A Review of Literacy Interventions for Adults With Extensive Needs for Supports

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Starting with high expectations, building instruction around each individual's goals, and using systematic, integrated instruction helps adults with disabilities learn and improve literacy skills.

Acquiring literacy skills is critical for all adults. Literacy can empower an individual to be an active citizen in the democratic process, open up educational and employment opportunities that can lead to economic stability (e.g., deFur & Runnells, 2014), facilitate health and well-being (Taggart & McKendry, 2009), create access to recreation and leisure activities, and enhance self-confidence (van Kraayenoord, 1994). Acquiring even rudimentary literacy skills can increase social interaction, leading to a greater sense of belonging (e.g., Forts & Luckasson, 2011).

Lack of literacy skills is a critical issue for many adults in the United States and around the world (Hock, 2012). The 2003 National Assessment of Adult Literacy, for example, reported that an estimated 56 million adults in the United States have basic or below-basic skills, defined in this assessment as reading only simple words and phrases in familiar contexts (Lesgold & Welch-Ross, 2012). Their opportunities for employment and full participation in many aspects of life are likely to be restricted by their poor literacy skills (Hock, 2012).

There has been limited research on literacy education for individuals considered to have basic or below-basic literacy skills despite a compelling need for effective instruction for them (Lesgold & Welch-Ross, 2012). We know even less about literacy instruction for a subgroup of this population: adults with extensive support needs (Erickson, Koppenhaver, & Yoder, 1994). In this review, we define this population as individuals who require assistance across all aspects of their daily lives (AAIDD Ad Hoc Committee on Terminology and Classification, 2010); we include individuals with intellectual disability (ID), autism spectrum disorder, or multiple disabilities within this group. Data on literacy levels of this smaller group are not systematically included in national surveys such as the National Assessment of Adult Literacy (Kutner et al., 2007). Thus, we know little about how or if they have access to literacy instruction, or the characteristics of any instruction that might be provided.

Instruction for adults must consider their typically pragmatic, problem-centered orientation to learning (Darvin, 2006). Motivation, self-direction, and task/learning organization all seem to play important roles in the experiences of most adult learners, depending on the context and the individual's background and learning characteristics (Merriam, 2001). Because of the paucity of research on adults with extensive support needs, we do not know whether literacy instruction for them incorporates elements of quality adult instruction, such as teaching skills using multiple texts or teaching within a meaningful context toward a self-selected goal (Lesgold & Welch-Ross, 2012).

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Existing information on the literacy abilities of adults with extensive support needs suggests that their poor literacy skills are due to several factors in addition to their cognitive and communication challenges. Most significantly, many disability professionals continue to hold low expectations for the potential of individuals with more severe disabilities to acquire literacy skills. As a result, many adults with such disability labels did not receive appropriate, individualized, systematic, and sustained literacy instruction while they were in school and therefore did not acquire literacy knowledge and skills (Copeland & Keefe, 2007; Erickson et al., 1994). Lack of teacher knowledge about effective literacy instruction for these individuals is another factor at play. Copeland, Keefe, Calhoon, Tanner, and Park (2011) found that many teacher preparation programs do not routinely include content and practical experiences related to literacy instruction for students with extensive support needs. Finally, educators' prevailing belief that children who do not learn to read in early formal instructional settings never will often results in a lack of access to high-quality instruction for older students and adults and further limits learning opportunities (Moni, Jobling, Morgan, & Lloyd, 2011).

Increased research and attention is now being paid to literacy instruction for school-age children with disabilities such as ID (Allor, Mathes, Roberts, Cheatham, & Champlin, 2010). The field now also recognizes that literacy learning is a lifelong process, not something that ends when compulsory education stops (Moni et al., 2011). We are not aware of any systematic review of the literature that has examined literacy instruction provided to adults with extensive support needs. It seems an opportune time, then, to investigate literacy instruction for these adults to determine who has been included in research in this area and what effective instructional strategies are for these learners.

