Understanding Dysgraphia: An Educator's Perspective

Laurel J. Stillman
Montana State University-Billings

Abstract

Writing is developed over many years. The complexity of writing makes it difficult for many students. Some students may demonstrate characteristics of a writing dysfunction called dysgraphia. In schools, dysgraphia is considered a learning disability as writing is a necessary foundation for learning tasks. There are many signs of dysgraphia that educators should be able to recognize. Early detection and intervention are key to helping students gain academic success. Educators need to understand the characteristics of dysgraphia, typical stages of writing, and writing interventions to support students with dysgraphia.

Keywords: dysgraphia, educators, intervention

Learning to write is a complex task. It is necessary to discern between two key terms: handwriting is the mechanical skill of writing, and writing refers to the ability to produce written content (Hen-Herbst & Rosenblum, 2018). Developing handwriting skills typically comes before or in conjunction with higher-order writing skills. In primary schools, focus starts with letter writing before constructing written sentences. However, the two skills are directly related and work jointly as students are required to construct legible, organized, high-quality content in a reasonable amount of time (Hen-Herbst & Rosenblum, 2018). While most students develop the skills needed for writing successfully, others have substantial difficulty with this task. These students may have a learning disability called dysgraphia. While teacher education courses may include handwriting instruction methods, many educators are not familiar with the characteristics of writing dysfunction. As a result, students with dysgraphia may not receive appropriate need-based instruction. By examining the elements of writing in order to understand dysgraphia, educators can implement targeted writing intervention strategies to encourage success for all students.

Defining Dysgraphia

Dysgraphia is a neuro-developmental disease and is considered a specific learning disability (Hen-Herbst & Rosenblum, 2018). Although there are not specific diagnostic criteria, students with dysgraphia often display certain characteristics in written expression (Hen-Herbst & Rosenblum, 2018). Dysgraphia can be developmental or acquired (O'Hare, 2004). Children with Attention Deficit and Hyperactivity Disorder (ADHD), dyslexia, and other executive function issues are at a higher risk of having dysgraphia (Hen-Herbst & Rosenblum, 2018). Students are more likely to have dysgraphia if they have developmental coordination disabilities, including visual-motor disabilities, difficulty with motor planning, and tactile or kinesthetic

sensitivities (Feder & Majnemer, 2007). However, students may demonstrate dysgraphia without other disabilities or disorders (Crouch & Jakubecy, 2007; Hanley & Sotiropoulos, 2018). Educators should be familiar with the attributes associated with dysgraphia.

Students may exhibit any number of dysgraphia's varied characteristics (Crouch & Jakubecy, 2007). Several studies cite inefficient speed, excessive errors, and illegibility of handwriting as primary distinctions for students with dysgraphia; however, there are many more symptoms and signs demonstrated by students with dysgraphia (see Appendix A) (Crouch & Jakubecy, 2007; Feder & Majnemer, 2007; Hen-Herbst & Rosenblum, 2018). If there is a trend of illegible writing, educators should question if a student has dysgraphia (Crouch & Jakubecy, 2007).

If dysgraphia is suspected, teachers and the student should evaluate the parts of the writing process that are most difficult for the child (Hen-Herbst & Rosenblum, 2019). The gathered data allows educators to categorize the displayed attributes into one (or more) of the four subtypes of dyslexia. The first type, phonological dysgraphia, is related to phonetic spelling of irregular and unfamiliar words (Crouch & Jakubecy, 2007). Students with phonological dysgraphia have difficulty spelling by sound and will perform poorly on tasks such as spelling tests and sentence dictations (Crouch & Jakubecy, 2007). Reluctant writers are likely to stop sentence and story composition when encountering a word that cannot be easily spelled.

The second type is surface dysgraphia (Crouch & Jakubecy, 2007). Surface dysgraphia is represented by the overuse of orthographic representations of sounds (Crouch & Jakubecy, 2007). Students may rely on memorized sound patterns and word families (Crouch & Jakubecy, 2007). A study by Hanley and Sotiropoulos (2018) showed the poor spelling characteristics of surface dysgraphia to be evident in languages with no irregularly spelled words and in language

systems where irregular words are more common. “Reading and spelling words in alphabetic writing systems are the same regardless of whether the orthography is transparent or opaque” (Hanley & Sotiropoulos, 2018, p.340). Surface dysgraphia can be considered the opposite of phonological dysgraphia (Crouch & Jakubecy, 2007).

