The Science of Effective Writing Instruction

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Recently, the "Science of Reading" has quite rightly attracted a great deal of attention. Being able to read well is essential in our society. Education critics have reasoned that following the research is the most certain way to provide children with the best reading instruction.

That approach makes a lot of sense. But what about writing? Writing, too, has been found to play an important role in the academic, psychosocial, and economic success of individuals (Graham, 2020). Delivering the most effective and efficient writing instruction is equally in students' best interests. As with reading, the surest way to guarantee maximum progress in learning to write is to align classroom practices with rigorously derived research-based knowledge.

Writing is a complex and sophisticated ability, and its development is equally complex. Writing development results from a combination of acquisition and direct instruction (Bazerman, 2009; MacArthur, Graham, & Fitzgerald, 2016). That means students require opportunities to write a lot, to experiment and approximate, to use their writing for authentic purposes, to err, and to self-evaluate. Their progress also depends upon the availability of teachers to provide them with thoughtful models and demonstrations, clear purposes, cogent explanations, positive encouragement, and incisive feedback.

The purpose of this white paper is to briefly present 10 key elements of an effective elementary writing program. The recommendations are research-based and focus on teacher actions that, in well-designed studies, have been

found to improve student writing ability. That does not mean that implementing these features will be sufficient. Rather, they must be enacted thoughtfully, sensitively, and with the same care that was evident in the implementations examined in the studies. These recommendations point out both what needs to be taught and how to deliver that instruction effectively.

1. Provide opportunities to write and to learn how to write well.

Research shows that writing instruction receives inadequate attention in far too many U.S. classrooms. (Brindle, Graham, Harris, & Hebert, 2016; Cutler & Graham, 2008; Gilbert & Graham, 2010; Gillespie Rouse, Kiuhara, & Kara, 2021; Shanahan, 1979). In response to that fact, the Writing Panel of the U.S. Department of Education's What Works Clearinghouse recommends that students receive daily writing instruction and practice (Graham, Bollinger, Booth Olson, D'Aoust, MacArthur, McCutchen, & Olinghouse, 2012). They noted that this recommendation has only minimal research support because there have been no direct tests of the impact of the specifics of the recommendation. Nevertheless, correlational studies show that more writing is associated with better writing (Coker, Jennings, Farley-Ripple, & MacArthur, 2018; Graham & Santangelo, 2014; Moats, Foorman, & Taylor, 2006), and research has long supported the importance of the amount of teaching in all subjects (e.g., Andersen, Humlum, & Nandrup, 2016). Proficiency is unlikely without sufficient practice.

Writing instruction may not necessarily be a daily occurrence. Nevertheless, writing and writing instruction should be a regular, ongoing part of any high-quality program of literacy instruction.

Provide students many opportunities to learn to write and to use writing. Without those opportunities, it is unlikely that your students will become the writers they can be, and they will miss out on the valuable learning advantages writing can provide.

2. Create a writing environment that supports and encourages writing.

Writing instruction should be delivered within a nurturing environment that encourages students to think of themselves as writers. Correlational studies report that the easy availability of writing materials and supports is associated with writing achievement and motivation (Wheeler, 1971; Zhang, Hur, Diamond, & Powell, 2015).

Classroom writing centers can offer a variety of writing implements (e.g., pens, pencils, markers, crayons) as well as paper choices (e.g., lined and unlined paper, colored paper, sticky notes, stapled blank books). Erasers, scissors, tape, and correction fluid provide support for easy fixes and revision, and examples of high-quality writing in various genres can be valuable. Also, various charts can provide useful reminders about writing and spelling processes and strategies along with text

organization supports (e.g., story starters and story maps). Some teachers like to include vocabulary sources, too—age-appropriate thesauruses or vocabulary folders that suggest alternative word choices (e.g., *said, told, whispered, yelled, announced, remarked, stated, commented*).

Research shows that technological resources are an especially powerful support. Students write more and better, gain greater benefits from instruction, and revise more willingly when computers are available (Graham & Alves, 2021; Graham, McKeown, Kiuhara, & Harris, 2012; MacArthur, Schwartz, & Graham, 1991). Computers make transcribing less laborious and do away with the tedium of recopying. They also may facilitate cooperative writing projects among pairs or groups of students.

3. Engage students in the writing process.

The term "writing process" refers to the steps that writers use to produce a finished piece of writing. To accomplish a final draft, writers engage in prewriting and planning, drafting, revising, and editing.

Prewriting includes planning and what a writer does to get ideas and organize them—including brainstorming, drawing, researching, or conducting interviews. *Drafting* refers to implementing the prewriting plan—getting one's ideas on paper. *Revising* means re-seeing the writing—adding to it, subtracting, and refining or reorganizing the ideas—make it coherent, complete, effective, and powerful. Finally, there is *editing*, which means preparing a clean copy for sharing with others, including fixing spelling problems, getting punctuation and formatting right, and the like. Research shows that engaging students in—and guiding them through—the writing process leads to higher writing achievement (De La Paz & Graham, 2002; Graham & Alves, 2021; Graham, Bollinger, et al., 2012; Graham & Sandmel, 2011; MacArthur, et al., 1991; Tracy, Reid, & Graham, 2009). That does not mean there should be a rigid progression through all those steps for each and every piece of student writing. Students may go no further than drafting with some pieces, and with others the process will be a recursive one—going back and forth between steps.

