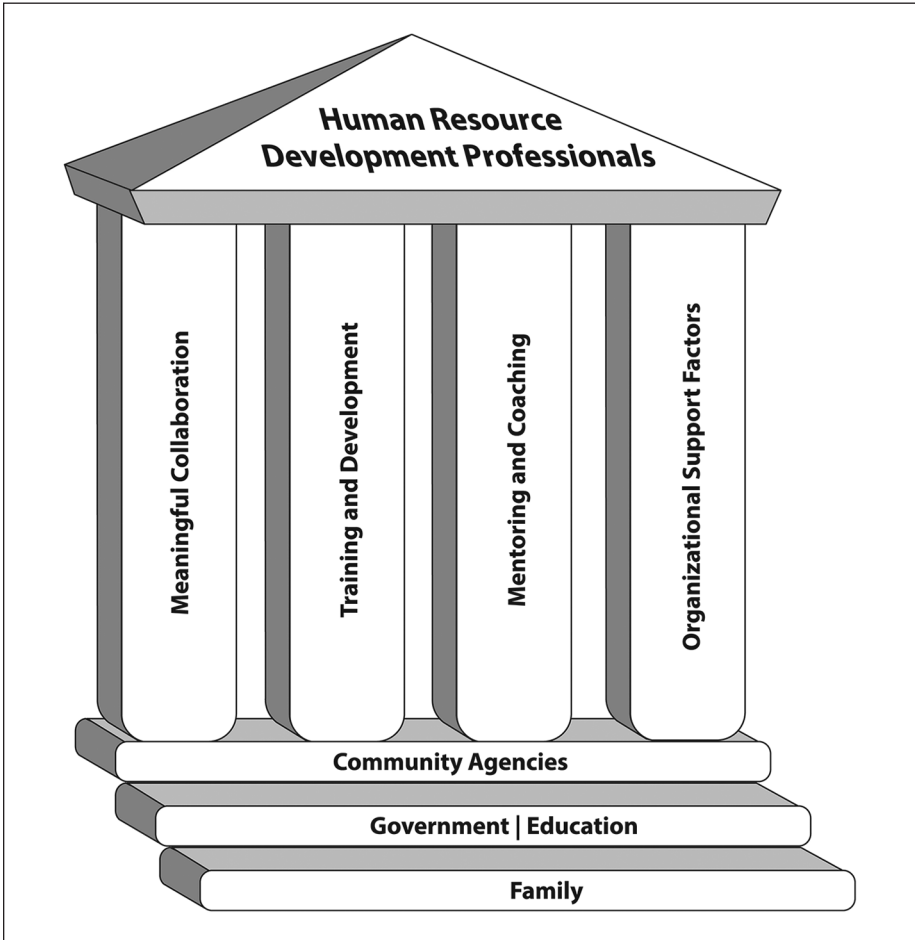


Figure 2. Pillars supporting the transition and success of individuals with ASD to the workforce.

Note. ASD = autism spectrum disorder.

schools to offer work experience programs (Alverson & Yamamoto, 2018). These programs should connect to real-world experiences, provide prevocational tasks, supply training materials that closely resemble actual work processes, and initiate the process to instill workplace skills and competencies as early as secondary school (Bennett & Dukes, 2013). Meeks et al. (2015) noted the importance of aligning college support services with career development of individuals with ASD. Work placement programs (Katz et al., 2015) and intensive internship programs have proven to be helpful for individuals with ASD to gain and retain paid employment (Wehman et al., 2014) but not many organizations have extended the opportunity to this underrepresented

population. The current system is not adequate to accommodate the needs of adults with ASD as they transition to the workplace (Taylor & Seltzer, 2011). Scholars argue that there is need for state/community-based agencies to boost employment outcomes (Nicholas et al., 2015) because positive employment outcomes are likely to occur when there is collaboration between the education system and vocational rehabilitation (Wilczynski et al., 2013).