Mixed dysgraphia is the third subtype and includes characteristics of phonological and surface dysgraphia (Crouch & Jakubecy, 2007). Mixed dysgraphia is represented by mixing up letter formations and difficulty in spelling (Crouch & Jakubecy, 2007). The rules and directions of letter formation become confusing and result in inconsistent spelling (Crouch & Jakubecy, 2007). The last subtype is semantic/syntactic dysgraphia. Semantic/syntactic dysgraphia is demonstrated through grammatical errors as students link words in comprehensive phrases (Crouch & Jakubecy, 2007).

Characteristics and subtypes of dysgraphia can be hard to recognize in primary grades as students are learning and developing skills (O’Hare,2007). Though the acquisition of writing follows a predictable pattern, the rate of student progress may vary significantly (O’Hare, 2004). Writing is a complex task, combining the fine-motor control of penmanship with spelling and written language; predicting long term difficulties in developing these skills is a challenge for educators (O’Hare, 2004). “Consequently, most children with dysgraphia are identified only after a number of years of failing in the education system” (O’Hare, 2007, p. 651). Educators must recognize the characteristics of dysgraphia in relation to the stages of handwriting development to allow for the necessary early detection and support of students with dysgraphia.

Stages of Writing

Handwriting begins to develop as scribbling and becomes more intentional and controlled over time (Feder & Majnemer, 2007). Children as young as two years old start to make marks

that resemble shapes and letters (Feder & Majnemer, 2007). Strokes typically emerge as vertical lines, progressing into horizontal lines and circles within a year; the ability to copy a cross, square, and triangle indicate writing readiness, usually when a child is approximately 5 years of age (Feder & Majnemer, 2007). Students are expected to develop handwriting and content writing quickly during first grade, mastering letter formations and relating simple sentences to form narratives and expository texts. While handwriting tends to plateau by age 8 (Feder & Majnemer, 2007), content writing continues to evolve. After attainment of letter formation, handwriting should become automatic, and cognitive capacity can then be devoted to higher-order thinking skills (Crouch & Jakubecy, 2007). When necessary, handwriting skills should continue to be fine-tuned through teacher instruction regardless of student's grade or content level.

Throughout the stages of handwriting, attention needs to be given to students' pencil grip and paper slant (Crouch & Jakubecy, 2007; Feder & Majnemer 2007). Consistent letter formations, misuse of lines, and general illegibility are some characteristics of poor pencil grip (Crouch & Jakubecy, 2007). Students may need instructional guidance with positioning of a pencil to ensure a proper grasp (Feder & Majnemer, 2007). Efficient writers place fingers about 1 inch from the tip of the pencil using a pincer grip (Crouch & Jakubecy, 2007). The pencil is held at a 45-degree angle from the paper (Crouch & Jakubecy, 2007). Writing pressure should be moderate (Crouch & Jakubecy, 2007): heavy enough for students to create smooth, clearly-visible lines, yet not so hard that the student's small motor muscles tire rapidly. A child experiencing motor fatigue will have a decreased automaticity affecting the natural rhythm of handwriting (Crouch & Jakubecy, 2007; Fender & Majnemer, 2007). The paper used for writing

should be tilted away from the hand being used for writing so that wrist and arm can maintain a more natural, comfortable position.

Research shows that children from disadvantaged backgrounds may demonstrate lower levels of motor sequencing tasks when they enter primary school and begin formal handwriting instruction (O'Hare, 2004). This gap can be remedied through targeted interventions as it is likely these students have not had the experiences needed to obtain the next developmental level. Throughout primary school, females are likely to demonstrate a higher quality and faster rate of writing when compared to male peers (Feder & Majnemer, 2007; O'Hare, 2004). All students will have more opportunity to meet their potential if instruction is within their zone of proximal development.

Intervention Strategies

Studies have indicated that writing difficulties created by dysgraphia do not improve simply with student maturation (Hen-Herbst & Rosenblum, 2018). By understanding the characteristics and subtypes of dysgraphia, educators can use the collected data and student reports to implement targeted intervention strategies. The instructional approach should be aligned to the needs of the student (Feder & Majnemer, 2007). Progress monitoring should occur during and after intervention (Feder & Majnemer, 2007) and will provide educators with information for the next step. Educators should be aware of the strengths and limitations of the evaluation tools they choose to use (Feder & Majnemer, 2007). Crouch and Jakubecy (2007) suggest there are two approaches to dysgraphia intervention: remedial treatment and by-pass strategies.