Literacy encompasses both the skills needed to make meaning out of symbols (e.g., decoding and encoding text) and the broader uses of literacy within an individual's life (e.g., using literacy skills to locate information on a favorite musical group; Schachter & Galili-Schachter, 2012). We decided to begin work in the broad area of literacy instruction for adults with extensive support needs by first investigating instructional interventions to teach acquisition of the skills needed to read (e.g., word recognition, reading comprehension). A second review of the literature (in preparation) focuses on describing and evaluating the types of literacy instruction programs available to adults, such as community adult education programs. It seems logical to first examine effective skill instruction and then consider if/how these instructional practices are embedded within adult educational programs to facilitate the multitude of ways that adults use literacy in their everyday lives. Therefore, in this review, we sought to describe the participants in this area of research, the types of literacy targets represented, the types of interventions used, and the outcomes of these interventions.

Method: Search Terms and Number of Articles Found

We systematically searched all relevant EBSCOhost and ERIC databases electronically using combinations of two groups of terms. The first group of terms was *adults with* (each of the following) *intellectual disabilities*, *developmental disabilities*, *severe disabilities*, *autism spectrum disorders*, *autism, Down syndrome*, *multiple disabilities*, *mental retardation*, and *disabilities*. These terms were searched in combination with a different set of terms: *reading*, *writing*, *communication*, *learning opportunities*, *literacy*, *literacy instruction*, *literacy opportunities*, *literacy learning opportunities*, *literacy definitions*, and *definitions of literacy*. This resulted in 80 documents. We compiled literacy intervention studies, qualitative or experimental, that were published in a scholarly, peer-reviewed journal; included at least one participant who was 18 or older and had ID or other developmental disability, such as autism multiple disability, and/or diagnoses associated with ID, such as Down syndrome; and written in English.

We did not include studies that focused on individuals with learning disabilities, Asperger's syndrome, or high-functioning autism because these individuals do not typically require support across all aspects of their lives and are likely to have had very different prior literacy instruction than adults with more severe disabilities (Allor et al., 2010). We also excluded documents that were non-peer-reviewed articles (e.g., unpublished dissertations), books or book chapters, studies in which the primary purpose was to develop an assessment instrument, studies in which the primary focus was on development of a tool or instrument instead of on the effects of such a tool or instrument on the literacy skills of adults with disabilities, or program description articles. This process yielded 17 peer-reviewed intervention research articles (see the articles marked with an asterisk in the References section).

Findings

Studies meeting our inclusion criteria were published between 1982 and 2013, and most (13) were published

between 2002 and 2013. Researchers in six studies employed single-case designs. Researchers used group designs in six other studies, a case study design in four studies, and an action research design in one study.

Participants and Settings

A total of 169 adults between the ages of 18 and 57 participated in the studies. Fifteen studies reported participants' gender, of which 72 were female and 65 were male. Hua, Therrien, et al. (2012) were the only researchers who reported participants' ethnicity; all of their participants were Caucasian.

Participants in 14 studies had a primary diagnosis of ID, and participants in three studies had a primary diagnosis of autism. Some participants had secondary diagnoses, such as cerebral palsy, Prader–Willi syndrome, Down syndrome, seizure disorder, attention deficit disorder, or hearing loss. Most researchers reported only participants' disability label or IQ score rather than formal data on adaptive behavioral functioning levels.

Researchers in 10 studies described intervention settings. Six took place in university postsecondary educational programs. Two took place in either an adult day activity center or vocational workshop, one took place in participants' homes and local communities, and one took place in an institutional setting.

Literacy Targets and Interventions

Many of the reviewed studies focused on multiple literacy targets and combined more than one instructional strategy or approach into an intervention package. Researchers measured target skills using researcher-created direct measures (e.g., number of comprehension questions answered accurately), standardized measures to assess changes in skills pre–post intervention (e.g., Dynamic Indicators of Basic Early Literacy Skills), and/or qualitative measures (e.g., field notes). Several studies employed more than one type of measure (e.g., field notes with percentage of words read correctly).

We carefully examined studies and categorized them according to the primary target skill and intervention strategy used (see Table 1). Intervention targets fell into three general categories: word identification, with and without a focus on word meaning; reading or listening text-level comprehension of narrative or expository text; or multiple literacy targets taught within integrated instruction.

