

How Do Primary Grade Teachers Teach Handwriting?

A National Survey

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For adults, the act of handwriting is mostly an unconscious, automatic task (Willingham, 1998). For beginning writers, however, handwriting is a more effortful activity, as the processes for producing letters still require conscious attention (Berninger, 1999; Graham, 1999). Until this skill becomes efficient and relatively automatic, it may exact a toll on the writer and ultimately writing development.

Handwriting may constrain beginning writers in at least four ways. One, these children's written text may be less accessible to others, because the legibility of their handwriting is still developing (Graham, 1999). Two, what they say in their writing may be devalued to some degree, as legibility of text can influence the evaluation of writing content. For example, when adults are asked to evaluate two or more versions of a paper differing only in handwriting legibility, lower marks for overall quality of ideas are assigned to papers that are less legible (Marshall & Powers, 1969). Three, young children's handwriting may impede their writing efforts by interfering with other writing processes (Scardamalia, Bereiter, & Goleman, 1982). For instance, having to switch attention during composing to thinking about how to form a particular

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letter may lead a child to forget writing ideas or plans being held in working memory. They are also likely to lose some writing ideas, as their handwriting is often not fast enough for them to record all of their ideas before they start forgetting some of them (Graham,

1990). Four, difficulties with handwriting may constrain young children's development as writers. McCutchen (1995) proposed that transcription skills such as handwriting are so demanding for beginning writers, that they minimize the use of other writing processes, such as planning and revising, because they exert considerable processing demands as well.

Moreover, Berninger, Mizokawa, and Bragg (1991) reported that difficulties with handwriting and spelling led children they worked with to avoid writing and develop a mind set that they could not write.

If handwriting plays an important role in shaping writing development, as the arguments above suggest, Graham and Harris (2000) argued that it is reasonable to expect that: (1) the handwriting of more skilled writers is superior to that of less skilled writers, (2) students' handwriting improves with age and schooling, (3) individual differences in handwriting predict individual differences in writing, and (4) teaching handwriting improves the writing performance of developing writers. A recent review by Graham (2006) found that the available literature provides some support for each of these assumptions.

First, the handwriting skills of children with poor handwriting are less well developed than those of their normally developing counterparts. Their handwriting is not as smooth, accurate, or legible (see Graham & Weintraub, 1996). They are also more variable in their production of letter forms (Wann & Kardirkamanathan, 1991) and produce handwriting more slowly (Weintraub & Graham, 1998). Second, there is a considerable body of research showing that handwriting improves with age and schooling (see Graham & Weintraub, 1996). Although overall legibility may peak somewhere around fourth grade (Mojet, 1991), students continue to make modifications in how they produce letter forms (for example, they may simplify script by eliminating clockwise movements (see Bolte & Hanstra-Bletz, 1991), and their fluency with handwriting increases by about 10 letters or more per minute, before it starts to level off at the start of high school (Graham, Berninger, Weintraub, & Schaefer, 1998).

Third, individual differences in handwriting predict writing achievement. As part of a study examining the relationship between text transcription skills and writing performance, Graham, Berninger, Abbott, Abbott, and Whitaker (1997) reviewed 13 studies. They reported that handwriting fluency was moderately correlated with measures of writing achievement. In the empirical study they conducted, handwriting and spelling skills together accounted for a sizable proportion of the variance in the writing skills of 600 first through sixth grade children (up to 42% of the variance in writing quality and 66% of the variance in writing

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output). Of these two skills, only handwriting fluency continued to make a unique contribution beyond the primary grades in accounting for variability in how much and how well students wrote.

Fourth, even though the research base is relatively thin, teaching handwriting to young writers can improve writing performance. Three

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studies found that handwriting instruction not only improved young students' handwriting, but one or more aspects of their writing performance as well, including sentence construction skills, writing output, and writing quality (Berninger et al., 1997; Graham, Harris, & Fink, 2000; Jones & Christensen, 1999).