Training and Development

Research has shown that with the appropriate training interventions, adults with ASD can work effectively in different organizational settings (Hillier et al., 2007). Various types of training techniques have been utilized to improve skills, competences, and behaviors needed for the workplace (Hedley et al., 2017). Although the individual would have entered the workplace with skills from secondary school and vocational programs, additional and customized training is necessary to increase skill acquisition on-site (Wehman, Lau, et al., 2012). On-the-job training can promote job retention and is beneficial for providing learning opportunities in an actual job setting (Hendricks, 2010; Wehman, Lau, et al., 2012). On-the-job training coupled with off-site simulation training results in increased skill acquisition and transfer of training to the job itself (Perry Lattimore et al., 2006, 2008). Intensive internship training, guided by Applied Behavior Analysis, has also resulted in increased possibilities of gaining a job (Wehman et al., 2014, 2017; Wehman, Schall, et al., 2012). Scholars have suggested using principles derived from Applied Behavior Analysis (Burke et al., 2010) that include role-playing (Whetzel, 2014), modeling, video modeling, and visual support (Hart Barnett & Crippen, 2014; Hendricks, 2010; Van Laarhoven et al., 2018). Through behavioral skills training, individuals with ASD are taught job skills successfully in the natural work environment (Morgan & Wine, 2018).

Research has shown that technology-enhanced training is a highly effective technique for individuals with ASD to learn job skills and support employment independence (see Gentry et al., 2015; Van Laarhoven et al., 2018). For example, simulation training and behavioral skills training through the use of various mobile technology applications such as the iPhone and iPad have been found to be successful training interventions (Perry Lattimore et al., 2008). It is evident from research that mobile technological devices are used for visual and/or auditory supports to successfully demonstrate task-oriented skills that help to improve job dependence. Mobile technologies with universally designed features such as touch screen and voice recognition have been found to enhance learning (Mechling, 2011; Van Laarhoven et al., 2018). The use of iPod Touch personal digital assistant (PDA) supports employment independence, and individuals with PDA may need less hours of job coaching support (Gentry et al., 2015).

Virtual reality training has been used as an intervention to improve job-interviewing skills for individuals with ASD (Smith et al., 2014, 2015; Strickland et al., 2013). Individuals who received the virtual reality job interview training (VR-JIT) demonstrated an increase in verbal content skills (Strickland et al., 2013), social skills, and

were more likely to obtain competitive employment (Smith et al., 2015). The VR-JIT is a computer software application that consists of repetitive simulated job interviews with a virtual character and didactic training (Smith et al., 2014). Virtual reality training can be more advantageous than traditional types of training, in that, there is opportunity for (a) repetitive practice with the simulation, (b) active participation, (c) accurate representation of real-life simulation, (d) opportunities for trainees to make and correct mistakes, (e) consistent and momentary feedback, and (f) access to web-based learning materials before and during the simulation (Issenberg et al., 2005). Together, these training and development interventions have equipped individuals with ASD with the necessary competences needed to gain employment and experience greater independence on the job (Ham et al., 2014). These specific types of training that help with obtaining employment can be transferred to the workplace for continuous improvement.

Mentoring and Coaching

Mentoring has been viewed as effective for individuals with learning disabilities and mental health issues (Brown et al., 2010). Research also shows that mentors have helped to improve social interactions between individuals with and without disabilities (Storey, 2003). Peer mentors are recommended on-the-job to help the employee with ASD refine his or her social skills and develop problem-solving skills related to employment. These efforts improve employment outcomes for employees with ASD (Coleman & Adams, 2018).

Job coaching has been used in the workplace as a beneficial intervention for individuals with ASD (Ham et al., 2014; Wehman et al., 2014). A job coach plays several roles in the process of transitioning to employment: provide job shadowing for the individual to have a deeper understanding of the job and to determine job fit (Coleman & Adams, 2018), teach the person with ASD the required job skills, and educate employees about autism and individual needs (Capo, 2001). A job coach can aid in the provision of comprehensive methodical training during the earlier stages of employment and once the tasks are learned and workplace policies and procedures are understood, the coach can eventually fade (Hendricks, 2010; Hillier et al., 2007). Through covert audio coaching, an individual on the autism spectrum can perform work tasks more accurately and effectively (Bennett et al., 2013). Covert audio coaching involves an instructor who provides performance feedback, guidance, prompts, or corrections, from a distance, through the use of a technological device (Crocco, 2017).

Job coaches have been employed in intensive internship programs to help individuals with autism acquire and maintain jobs (Wehman et al., 2014, 2017) and more easily adjust to the culture of the organization (Müller et al., 2003). Findings from a business-based model using students with ASD as interns in a suburban hospital indicated that a “protracted intensive immersion in the workplace through internships can be a powerful way to achieve competitive employment upon graduation from high school” (Wehman et al., 2014, p. 498). Co-workers were trained to be mentors and

coaches by working closely with the interns to ensure that skills were learned, jobs were performed to meet employers' expectations, and appropriate job behaviors, including social skills, were displayed. The mentor or coach provided support until the intern with ASD demonstrated the ability to work independently (Wehman et al., 2017). Coaching and mentoring are techniques that can foster self-determination and independence (Lee & Carter, 2010).