We grouped interventions into four general categories based on the *primary* intervention identified by the researchers. Some researchers identified a primary intervention used in conjunction with additional intervention components, such as pairing symbols with words to teach word recognition but doing so using time delay procedures (Hill, 1995).

These primary intervention categories were behavioral strategies, which used tightly controlled presentation of items to be taught and strategic use of reinforcement; visuals, such as symbols; strategy-based interventions; and multiple-component interventions. We defined the last category as interventions that included strategies to teach multiple components of literacy within integrated lessons rather than using a single intervention to teach only one component, such as solely teaching sight words (Allor et al., 2010). In the past, most interventions with this population taught only one skill, usually sight words, in an isolated manner (Browder, Wakeman, Spooner, Ahlgrim-Delzell, & Algozzine, 2006). More recently researchers have begun to examine interventions that address all components of literacy in a comprehensive, integrated manner.

Some studies compared the effectiveness of two or more interventions or conditions on literacy skill acquisition (e.g., Hill, 1995). Others examined the efficacy of a single intervention on one or more literacy targets (e.g., Dogoe et al., 2011). Next, we describe the types of literacy targets and interventions across studies.

Behavioral Strategies. The most widely used primary intervention approaches were behavioral teaching strategies, such as time delay. Time delay begins by simultaneously showing and reading/defining a word and asking the student to repeat the word/definition. The teacher then presents the word but waits a specified number of seconds for the student to respond before providing a prompt. This continues until the student responds independently. Seven of these studies focused on teaching word recognition. Hua et al. (2013) used these strategies to teach vocabulary and comprehension.

Researchers in four studies used a time delay procedure in conjunction with other procedures to teach literacy skills. Dogoe et al. (2011), for example, used time delay to teach product warning label sight words and their definitions to young adults with autism.

Participants learned to read and provide definitions of label words and were able to generalize these skills across novel products but not across settings. Orelove (1982) taught common recipe words on flash cards to pairs of adults with extensive support needs using a five-second time delay procedure. He checked whether one member of a pair learned the other member's words through observation alone without direct instruction. Interestingly, he found that all pairs, even though randomly assigned, performed similarly when learning new

Table 1
Primary Literacy Targets and Interventions

Primary target	Primary intervention			
	Behavioral	Visual	Strategy	Multicomponent
Word recognition				
Sight word only	Orelove, F.P. (1982). Acquisition of incidental learning in moderately and severely handicapped adults. *Education and Training of the Mentally Retarded*, *17*(2), 131–136. Worsdell, A.S., Iwata, B.A., Dozier, C.L., Johnson, A.D., Neidert, P.L., & Thomason, J.L. (2005). Analysis of response repetition as an error correction strategy during sight-word reading. *Journal of Applied Behavior Analysis*, *38*(4), 511–527.	Hill, L. (1995). An exploratory study to investigate different methods for teaching sight vocabulary to people with learning disabilities of differing aetiologies. *Down Syndrome Research and Practice*, *3*(1), 23–28.		
Sight word with meaning	Dogoe, M.S., Banda, D.R., Lock, R.H., & Feinstein, R. (2011). Teaching generalized reading of product warning labels to young adults with autism using the constant time delay procedure. *Education and Training in Autism and Developmental Disabilities*, *46*(2), 204–213. Lalli, J.S., & Browder, D.M. (1993). Comparison of sight word training procedures with validation of the most practical procedure in teaching reading for daily living. *Research in Developmental Disabilities*, *14*(2), 107–127. Stromer, R., Mackay, H.A., Howell, S.R., McVay, A.A., & Flusser, D. (1996). Teaching computer-based spelling to individuals with developmental and hearing disabilities: Transfer of stimulus control to writing tasks. *Journal of Applied Behavior Analysis*, *29*(1), 25–42.			