Attention to the writing process should include more than practice. Teachers should demonstrate how to implement the various steps and provide guidance. For instance, young children may plan by drawing a picture, and teachers can assist by helping them to "find the story" in their pictures. Asking questions about the drawings can help students to articulate their ideas. Also, encouraging reflection on the processes—how students got their ideas, what they revised and why, how the editing improved their final project—can transform classroom writing process activities into habits of mind.

4. Teach students how to write and to write well.

According to the research, of everything we do to improve student writing, the most powerful is explicit instruction. Strong research evidence shows that we can teach students strategies—for negotiating the writing process, for writing for purposes or specific genres, for considering the needs of audiences, and for producing thoughtful, effective writing pieces (Coker, Jennings, Farley-Ripple, & MacArthur, 2018; Collins, Ciullo, Graham, Sigafoos, Guera & Judd, 2021; De La Paz & Graham, 2002; Finlayson & McCrudden, 2020; Graham & Alves, 2021; Graham, Bollinger, et al., 2012; Graham, MacArthur, et al., 2018; Harris, Ray, Graham, & Houston, 2019; Tracy, Reid, & Graham, 2009).

Several studies that evaluated the effectiveness of strategy instruction showed consistently positive results. These strategies are usually presented to students as a series of sequential steps that students can implement to accomplish writing goals. One such strategy, **POW**, guides students to **P**ick their ideas, **O**rganize their notes, and **W**rite and say more. Another strategy, **TREE**, reminds students to introduce a **T**opic, provide three or more **R**easons, **E**xplanations of those reasons, and an **E**nding. Some strategies guide students to analyze writing prompts—identifying purpose, audience, topic, and genre. Others may focus on the content or style of the papers to be written (e.g., structure, elaboration, focus, diction, sentence variation).

The point is to teach students to craft better compositions and to become more independent and purposeful in their writing habits. Considerable time should be devoted to this kind of instruction and practice. Teachers should explain the purposes of each step, model how the steps are to be carried out, and then guide students to practice both individual steps and the combined series of steps until students can implement the strategy independently and effectively.

5. Teach students relevant foundational skills.

Research also highlights the importance of providing students with explicit instruction in the foundational skills of writing. Students who have received direct teaching of spelling, handwriting, keyboarding, and sentence and paragraph construction produce higher-quality writing than those who haven't received such teaching (Graham, Harris, & Adkins, 2018; Graham, Bollinger, et al., 2012; Graham & Santangelo, 2014; Graham, Wijekumar, Harris, Lei, Fishman, Ray, & Houston, 2019; Lavoie, Morin, Coallier, & Alamargot, 2020; Saddler & Graham, 2005; Santangelo & Graham, 2016). Indeed, those students spell more words correctly and with more legible handwriting. But even more important, the studies reveal that teaching foundational skills enhances the quality of student writing.

Struggles with handwriting and spelling may interfere with and distract from higher-level writing processes. Students laboring over their handwriting or balking at the spelling of a needed word

are not focused on purpose, the formulation and organization of ideas, or audience considerations. Those who have confidence in and proficiency with basic writing skills have greater cognitive resources available for composing well.

Spelling instruction can easily and profitably be combined with phonemic awareness and phonics teaching. Integrating decoding and encoding instruction has been found to be a powerful combination, enhancing learning on both sides of the page—for the reader and the writer. Likewise, there are multiple ways to get words on paper, including by hand using manuscript or cursive and keyboarding, and students benefit from instruction in each of those at the proper time. Formal grammar instruction has not been found to improve writing achievement, but instruction in sentence combining and sentence reduction has. Teaching students how to compose well-formed sentences has been found to enhance writing quality and reading comprehension. Writers can be taught both to simplify and to complicate how they express their ideas, and such instruction pays off in higher-quality writing and more confident writers.

6. Provide high-quality instruction.

The two previous guidelines focused on curriculum—what about writing we need to teach. This guideline is different in that it focuses on teaching—how to teach those things effectively. Research shows that how we teach writing has a powerful impact on student learning.

Effective writing instruction is explicit. Some students may be able to discover how to write on their own, but learning is more certain and equitable with explicit teaching. That means lessons and assignments should have clearly articulated purposes. Students do better when they know what they are supposed to learn.

Research shows that composition instruction is best delivered using a "gradual release of responsibility" approach. In this approach, teachers start by explaining a strategy (what it is, why we use it, how it is implemented) and demonstrating how it works. Then students try to implement the strategy, usually as a group, with teacher guidance. Students must learn the steps in the process and how to implement them, but also the purposes of the steps. Over time, the teacher gradually withdraws support, with students assuming more responsibility and doing more of the work individually without guidance.