Organizational Support Factors

The absence of understanding and support from co-workers can pose a challenge for employees with ASD (Hagner & Cooney, 2005). Studies show that on-the-job support is vital for workplace learning and success (Howlin et al., 2005). When employers and employees have greater awareness of ASD, they will be more welcoming, accommodating, and supportive of individuals with ASD (Hendricks, 2010; Nicholas et al., 2018). Employer and employee knowledge of ASD can help strengthen relationships through supervisor and peer support (Nicholas et al., 2018). "Co-worker involvement in onsite work experience and learning was viewed as important for collegial/peer relationship building, mutual learning, and social skill development" (Nicholas et al., 2018, p. 270). Although both employers and employees with ASD appear to be committed to the employment process, there are still misunderstandings of job expectations and performance requirements that serve as barriers to maintaining employment (Scott et al., 2015). The qualifications and potential of the employee with ASD have proven to be less of a concern when compared with the ability to meet social expectations and requirements in the work environment (Hendricks, 2010; Pfeiffer et al., 2017).

Research indicates that individuals with autism benefit from customized employment as an ongoing supported employment service (Brooke et al., 2018; Wehman et al., 2016). Employment support encompasses services such as employer/supervisor support, co-worker support, and assistive technology (Wehman et al., 2016). Customized employment occurs when an employment specialist and the job applicant (with the disability) collaborate with an employer to create a job description that aligns with the skills of the applicant while also satisfying the needs of the employer (Wehman et al., 2016). Person-environment fit in the workplace impacts levels of job satisfaction and performance (Pfeiffer et al., 2017, 2018). In general, on-the-job support can promote job retention (Wehman, Lau, et al., 2012).

Many individuals with ASD need support to learn job tasks and to maintain employment (Van Laarhoven et al., 2018). Employers can contribute to successful work experiences of individuals with ASD through modification of the work environment, job tasks, and expectation of social interaction (Hendricks, 2010; Walsh et al., 2014). Workplace accommodation strategies have proven to be beneficial. These strategies include maintaining consistent work schedules, workload accommodations, providing highly structured jobs, supplying a description of the task(s), and communicating in a direct way (Muller, Schuler, Burton, & Yates, 2003; Nicholas et al., 2018; Walsh et al., 2014). Other basic environmental modifications include noise level, crowding, and

lighting (Hillier et al., 2007). With the progression of time, some of these supports can be faded while others may remain (Walsh et al., 2014).

Discussion

This study reviewed literature to identify and explore various strategies that can be used in the workplace to foster skill development and the success of employees with ASD and the potential role of HRD professionals to improve their work outcomes.

In the collaborative multifaceted and multidisciplinary network needed to facilitate employment success of individuals with ASD (Hedley et al., 2017), HRD professionals can represent the workplace by serving as a conduit between agencies and education systems. HRD professionals can provide support for career development pathways for employees with ASD. Career development, a core component of HRD, is described as a collaborative process “requiring individuals and organizations to create a partnership that enhances employees’ knowledge, skills, competencies, and attitudes required for their current and future job assignments” (Gilley et al., 2002, p. 94). As Herr (2001) articulated, one of the many practices of career development is to “provide hope to people, the affirmation of their individual dignity and worth, and the support to establish new career directions” (p. 207). Individuals with ASD who obtain employment gain a sense of purpose and belonging because of the level of independence the job provides (Hurlbutt & Chalmers, 2004). Collaborative work between schools and vocational/community rehabilitation centers and other support services will result in positive outcomes (Wilczynski et al., 2013). However, it is challenging to improve employment outcomes without input from organizations. When organizations are integrated in this collaborative approach, more robust, coordinated, and comprehensive plans can be developed to make a greater impact.

Training and development are central HRD activities (Harbison & Myers, 1964; McLean & McLean, 2001). Training is the process through which skills are developed and attributes are nurtured, to help employees work more effectively and efficiently on-the-job (Davis & Davis, 1998). If training plays such a crucial role to prepare individuals with ASD with the skills needed for employment, HRD professionals, as industry representatives, can assist in spearheading training and development initiatives in the workplace through partnerships with secondary and postsecondary educators, community, and state agencies, to ensure that the appropriate work skills are being nurtured. For example, HRD professionals can represent business and industry by collaborating with community agencies and educational institutions to determine the skills set of individuals with ASD and to offer internship and/or apprenticeship programs that will provide real-world learning experiences and opportunities for further skill development that can be applied to jobs in the workplace.