(*continued*)

Table 1
Primary Literacy Targets and Interventions (*continued*)

Primary target	Primary intervention			
	Behavioral	**Visual**	**Strategy**	**Multicomponent**
Decoding	Stewart, K., Hayashi, Y., & Saunders, K. (2010). Enhancing vowel discrimination using constructed spelling. *Analysis of Verbal Behavior*, *26*(1), 57–64.			
Text comprehension				
Reading	Hua, Y., Woods-Groves, S., Kaldenberg, E.R., & Scheidecker, B.J. (2013). Effects of vocabulary instruction using constant time delay on expository reading of young adults with intellectual disability. *Focus on Autism and Other Developmental Disabilities*, *28*(2), 89–100.	Jones, F.W., Long, K., & Finlay, W.M. (2007). Symbols can improve the reading comprehension of adults with learning disabilities. *Journal of Intellectual Disability Research*, *51*(7), 545–550.	Hua, Y., Hendrickson, J.M., Therrien, W.J., Woods-Groves, S., Rice, P.S., & Shaw, J.J. (2012). Effects of combined reading and question generation on reading fluency and comprehension of three young adults with autism and intellectual disability. *Focus on Autism and Other Developmental Disabilities*, *27*(3), 135–146. Hua, Y., Therrien, W.J., Hendrickson, J.M., Woods-Groves, S., Ries, P.S., & Shaw, J.W. (2012). Effects of combined repeated reading and question generation intervention on young adults with cognitive disabilities. *Education and Training in Autism and Developmental Disabilities*, *47*(1), 72–83. Morgan, M., Moni, K., & Jobling, A. (2004). What's it all about? Investigating reading comprehension strategies in young adults with Down syndrome. *Down Syndrome Research and Practice*, *9*(2), 37–44. van den Bos, K.P., Nakken, H., Nicolay, P.G., & van Houten, E.J. (2007). Adults with mild intellectual disabilities: Can their reading comprehension ability be improved? *Journal of Intellectual Disability Research*, *51*(11), 835–849.	

(*continued*)

Table 1
Primary Literacy Targets and Interventions (*continued*)

Primary target	Primary intervention			
	Behavioral	**Visual**	**Strategy**	**Multicomponent**
Listening			de la Iglesia, J.C.F., Buceta, J.M., & Campos, A. (2005). Prose learning in children and adults with Down syndrome: The use of visual and mental image strategies to improve recall. *Journal of Intellectual and Developmental Disability*, *30*(4), 199–206.	
Multiple literacy targets				Cohen, D., Plaza, M., Perez-Diaz, F., Lanthier, O., Chauvin, D., Hambourg, N., ... Rivière, J.P. (2006). Individual cognitive training of reading disability improves word identification and sentence comprehension in adults with mild mental retardation. *Research in Developmental Disabilities*, *27*(5), 501–516. Gallaher, K.M., van Kraayenoord, C.E., Jobling, A., & Moni, K.B. (2002). Reading with Abby: A case study of individual tutoring with a young adult with Down syndrome. *Down Syndrome Research and Practice*, *8*(2), 59–66. Gordon Pershey, M., & Gilbert, T.W. (2002). Christine: A case study of literacy acquisition by an adult with developmental disabilities. *Mental Retardation*, *40*(3), 219–234.

words. Pairs who learned more words through direct instruction also learned more words incidentally, and pairs who acquired few new words from direct instruction acquired few words incidentally.

Lalli and Browder (1993) first compared the effects of four interventions on the sight word acquisition of adults with developmental delays. The researchers compared time delay, outlining words with a red color and gradually fading the outline, asking participants to select a target word from a list that included distractor words, with a feedback-only condition. Participants performed similarly in all conditions, so the researchers next taught participants novel words in the context of their local grocery stores and group homes using the feedback-only condition. All participants acquired new words in these contexts using the feedback-only procedure. Hua et al. (2013) compared the effects of time delay with a control condition, telling participants to pay attention while reading a passage, on vocabulary acquisition and reading comprehension of young adults with an autism spectrum disorder or ID in a postsecondary program. Tutors in the time delay condition taught three words per session. After two consecutive correct trials on each word, the tutor asked the participant to read an expository passage that included the taught words aloud and answer 10 reading comprehension questions. All participants acquired and retained more vocabulary words in the time delay condition as compared with words acquired in the control condition. There was no advantage for either condition on reading comprehension performance.

