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Handwriting in the Schools: Challenges and Solutions

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Handwriting is the key way through which elementary students convey their thoughts and ideas about what they have learned with their peers and teachers (Case-Smith, 2002; Hammerschmidt & Sudsawad, 2004; Woodward & Swinth, 2002). Graham and Harris (2005) supported this view, noting that handwriting is the primary means by which students demonstrate their knowledge in school, but even more important, it provides a flexible tool for gathering, remembering, and sharing knowledge as well as an instrument for helping children to explore, organize, and refine their ideas about a specific subject. According to McHale and Cermak (1992), from 31% to 60% of a student's academic day is consumed by many types of fine motor tasks, such as handwriting.

Writing difficulties have been documented in children with and without disabilities (Nelson, Benner, Lane, & Smith, 2004; Persky, Daane, & Yin, 2003). In addition to the fine motor facets of handwriting are social implications. For example, handwriting performance can affect self-esteem, hand-eye coordination, visuomotor integration, academic success, school behavior, and in-hand manipulation (Cornhill & Case-Smith, 1996; Feder, Majnemer, & Synnes, 2000; Graham, Harris, & Fink, 2000). Barnes, Beck, Vogel, Grice, and Murphy (2003) surveyed 224 school-based occupational therapists who worked with students experiencing emotional disturbances. They discovered that 91.5% of the therapists reported handwriting as the most frequently analyzed performance area addressed. Writing difficulties also can impede learning as poor handwriting interferes with the thought process during composition because the child often is concentrating on mechanical performance (Graham et al., 2000).

Teacher referrals to occupational therapy for handwriting problems are among the most prevalent in public schools (Reisman, 1991). According to Hammerschmidt and Sudsawad (2004), collaboration between teachers and occupational therapists is imperative because the teachers are the "primary source of handwriting instruction" (p. 186). Although the teacher's responsibility is to teach handwriting, occupational therapists possess the knowledge to assist in refining those skills.

Occupational therapists have divergent perspectives regarding the optimal approach to adopt for addressing handwriting. One viewpoint suggests that handwriting is a complex motor skill

requiring many components, such as visual-motor coordination, cognitive and perceptual skills, and tactile and kinesthetic sensitivities (Feder et al., 2000). Many occupational therapists subscribe to a sensorimotor-based approach that assumes that the underlying capacities must be addressed before handwriting performance will improve (Feder et al., 2000). Another perspective supports the practice of handwriting using skillfully designed motor-learning strategies in order to increase handwriting performance (Denton, Cope, & Moser, 2006). All perspectives have their merits; however, the reality is that therapists often use a combination of these frames of reference along with others as a guide in intervention planning.

This article summarizes current information regarding practice patterns of occupational therapy handwriting interventions in the schools and discusses various challenges and possible solutions related to treating students' handwriting difficulties in schools. This information is based on a review of existing literature and the findings of a 2006 focus group of school-based therapists in southeastern Wisconsin (Dague, Judkins, Minten, Vick, & Cope, 2006).

Assessments

Occupational therapists use a variety of assessments to analyze the handwriting abilities of children, including the Beery-Buktenica Developmental Test of Visual-Motor Integration (Beery, 1997), the Bruininks-Oseretsky Test of Motor Proficiency (Bruininks, 1978), Gardner Test of Visual Perceptual Skills-Motor (Gardner, 1996), and the Evaluation Tool of Children's Handwriting (Amundsen, 1995). Although other assessments are used (see Appendix A), there does not seem to be a consensus by therapists on their use (Dague et al., 2006; Feder et al., 2000).

Interventions

In a telephone survey of 50 Canadian occupational therapists, Feder et al. (2000) found that an eclectic intervention approach was favored to address handwriting difficulties. Ninety percent of the Canadian therapists used a sensorimotor approach followed by perceptual-motor and motor-learning approaches. The majority reported meeting with students once a week (56%), with 12% indicating intervention more than once a week and 8% providing biweekly treatment. The common point of view on duration of service delivery was 3 to 4 months.