The advancements in technology have revolutionized the workplace (Li, 2013), and sophisticated technology is now used in organizations to “support learning at work, enhance job performance, and facilitate organizational development and change” (Benson et al., 2002, p. 392). Individuals with ASD learn job skills through

technology-enhanced training, and increasing numbers are being trained for technology-related jobs (Skibell, 2017). Organizations can adapt technology-based training to facilitate continuous learning and skill development. Technology-enhanced training may also benefit other employees, especially Generation X and Z employees, who are more technologically savvy than their predecessors and may prefer high-tech learning tools.

Mentoring is an important career training and development tool (Hunt & Michael, 1983). HRD plays an important role in the effectiveness of mentoring programs (Hegstad, 1999; Hezlett & Gibson, 2005). Mentees acquire knowledge and develop skills through the mentoring relationship (Hezlett & Gibson, 2005) to enhance their career, professional, and personal development (Noe, 1988; Russell & Adams, 1997). A successful mentoring relationship can yield a sense of competence, increase levels of satisfaction (Hegstad, 1999), motivation, work commitment, retention, and performance (Fagenson-Eland et al., 1997)—all of which are outcomes of HRD (Hezlett & Gibson, 2005) and activities that can be supported by HRD professionals.

Through coaching, an employee's competence, learning, and performance can be enhanced. A coach provides "goals, techniques, practice, and feedback" on job tasks to increase the employee's success and improvement in work relationships. Like mentoring, coaching is an essential area of expertise that is a key function of HRD professionals (Ellinger & Kim, 2014; McLagan, 1996). Both mentoring and coaching are organization development interventions used to improve employee development and performance outcomes (Kim et al., 2013). With assistance from agency representatives, HRD professionals can drive successful mentoring and coaching initiatives for employees with ASD.

Organizational support as described in the HRD literature is the degree to which the workplace values and cares about the well-being of the employees (Eisenberger et al., 1986). An organization that offers support "may be seen as offering a form of inducement to the employee and so may create a sense of obligation in the employee to the organization" (Allen et al., 2003, p. 103). HRD professionals can support employees with ASD by redesigning work environments to accommodate their needs and ensure high levels of job involvement, fulfillment, and efficient performance (Torraco, 2005).

Various factors, including supervisor and peer support within the work environment, can impact the transfer of post-training behaviors (Ford & Weissbein, 1997). Although employees on the autism spectrum receive training, the absence of support from peers and supervisors can impact job performance. Co-workers' willingness to provide work-related assistance to aid in the completion of job tasks is highly valued (Susskind et al., 2003). Employees with ASD reported an increase in job satisfaction when supervisors nurtured their strengths and when co-workers were willing to assist them as they mastered new job tasks (Müller et al., 2003). As gleaned from the HRD literature, supervisor- and peer-support are key factors that affect learning and performance on the job for employees (Cromwell & Kolb, 2004; Noe & Wilk, 1993). As noted by Torraco and Lundgren (2019), "today, HRD is diffused and integrated into a broad range of leadership and supervisory roles" (p. 1).

Implications for Research and Practice

The study extends previously conducted research on people with disabilities by identifying strategies to help employees with ASD transition and function successfully in the workplace. A lack of attention to diversity education and research is reflected in a number of HRD and management programs failing to integrate diversity related courses into textbooks, curricula, and research (Bierema, 2010). Universities should offer diversity courses with an ASD component to heighten students' (future industry leaders/managers) awareness of the employment-related challenges of the ASD adult population and the work that few employers are doing to provide job opportunities to this population. An early exposure to employment barriers will help to remove the stigma associated with their employment (Hidegh & Csillag, 2013), fill the gap between education and practice (Kuchinke, 2002), and hopefully inspire future researchers to further investigate workforce needs of individuals with ASD.

The study has implication for HR professionals, industry leaders, and managers, as well as employees. As experts in training design and delivery, HRD practitioners can work with vocational rehabilitation agencies, medical and psychology professionals to develop and implement training for employees to increase their awareness of autism (Hillier et al., 2007), to foster employers and employees' knowledge and understanding of individuals with ASD, to promote relationship building, and to ensure accommodation and support for employees on the spectrum. Support programs should be developed to inform employers and colleagues in the workplace of the strengths and challenges of individuals with ASD (Frank et al., 2018). Training on ASD will help to reduce employers' misunderstandings of job and performance expectations that often lead to turnover. ASD training for employees will extend the various types of diversity training noted in the HRD literature (Alhejji et al., 2016). According to Ross-Gordon (2002), instructors and trainers include assumptions and bias associated with disability into training and classroom activities. Ross-Gordon cautioned adult educators to be aware of the bias and amend it.