Remedial treatments intend to use systematic techniques of direct instruction to help students make writing corrections (Crouch & Jakubecy, 2007). Students show the most

improvement when explicit demonstrations are provided (O'Hare, 2004). Though there is not a standardized method of teaching handwriting in primary grades, research shows "supplementary handwriting instruction can improve accuracy and fluency of handwriting performance...despite varying duration, frequency, and treatment approaches applied" (Feder & Majnemer, 2007, p. 315). Studies indicate handwriting remediation increases legibility, but the rate of writing did not increase (Feder & Majnemer, 2007).

Increasing fluency may be possible with sonification, linking sound with pencil movements (Danna et al., 2015). Slow or rapid, haphazard writing indicates a difficulty coordinating the timing of the rhythmic motions of handwriting (Feder & Majnemer, 2007). Sonification studies conducted by Danna et al. (2015) indicate that linking sounds to the handwriting movements could "provide real-time auditory feedback to children, helping them to perceive incorrect movements" (p. 10). While the instruments and techniques utilized in this study are not available in the classroom setting, educators can use a similar principle of using songs and sound in teaching letter formation. Handwriting curriculums often include supplemental materials intended to be used in this way. As readability of handwriting improves, interventions should address cognitive and linguistic skills (Feder & Majnemer, 2007). In some cases, it may be appropriate to address both lower and higher-order skills simultaneously (Feder & Majnemer, 2007).

Building fine motor skills is another proven remedial treatment (Crouch & Jakubecy, 2007). Tasks that strengthen the hand muscles improve pencil grasp and position (Crouch & Jakubecy, 2007). A student's ability to control the hand when writing can also increase with small motor development (Crouch, & Jakubecy 2007; Feder & Majnemer, 2007). Legos, play-dough, and stringing beads are examples of engaging yet effective activities (Crouch &

Jakubecy, 2007). Even with these interventions, some students will continue to display dysgraphia; however, no students displaying difficulties will obtain success in writing without intervention (Feder & Majnemer, 2007).

By-pass strategies use alternative means to work around the student's displayed aspects of dysgraphia (Crouch & Jakubecy, 2007). Technology provides assistive devices, such as talk-to-text programs, that remove the physical act of writing from academic activities (Crouch & Jakubecy, 2007). Other compensatory strategies may include modification of student assignments or assistance from an instructional aide. While by-pass strategies may alleviate a student's school stress, the undesired dysgraphia characteristics are not corrected, and students are likely to have difficulties writing in life-skills activities.

Conclusion

It has been estimated that handwriting dysfunction occurs in 10-30% of children (Feder & Majnemer, 2007). If an educator works for 5 years in a regular education classroom teaching 20 students per year, it is reasonable that up to 30 of the children under that teacher's instruction have demonstrated signs of dysgraphia. It is likely that most of these students are never suspected to have a learning disability. Students may instead be labeled as non-compliant or unmotivated (Feder & Majnemer, 2007). Because of this misinterpretation, students are not properly diagnosed, and adequate writing interventions are not put into place. With a deeper understanding of the development of writing and subtypes of dyslexia, educators can better assess difficulties and provide the support students need and deserve. High-quality writing is the foundation of academic success; to obtain the latter, educators must foster the first.

Appendix A

Characteristics of Dysgraphia

- Cramped fingers on writing tool
- Odd wrist, body, and paper positions
- Excessive erasures
- Mix of upper- and lowercase letters
- Mixture of print and cursive letters
- Inconsistent letter formations and slant
- Irregular letter sizes and shapes
- Unfinished cursive letters
- Misuse of line and margin
- Poor organization on the page
- Inefficient speed in coping
- Decreased speed of writing
- General illegibility
- Inattentiveness about details when writing
- Frequent need of verbal cues and use of sub-vocalizing
- Heavy reliance on vision to monitor what the hand is doing during writing
- Slow implementation of verbal directions that improve sequencing and planning

(Crouch & Jakubecy, 2007, para.5)

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