Woodward and Swinth (2002) found in a national survey that 90% ($n = 198$) of U.S. occupational therapists used a multisensory approach to treat handwriting issues. The most common modalities used were chalk and chalk board; markers; verbal description of letter shapes while the student writes; shaving cream for finger writing; and copying and tracing letters on regular lined, colored, or embossed lined paper.

Through their focus group of school-based therapists, Dague et al. (2006) also identified use of an eclectic approach to provide handwriting intervention. The most common intervention was a sensorimotor approach paired with other interventions. The average intervention duration time was one to two times a week for 30 to 60 minutes a session throughout the entire school year. The most commonly used commercial intervention was Handwriting Without Tears® (www.hwtears.com).

A recent systematic review of occupational therapy handwriting interventions revealed that handwriting is an area that can improve with intervention (Payne & Cope, 2004). However, no one method for improving handwriting clearly outperforms the others. It is essential that additional studies be completed to determine whether sensorimotor-based, motor learning, or eclectic interventions are the most effective for improving handwriting performance in school-aged children.

Challenges

Treating handwriting issues in the schools provides many unique challenges. Often, therapists receive referrals for children who do not have an individualized education program (IEP) and, therefore, do not qualify for occupational therapy services in schools under the Individuals with Disabilities Education Act of 2004 (Public Law 108-446). In Denton, Cope, and Moser (2006), 25% of the 200 children with typical development studied scored at least 1.5 standard deviations below the norm for their age on the Test of Handwriting Skills (Gardner, 1998). This finding suggests that many children with no identified exceptional educational needs still have handwriting difficulties that need to be addressed. Increasingly, occupational therapists, in collaboration with teachers, are developing and implementing teaching strategies to address handwriting under the Response to Intervention (RtI) model. RtI holds much promise for occupational therapists in the schools to be involved in preventative activities for children. See www.nasdse.org/Projects/ResponsetoInterventionRtIProject.

A second challenge in the treatment of children with handwriting difficulties is the complex multifactorial nature of handwriting problems. A lengthy and diverse list of explanations is cited in the literature and through unpublished focus group data that propose

why children have handwriting difficulties (see Appendix B). The sheer number of possibilities is a challenge to a therapist because each may need to be explored in order to help the child.

School-based occupational therapists receiving handwriting referrals have their own challenges. Leading the list is the limited amount of published research and evidence-based guidance on effective interventions. An eclectic approach tends to be the most commonly used method and can be customized according to each child's age and unique needs (Dague et al., 2006; Denton et al., 2006; Feder et al., 2000). Unfortunately, little research is published on the eclectic method, with sparse evidence on its effectiveness. Occupational therapists use numerous preparatory techniques in an attempt to address the underlying impairments that can affect handwriting (Dague et al., 2006). Handwriting practice rarely is used as a solitary intervention and often is left for the child to do in class and at home. This area is challenging because of the lack of knowledge regarding best practice and which intervention leads to the best possible handwriting outcome.

A final challenge for school-based occupational therapists is the inconsistent and increasing lack of attention within the educational environment to formal handwriting instruction. For instance, some school districts have specific handwriting curricula, whereas others have none. No consistent time frames exist as to when children should begin handwriting and when they should change from manuscript to cursive writing. Most curricula do not allow for individualized time with each student; instead, all students are expected to move forward at the same pace and at the same time. This approach is not effective because the skill level of each child varies, and the child's preferred style of learning is not considered.

Possible Solutions

These challenges cannot be resolved with a single solution. The foundation for any solution is to work within the educational system. One way to do this is to collaborate with the administration to establish a task force focusing on refining the handwriting curriculum used at the school—if any—and to brainstorm and create a district-wide service delivery model to teach handwriting properly. A school-based occupational therapist in Wisconsin found this method to be effective. She assembled a committee of principals, teachers from each grade level, occupational therapists, special education teachers, and curriculum directors. The committee met every other month to review different curricula used, teaching styles, and remediation strategies. The primary objectives of the task force were to determine best practice regarding handwriting instruction and generate a single handwriting curriculum to be used by all professionals associated with teaching handwriting. This strategy can help to address both the referral and curriculum challenges discussed earlier and provide a common approach for teaching handwriting.