As an extension of vocational training programs, industry leaders can work more closely with community agencies and schools, to provide internship and apprenticeship opportunities to foster talent and skill development to aid in streamlining a less challenging transition as the individual on the spectrum moves from a postsecondary experience into the workplace.

A number of the strategies used to promote work performance for individuals with ASD can also benefit the entire workforce. As noted by Wehman et al. (2014), supervisors are using positive reinforcement to support all employees because of the interaction and observation of intensive internships for individuals with ASD. Moreover, the technology-enhanced training found to be ideal for individuals with ASD are in line with current research promoting the advancement of the utilization of smart learning in the workplace. The rapid development of smart devices and sensing technologies play a major role in facilitating a new paradigm of learning called "smart learning" (J. Lee et al., 2015). Smart learning adoption in the workplace will soon become more

widespread as the more traditional models of learning/training in the workplace will no longer suffice.

Limitations and Recommendations for Future Research

Although this study helps to give shape to the topic and builds on the literature, there are limitations worth noting. During the search process, specific parameters were set for the study to make it more practicable given time constraints and although selection criteria for narrative reviews are more compromising, relevant papers may have been missed and excluded from the study. The limited sample sizes of the peer-reviewed articles included in the study may be a possible limitation of this study. A few of the studies were pilot tested; others were case studies with small number of participants. Research on the employment experiences of individuals with ASD in the workplace is still scarce and scattered over a wide variety of journals from multiple disciplines.

Further research is needed to improve workplace transition and to determine strategies to increase employment outcomes of individuals with ASD. The four themes generated from the study that are reflected in Figure 2 as the pillars supporting the transition and success of individuals with ASD to the workplace are functions of HRD. HRD professionals can influence these supporting pillars by contributing to the skills and capacities of individuals with autism. With a small percentage of the ASD adult population being adequately prepared with skills to obtain gainful employment, there is a need to advance inquiries, using both qualitative and quantitative research methodologies to investigate interventions and supportive strategies for the workplace. More empirical research on employees with ASD will make a valuable contribution to the HRD literature through investigation of employment work attitudes and outcomes including work engagement, job satisfaction, organizational commitment, turnover intention, job retention, and other important variables that can influence increased employee and organizational outcomes. It is also critical to explore employees with autism motivation for, benefits of, and colleague/supervisor support for training to determine the impact on their work performance. Assessing the influence of mentoring and coaching from the perspective of both the mentor/coach and the employee with ASD will provide evidence of the benefits or limitations of these relationships. Other research can further examine the needs, barriers, and benefits of individuals with ASD in the workplace through interviews with employees with ASD and their managers/supervisors, and peers to understand factors that work well or is in need of improvement. Comparing the work outcomes of employees with ASD and other employees will also be another significant area to explore and to inform organizational leaders who may be contemplating employment offers for this population. HRD researchers can also conduct more critical investigation on how the experiences of people with ASD in the workplace differs depending on their varied challenges. Individuals with ASD in the workplace can be explored in various country and culture contexts.

It is important to note that research involving individuals with ASD may require extra effort and understanding considering their social and communication challenges. A qualitative interview study may need to utilize a structured approach with interview

guide and questions sent to participants with ASD ahead of interview date to allow time to prepare and ensure a smoother process. Notes from interview can be sent to interviewees for validation. Interviews should be kept short and can be conducted online or in person based on the interviewees' preference. The researcher can allow short breaks during the interview. The designated room/space for the interview should be conducive for the conversation and free of distractions. Researchers should be mindful of surveys that may be too lengthy for individuals with ASD. The option to complete survey/questionnaire in parts should be allowed.

Future research should also have a multidisciplinary and multifaceted approach (Hedley et al., 2017) as successful employment outcomes of individuals with ASD will require an integrative role of various stakeholders and systems (Nicholas et al., 2018). Individuals with autism long for a sense of contribution and accomplishment that stems from having a job, and some have the capabilities to be successful in the workplace with the implementation of appropriate interventions and adequate support systems. In keeping with the underlying definitional philosophies of HRD, HRD professionals can play a role in this multifaceted approach to ensure successful work outcomes of individuals with ASD by creating channels to participation in the workforce to create a better society for all.

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