Three other studies also employed behaviorally based instruction to teach word recognition. Stewart, Hayashi, and Saunders (2010) examined the effect of teaching medial vowel discrimination in consonant-vowel-consonant words using computerized instruction and carefully selected stimulus control procedures. This was the only word recognition study that explicitly taught phonics skills. The participant, an adult with ID, saw the word on a computer screen and heard it spoken. He next selected letters to spell the word from a pool of letters on the screen. Researchers taught six words in four word family groups and then taught all five vowels within a single session across 12 different consonant-vowel-consonant word sets with the same final consonant (/p/). Teaching word families resulted in increased accuracy on word sets taught immediately prior to testing and decreased accuracy on sets trained more distantly. Teaching all five vowels in the same session resulted in increased accuracy on all word family words regardless of when they were trained.

Stromer, Mackay, Howell, McVay, and Flusser (1996) examined the effect of computerized spelling instruction based on behavioral principles on generalization to handwritten spelling of words and practical use of handwritten lists with two adults with ID and profound hearing loss. Participants acquired spelling words on both the computerized tasks and the pencil-and-paper tasks, but object retrieval scores were consistently higher when the participants used handwritten lists.

Worsdell et al. (2005) examined the effects of three types of error correction strategies derived from behavioral instruction on learning sight words. They found that asking participants to repeat the correct word five times after errors and doing so after every error versus every third error resulted in mastery and retention of more words. Repeating missed target words five times after each error versus repeating a nontarget word five times was also associated with positive effects for most participants.

Visuals. Researchers in three studies specifically examined whether pairing visuals, such as pictures or symbols, with text helped adults learn literacy skills. Hill (1995) compared sight word acquisition across three conditions between adults with Down syndrome and adults with ID of unspecified etiology. She paired black-and-white or colored pictures with printed three- and four-letter sight words and, using a five-second time delay, compared sight word acquisition in these conditions with a condition in which only the printed word was taught. She found that although pictures enhanced word identification in training sessions, they did not significantly improve the correct identification of words in the testing phase when all pictures were removed.

Jones, Long, and Finlay (2007) also used visuals as a primary intervention. They examined whether adding Widgit Rebus symbols to written text would improve adults' comprehension of text. Participants read texts written at their independent reading level, with and without symbols, and answered comprehension questions. Participants correctly answered significantly more comprehension questions after reading text with symbols than without. Participants with lower reading levels benefited more from using symbolized text than those with higher skill levels.

De la Iglesia, Buceta, and Campos (2005) compared the effect of three conditions on participants' listening comprehension. In condition 1, participants were told to listen carefully to a story. In condition 2, colored pictures accompanied the major elements of the story as it was read aloud. In condition 3, researchers told participants to create mental images before they listened to a

story. Results showed significant positive differences in immediate and delayed recall of both words and ideas in the picture condition.

Strategy-Based Interventions. Four groups of researchers taught participants one or more comprehension strategies to improve literacy skills. Hua, Hendrickson, et al. (2012) and Hua, Therrien, et al. (2012) studied a repeated reading intervention, Reread-Adapt and Answer-Comprehend (RAAC), that had previously been found effective in improving reading comprehension of children with disabilities. In the first study (Hua, Hendrickson, et al., 2012), the researchers taught two young adults with ID enrolled in a postsecondary program to use the RAAC strategy and examined changes in their reading fluency and factual and inferential reading comprehension. Participants' fluency (correct words per minute) increased immediately following the RAAC intervention, as did their accuracy in answering factual and inferential comprehension questions. Hua, Therrien, et al. (2012) sought to replicate these earlier findings with a group of young adults with autism and ID. Similarly, the researchers found that the RAAC intervention improved the participants' fluency, decreased reading errors, and was associated with some gains in comprehension.

Van den Bos, Nakken, Nicolay, and van Houten (2007) taught adults with ID to apply four reading comprehension strategies to texts: summarizing, questioning, clarifying, and predicting. The researchers randomly assigned participants to one of three groups. Group 1 received direct instruction on the strategies in a one-to-one format, and group 2 received direct instruction combined with elements of reciprocal teaching in a small-group format. Group 3 was a control group. Results showed no significant differences on strategy performance between the small group versus the individual instruction conditions; participants in both groups significantly increased use of strategies after the intervention and showed significant transfer of comprehension skills to standardized measures of reading comprehension, particularly for expository text. Improved comprehension skills maintained across three months.