Despite the relative importance of handwriting, both theoretically and empirically, we know little about how it is taught to young, developing

writers. In contrast to spelling (see for example Brann & Hattie, 1995; Graham, Harris, MacArthur, & Fink-Chorzempa, 2003; Traynelis-Yurek & Strong, 1999), there have been few attempts to catalogue handwriting instructional practices in today's schools. There has been some speculation (Graham & Weintaub, 1996), especially by the media, (see for example Leo, 2002) that handwriting is not emphasized or taught to young developing writers. It is difficult to verify this assumption, as the

last published survey of handwriting practices was conducted in the early 1980s (Rubin & Henderson, 1982).

A recent study by Graham et al. (2003) provides some tentative evidence on this issue, however. They conducted a survey of the writing instructional practices of primary grade teachers randomly selected from throughout the United

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States. Although their study focused on the types of instructional adaptations teachers made for struggling writers, teachers were asked how often they taught handwriting skills to their students. Almost half of the

teachers reported teaching handwriting daily, with one fourth indicating that they provided instruction several times a week, and another 14% indicating they taught this skill weekly. Only about 2% of the teachers indicated that they did not teach handwriting at all.

Although these findings suggest that teachers of young children do value handwriting and teach it, additional research is needed to establish replicability and to more fully determine how handwriting is taught in today's schools. The current study addressed both of these points by surveying a randomly selected sample of primary grade teachers from throughout the United States and asking them if they taught handwriting, and if this was the case, how it was taught. Teachers were also asked to describe their students in terms of their handwriting skills, including their facility with handwriting legibility and fluency, number of students with handwriting difficulties, and types of handwriting problems. Teachers were further asked about how handwriting is learned and should be taught, why children experience handwriting difficulties, and the impact of handwriting difficulties. Finally, teachers were queried about whether they liked to teach handwriting and the amount of formal preparation on teaching handwriting they received in the teacher education courses taken in college.

Students' handwriting achievement is likely influenced by the amount of handwriting instruction provided in the classroom (i.e., more instructional time should lead to improved handwriting performance), which in turn is influenced by teachers' desire to teach this skill (i.e., teachers who enjoy teaching handwriting devote more time to its mastery by students), and these attitudes are likely shaped by teachers' competence (i.e., teachers with good handwriting and greater formal preparation in how to teach handwriting will be more positively disposed to teaching it). We tested this set of assumptions by examining if the prediction of handwriting achievement (as measured by teacher judgments of students' handwriting performance) was improved by adding measures of teacher attitude to indexes of teacher competence (i.e., prior teacher education preparation in handwriting instruction and quality of teachers' handwriting), and if this prediction was further improved by adding time devoted to teaching handwriting to this set of predictors. We examined the viability of this hierarchical model for two estimates of students' handwriting skills: legibility and fluency.

Students' handwriting achievement is likely influenced by the amount of handwriting instruction provided in the classroom.

Method

Subjects A stratified random sampling procedure was used to identify 249 first through third grade teachers from the population of primary grade teachers in the United States. The names were randomly selected from a list compiled by Market Data Retrieval so that there were an equal number of teachers in grades 1, 2, and 3. This registry contained the names of over 1,600,000 elementary school teachers from over 72,000 public and private schools.

Of the 249 teachers identified, 68% ($n = 169$) agreed to participate in the study. Chi-square analyses revealed that there were no statistically significant differences between responders and nonresponders in terms of grade, type of school, and location of school (all $ps > .09$). No analysis was done for gender, as only 4 of the 249 teachers were male. Analyses of variance further indicated that there were no statistically significant differences in school size or annual expenditure for materials per pupil in the schools where the responders and nonresponders taught (both $ps > .52$). Consequently, responders did not differ from nonresponders on these demographic variables, providing verification that they were representative of the sample as a whole.

The 169 teachers that agreed to participate were distributed almost equally among the three grades. These teachers were overwhelmingly female, and 76% worked in a public school. Thirty-nine percent of the participants taught in a school in a suburban area, 33% in an urban area, and 27% in a rural area. Average school size was 410 students, but there was considerable variability across schools. Expenditures per pupil for instructional materials was \$78.