Another solution is to offer an after-school handwriting club where handwriting practice is monitored and regulated. According to Denton et al. (2006), practice is the most effective method in improving handwriting performance. A free 45-minute class led by an occupational therapist or a trained teacher could meet two to three times a week to incorporate at least 30 minutes of individualized handwriting practice, especially to students with handwriting difficulties within the general education population. The therapist or teacher could develop specific goals that allow both the child and the therapist to recognize improvement in handwriting.

A third solution involves educating non-occupational therapy personnel on handwriting intervention concepts and theories through in-services. Topics could include how to hold a pencil, use of pencil grips, use of lined paper, body mechanics, and sensory-based approaches for improving attention span (e.g., weighted

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vests, brushing). Providing this information to other professionals may decrease some of the referrals as well as arm teachers with the knowledge to address some handwriting issues independently without the need to first discuss the situation with an occupational therapist. This solution could go a long way in alleviating a backlog of referrals. Armed with a toolbox of strategies, other professionals can begin to help children who are struggling with their handwriting who previously would have been referred to occupational therapy.

Finally, a solution for improving the service delivery for handwriting issues calls for more research. Additional research is needed to compare interventions, determine long-term effects, compare theoretical approaches, and determine which children benefit the most from which handwriting intervention. The ideal study would be a well-thought-out design with large sample sizes; unfortunately, most practitioners do not have the time or resources to complete these types of studies. As an alternative, therapists could conduct single-subject research, case studies, or case reports to generate outcomes data geared to better understanding which factors are most related to handwriting and which interventions are most effective in the remediation of handwriting challenges for particular children. This alternative could help to overcome the challenge of inadequate research regarding intervention methods.

Conclusion

It is not a surprise that school-based occupational therapy practitioners face a variety of challenges with regard to addressing handwriting problems. Therapists are seeing an increase in handwriting referrals because of differences in curriculum, teaching styles, and the complex multifactorial nature of handwriting development in children. Although no easy answers exist, this article provides some possible solutions that can help to overcome these challenges as well as increase the effectiveness of teaching handwriting to children. Any solution requires that therapists take the lead in studying the issues on the wide variety of interventions and adaptations available to both children and teachers to improve handwriting. Without question, occupational therapy can play an integral role in the future of handwriting intervention in schools. ■

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Appendix A

Assessments Used To Analyze Handwriting Abilities

- Beery-Buktenica Developmental Test of Visual-Motor Integration (Beery, 1997)
- Bruininks-Oseretsky Test of Motor Proficiency (Bruininks, 1978)
- Gardner Test of Visual Perceptual Skills-Motor (Gardner, 1996)
- Evaluation Tool of Children's Handwriting (Amundsen, 1995)
- Developmental Test of Visual Perception-2 (Hammill, Pearson, Voress, & Frostig, 1993)
- Handwriting Without Tears (<http://www.hwtears.com/>)
- School Function Assessment (Coster, Deeney, Haltiwanger, & Haley, 1998)
- Peabody Developmental Motor Scales (Folio & Fewell, 2000)
- Shore Handwriting Screening (<http://www.shorehandwriting.com/>)
- Wide Range Assessment of Visual Motor Abilities (Adams & Sheslow, 1995)
- Degangi-Berk Test of Sensory Integration (Berk & Degangi, 1983)
- Observation

Appendix B

Reasons for Handwriting Difficulties in Children

- Lack of readiness
- Prehension problems
- Impaired in-hand manipulation
- Multi-tasking issues
- Lack of floor time with manipulatives
- Poor motor planning
- Cognitive issues
- Lack of focus and distractibility
- Decreased strength
- Visual-perceptual problems
- Proprioception issues
- Sensory deficits (tactile)
- Postural problems
- Vestibular issues
- Differences in academic teaching
- Late language exposure
- Early habits that are hard to change

(Source: Case-Smith, 2002; Dague et al., 2006; Feder et al., 2000; Woodward & Swinth, 2002)

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