Morgan, Moni, and Jobling (2004) taught a young adult with Down syndrome to use three strategies to improve reading comprehension: use of question words, prediction, and retelling. After 15 weeks of small-group instruction, the participant required less prompting to use the strategies and demonstrated increased reading accuracy, fluency, and comprehension on standardized measures.

Multiple-Component Interventions. Researchers in three studies examined the efficacy of interventions that taught multiple literacy skills in an integrated manner. Cohen and colleagues (2006) applied what they termed "reading therapy" to adults with ID. It entailed instruction in phonological awareness, word identification, syntax rules, and text and narrative reading comprehension. Twenty participants received 60 biweekly individual instructional sessions administered by a reading specialist based on assessment of their skills using a battery of reading tests. Researchers placed another 32 individuals into a comparison group. There was significant improvement in the experimental group's performance on word identification in oral production and silent reading and comprehension at the sentence level postintervention. There was no significant improvement in their narrative comprehension scores.

Gallaher, van Kraayenoord, Jobling, and Moni (2002) examined the effects of an intervention that entailed building phonological awareness and phonics knowledge, increasing sight word vocabulary, developing understanding of text structure, and improving the ability to compose text on the literacy skills of a young woman with Down syndrome. She received 12 weekly individual intervention sessions in addition to attending a group literacy class two times per week. Session content focused on her interests and used highly motivating computer-based tasks. Postintervention testing revealed improved discrimination of beginning sounds, acquisition of nine sight words, improved concepts about print, and increased confidence toward literacy tasks.

Gordon Pershey and Gilbert (2002) examined outcomes for a woman with ID of an intervention that included using the Laubach reading system with unison and echo reading; sight word instruction; and writing instruction with language experience stories, writing from dictation, using invented spelling, and copying from a model. She improved in word recognition, writing and spelling, and comprehension at the word level and increased use of literacy in both personal and employment settings.

Summary

Table 1 shows an increasing trend since 2000 away from interventions based exclusively on behavioral strategies toward those derived from reading instruction for typically developing individuals, such as strategy instruction. The targets examined in the reviewed studies also showed a trend across time away from a sole focus on sight words to more attention to text-level comprehension and acquiring multiple literacy skills within

integrated instruction. This is not an absolute trend (cf. Dogoe et al., 2011) but may reflect a more positive view of the learning potential of individuals with extensive support needs—that is, that these adults are capable of acquiring more complex skills and doing so with interventions used for their typical adult peers.

Implications for Practice and Future Research

All of the reviewed studies documented that participants improved their literacy skills across widely varying interventions, demonstrating that individuals with extensive support needs can acquire new literacy skills well into adulthood. These findings support claims of researchers and practitioners who have long advocated that literacy instruction for this group should continue beyond formal schooling age (e.g., Moni et al., 2011). Next, we highlight some of the central implications of these studies.

Teach for Comprehension

Comprehension is the purpose of reading, so it is encouraging that over half of the studies reviewed focused on teaching reading comprehension and vocabulary knowledge instead of focusing solely on word recognition, as has been seen in prior research with children and youths with severe disabilities (Browder et al., 2006). Most of these studies took place since 2000, suggesting increasing awareness of the importance of teaching for meaning.

Language and short-term memory challenges make comprehension difficult for many adults with extensive support needs. Teaching for comprehension from the beginning of word recognition instruction and using instructional materials based on adults' interests are likely to both increase engagement and meaning making and facilitate comprehension (see, e.g., Gallaher et al., 2002). Researchers found that pairing pictures with text improved reading and listening comprehension (but not word recognition). Strategies such as graphic organizers, which are effective for younger individuals with disabilities, might also support short-term memory but were not included in interventions in the reviewed studies.

Include Writing as a Component of Literacy Instruction

Researchers included writing, the ability to represent spoken language using symbols or text, as a primary or secondary target in only two studies (Gallaher et al., 2002; Gordon Pershey & Gilbert, 2002). Williams, Koppenhaver, and Wollak (2007) reported that writing instruction is not often provided to children with extensive support needs. This review documents that this seems to also be the case for adults.