The participating teachers averaged 15.2 years of teaching experience (Range = 1 to 40; $SD = 10.2$). The average class size was 19.3 (Range = 5 to 35; $SD = 4.7$), and approximately 70% of the children in the participat-

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ing teachers' classes were White, 13% Black, 10% Hispanic, 3% Asian, and 3% Other. Teachers reported that 37% (Range = 0% to 100%; $SD = 34\%$) of the children in their class received free or reduced cost lunch and 9% received special education ser-

vices ($SD = 11\%$). On average they reported that students spent 2 hours and 33 minutes writing during a typical week, but there was considerable variability in time spent writing ($SD = 2$ hours and 20 minutes). Finally, 53% of the teachers indicated that their highest degree was a Bachelor degree, 45% had a Masters degree, and 1% had a Doctoral degree.

Discussion

Handwriting is important because it influences both the reader and writer (Graham & Harris, 2000). The reader forms impressions about the quality of ideas in a hand written paper based on the legibility of text, and illegibilities may make part or all of the text impossible to read. Handwriting can also interfere with specific aspects of writing such as content generation, especially for young children who are still mastering this skill, whereas, difficulties acquiring this skill may lead some beginning writers to avoid writing, resulting in arrested writing development (Berninger, 1999; Graham, 1999). Experimental studies further demonstrate that teaching this skill to primary grade children can have a positive impact on both their handwriting as well as their writing (Berninger et al., 1997; Graham, et al., 2000; Jones & Christensen, 1999). Despite the importance of handwriting to early writing development, there has been concern about if and how this skill is taught to young children (Graham & Weintraub, 1996; Leo, 2002).

The findings from the current study provide some welcome news for advocates of explicit and systematic handwriting instruction for young developing writers. Primary grade teachers in the current study, drawn randomly from public and private schools across the United States, indicated that they taught handwriting, with 80% of their school districts requiring the teaching of this skill and 90% of them indicating that they provided an average of 70 minutes of instruction per week. This corroborates the findings from an earlier study that most primary grade teachers in the United States teach handwriting (Graham et al., 2003). Furthermore, the average amount of time devoted to instruction was generally consistent with recommendations to devote 50 to 100 minutes of instructional time each week to handwriting (Graham & Miller, 1980).

The frequency with which a minority of the teachers taught handwriting in this and the prior Graham et al. (2003) investigation raises one reason for concern. In the previous study, 25% of teachers taught handwriting once a week or less (2% did not teach it at all), whereas in this study 10% of teachers taught handwriting just once a week and 10% did not teach it at all. Handwriting is a motor skill and like most motor

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skills it is best learned through spaced practice (Graham & Miller, 1980). Thus, teaching it once a week or less is not preferable to teaching it several times a week or daily.

Of course, the effectiveness of handwriting instruction is not just dependent on providing instruction, but on what happens when instruction is delivered. Another area for concern was the finding that only 12% of the participating teachers reported that they received adequate preparation to teach handwriting in their college education courses. Lack of either instructional knowledge or knowledge of handwriting development could weaken the quality of teachers' handwriting instruction. College education courses are not the sole repository of such knowledge,

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however, as teachers can obtain information and expertise through ongoing professional development as well as through the process of actually teaching handwriting. Unfortunately, we did not ask teachers about other sources where they may have learned about handwriting.

Lack of formal preparation in college teacher education courses may be offset by teachers' use of commercial materials. Three out of every five teachers indicated that they used commercial materials for handwriting instruction. Ninety percent of these teachers used one of the well known basal handwriting programs such as the Zaner-Bloser program. Programs like this one provide both teaching materials and generally well designed teaching procedures (Sawyer, Graham & Harris, 1992). This provides no guarantee, though, that teachers use the materials as intended.

In any event, there were some reasons for optimism about the quality of handwriting instruction provided by teachers. First, when teaching students how to write letters, 60% or more of the teachers used the following effective practices (see Graham & Harris, 1989; 2002; Graham & Miller, 1980): modeled how to form the letter, students practiced the letter by tracing it and writing it from copy, praised students' for correct letter formation, and directed students to correct malformed letters as well as identify their best formed letters. Most teachers also taught students proper pencil grip and paper position, including how left-handers should position their paper. Slightly more than one-half of the teachers displayed examples of students' best handwriting, whereas a slightly greater percentage of teachers used specific procedures to promote handwriting fluency. Just as importantly, teachers commonly made specific

adaptations/modifications for students with poorer handwriting, including extra encouragement, one-on-one instruction, extra time to complete written assignments, and additional conferences with students about their handwriting.