Failing to provide writing instruction is concerning because writing is an integral part of literacy. Learning how to communicate one's ideas, thoughts, and feelings to others in written (symbolic) form opens up a range of employment, social, recreational, and academic opportunities and can enhance communication in general (Koppenhaver & Williams, 2010). Denying this instruction to adults diminishes their opportunities for full participation in activities that most adults engage in every day, such as social media.

Teach for Transfer

The importance of teaching for generalization is another implication arising from this review. One of the learning characteristics of individuals with extensive support needs is difficulty with transferring knowledge learned in one context to another setting or task. These learners benefit when teaching is carefully and explicitly structured to facilitate generalization. Despite this well-documented learning need, few researchers have examined participants' ability to transfer the literacy skills that they acquired in the intervention setting to the use of literacy in their day-to-day lives. Adult learners in general do better when they can recognize and make connections between skills that they are learning and ways that these skills apply to their lives. Rachal (1989) noted that "adult education, even more so than childhood and adolescent education, has a direct and symbolic relationship with the environment in which it occurs" (p. 3). Darvin (2006) suggested that it is critical when working with older learners who are reluctant readers and writers to situate instruction within authentic contexts that the learner chooses. Thus, it seems particularly important that adults with extensive support needs should receive literacy instruction that is clearly linked to their interests and everyday lives. This might improve generalization of skills and increase their motivation to persist in learning.

Preparation of Literacy Instructors

The researchers in these studies served as the interventionists except in the studies by Hua and colleagues (Hua, Hendrickson, et al., 2012; Hua, Therrien, et al., 2012b; Hua et al., 2013), who trained undergraduate student tutors to teach study participants. Given this, it

is not clear whether instructors in typical adult habilitation or education settings could effectively implement the interventions used. Research on preparing teachers to provide literacy instruction to children with extensive support needs has shown that limited knowledge of how to teach literacy skills to these students negatively affects the type and quality of instruction provided (Copeland et al., 2011). Future research should investigate the type and quality of training provided to literacy instructors of adults to ascertain how best to provide professional development in this area.

Limitations of Reviewed Studies

Few researchers included data on participants' adaptive functioning or learning characteristics, making it difficult to determine what participants' specific support needs were. Disability labels or even IQ scores do not provide sufficient information to determine the level and extent of supports required (AAIDD Ad Hoc Committee on Terminology and Classification, 2010). Including more detailed descriptions of participants' learning characteristics in future studies would aid in determining which types of interventions are most effective with which groups of learners.

None of the reviewed articles appeared to use a conceptual framework of adult learning to guide intervention design or interpret results. Future research designs should be informed by what we know about adult learning while taking into account the learning characteristics of individuals with extensive support needs.

Conclusions

The findings of this review substantiate that adults with extensive support needs can acquire and develop literacy knowledge across adulthood. That said, much more must be learned about how to structure literacy education in ways that are efficient, effective, and motivating. There is a lack of research examining transfer of skills learned in intervention settings to adults' daily lives. It seems evident that children and adults may be motivated to learn in different ways (see, e.g., Darvin, 2006). Adults benefit from many of the same instructional strategies that have been shown to be effective with children. However, it is important to take their interests, their prior life experiences, and the ways in which they want to use literacy in their daily lives into consideration when designing instruction (Merriam, 2001). Doing so may increase motivation and persistence and thus positively impact literacy outcomes.

TAKE ACTION!

1. Communicate high expectations for adults with extensive support needs by making literacy learning opportunities a priority. Partner with local universities and other community agencies that can train staff who work with this population to implement effective literacy learning strategies in the context of adult services, such as community work programs or postsecondary settings.
2. Motivation is essential. Adults with extensive support needs should have the opportunity to set personal goals that ensure that their reasons for continued learning are meaningfully embedded within their literacy learning activities.
3. Build curricula, services, and supports around adults' goals. Focus on teaching for meaning and transfer to create authentic, engaging instruction. Use systematic instruction to teach new skills, but do so within integrated skill instruction that includes each aspect of literacy within lessons.
4. Use strategies known to improve literacy learning outcomes of children with extensive support needs (e.g., graphic organizers, accessible texts, applying skills in context, multimodal instruction), and situate them within real-world activities that include opportunities to problem solve to maximize their relevance and impact for adult learners.

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