These positive features of handwriting instruction are diminished somewhat by many teachers not using other proven methods and a minority of teachers using questionable procedures. For example, effective instructional practices for teaching letter formation, such as writing the letter from memory or comparing/contrasting how similar letters are formed (Graham & Miller, 1980) were applied by less than one half of the teachers. On the other hand, questionable practices, such as verbalizing the steps for forming a letter while writing it or requiring students to use a specific writing instrument (see Graham, 1992), were employed by almost a third or more of the teachers. Likewise, other than showing left-handers how to position their paper, other frequently recommended provisions (see Graham & Miller, 1980) for these students were applied by a relatively small percentage of teachers (one-third or less).

Another possible concern is that teachers' assessment of handwriting mostly involves informal techniques that rely heavily on subjective judgments. The fact that teachers' judgments about which letters are most difficult for primary grade students did not provide a good match to the letters identified as difficult via the systematic study of young children's writing (see Graham et al., 2001), which raises concerns about the accuracy of the participating teachers' evaluations.

It is interesting to note that many teachers had misconceptions about handwriting development (which also raises questions about the accuracy of their observations and knowledge about handwriting). Most of the research evidence shows that girls have better handwriting than boys and that there is no significant difference in the handwriting legibility and fluency of left handed and right handed students (Graham & Weintraub, 1996). Nevertheless, only about one-half of the participating teachers thought that girls had better handwriting, whereas slightly more than one-half of the teachers indicated that left handed children had better handwriting. Another example of teachers' misconceptions involved the development of a personal style of handwriting. Slightly more than 40% of the teachers thought that students' handwriting should not deviate from the taught style. This belief is at odds with what is currently known. It is almost a universal phenomenon for students to modify the script that they are taught, in part to increase how quickly they can write specific letters (Graham & Weintraub, 1996).

We also examined the sequential role of three factors in predicting handwriting achievement (as assessed by teachers' judgments about the legibility and fluency of their students' handwriting). We reasoned that

handwriting achievement is influenced by the amount of time devoted to handwriting instruction, which in turn is influenced by teachers' desire to provide handwriting instruction, and that such attitudes are shaped by teachers' competence (as measured by the quality of teachers' handwriting and the amount of formal preparation on how to teach handwriting provided in teacher education courses). To test this line of reasoning, we examined if the prediction of handwriting achievement was improved by adding assessments of teacher attitude to our measures of teacher competence, and by considering if this prediction was further improved by adding time spent teaching handwriting to the formula. We tested this model for both teachers' judgments about students' legibility and handwriting fluency. For the most part, the data was consistent with the proposed model. For handwriting fluency, measures of teacher competence

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predicted student performance and prediction was enhanced by sequentially adding measures of attitudes toward teaching and instructional time to the formula. The same pattern was found for handwriting legibility, except that the addition of instructional time to the formula did not improve prediction of student performance. These findings highlight the possible importance of teachers' competence and attitudes towards the teaching of handwriting, but must be viewed cautiously, as measures of student performance, instructional time, and teachers' competence were reported and not actually measured.

Finally, we assumed that teachers would be aware of elements of their teaching and would be able to relate this knowledge to questions about their instructional practices. While there is evidence that professionals, including teachers, can describe what they do when questioned (e.g., Diaper, 1989), the findings from the study need to be supplemented by additional research where teachers' instructional practices in handwriting are observed and not just reported.

In summary, handwriting is being taught by the overwhelming majority of primary grade teachers in the United States. Nevertheless, only a small percentage of teachers received adequate preparation on how to teach handwriting in their college education courses, and teachers' responses to questions about their handwriting program suggests that recommended instructional procedures are applied unevenly.

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