With foundational writing skills, closer guidance and repetition matter more. For instance, to teach students to write letters, students might start out tracing letters, then copying them, and finally trying to write them without any guidance. For each of these steps, the students would make many attempts to form the letters.

Both with composition and foundational skills, purposeful practice is essential. Students benefit from opportunities to write for authentic purposes. Practicing a strategy for composing letters to the editor is worthwhile but is more likely to become part of a student's writing repertoire if they can write real letters to a real editor. Likewise, practicing one's printing or handwriting skills will be more engaging if the outcome is greater legibility of the pieces that students are writing to share with classmates. An important dimension of authenticity in writing is the opportunity to communicate with a variety of audiences for a variety of purposes. Expanding the audience for student writing—beyond the teacher but also sometimes beyond the classroom—leads to better writing (Sperling, 1996).

Quality instruction includes quality assessment. Ongoing evaluation of student progress and timely feedback in response to that evaluation can make a big difference in student progress (Graham & Alves, 2021; Graham, Hebert, & Harris, 2015; Graham, McKeown, et al., 2012). Assessments should be focused on the goals of writing instruction. Such assessment allows instructional differentiation, and it can be the basis for students' own self-evaluation.

7. Create a community of writers.

Another recommendation of the What Works Clearinghouse Writing panel (Graham & Bollinger, et al., 2012) is that teachers should try to "create an engaged community of writers" in their classrooms. Unfortunately, most studies have not isolated this feature of instruction. Nevertheless, it has often been a part of successful instructional approaches with typical and struggling students. Given the consistency of its inclusion in effective instructional routines and more recent research evidence, it seems reasonable to encourage collaboration and peer assistance in the writing class (De Smedt, Graham, & Van Keer, 2020; Graham & Alves, 2021; Graham, McKeown, et al., 2012; Graham & Sandmel, 2011; Jones, 2015; Roth & Guinee, 2011; Saddler & Graham, 2005; Sperling, 1996).

Basically, the idea is to get students to work together to enhance their writing quality. This can be accomplished in many ways. Perhaps students will take part in shared brainstorming to generate ideas for their compositions. They may participate in collaborative writing, taking turns writing parts of a story, article, or play. Many teachers adopt classroom routines for the sharing of student writing and for eliciting feedback as the basis of revision. Teachers are encouraged to join their classroom writing community, conferencing with young writers regularly, demonstrating or modeling sound writing behaviors, and even sharing their own writing with the students.

This recommendation requires some cautions. Sharing one's writing entails a certain amount of risk-taking and potential embarrassment. It is essential that teachers prepare students to be sensitive partners and that they seek to develop in their students the ability to mix positive responses with helpful advice. Forming a sensitively positive community of writers is a valuable instructional support.

8. Boost students' writing motivation.

Writing is challenging. It can be hard to maintain one's commitment to effective communication and self-improvement. Effective instruction is encouraging and intentional in its efforts to get students to appreciate the value of writing and to view themselves as capable writers (Graham & Alves, 2021; Graham, et al., 2019; Troia, Shankland, & Wolbers, 2012). Many of the points already made can contribute positively to student motivation. The use of technology, collaborative writing activities, clear goals, and self-assessment possibilities all may contribute to students' sense of self-efficacy and social belonging as writers and to their appreciation of the value of writing.

Other instructional moves that can serve to motivate students include allowing students to write about topics of their own choice or to modify the teacher's prompt to something more personally interesting. It makes sense to sometimes provide those kinds of options. However, remember students sometimes balk at writing because they "don't know what to write about." In that circumstance, assigning a topic or genre can be the more motivational way to go, and even better is instruction aimed at developing strategies for identifying topics of interest. Similarly, some writing approaches may seem pointless or unnecessarily onerous for students. For example, despite the importance of revision, too much emphasis or inappropriate emphasis on revision can be problematic. Not every writing piece needs to be revised, and providing some time delay between drafting and revision can be supportive.

9. Connect reading and writing.

Reading and writing have been shown to be closely related—they rely on a similar base of skills and knowledge, they are two sides of a communications process, and they can be usefully combined to accomplish both instructional and functional goals. Teaching reading and writing together can improve both reading and writing abilities (Graham, Aitken, Hebert, Camping, Santangelo, Harris, Eustice, Sweet, & Ng, 2020; Graham & Hebert, 2011; Graham, Liu, Ng, Bartlett, Harris, & Holapfel, 2017; Shanahan, 2006; Shanahan, 2016; Tierney & Shanahan, 1991).

Decoding instruction and spelling instruction can be combined both for greater efficiency and effectiveness. The same point can be made about any of the skills shared by reading and writing, including text organization, vocabulary, genre features, sentence construction, cohesion, and so on. It is important, for example, to know both the meanings of words and how to use those words.

Furthermore, readers need to develop a sensitivity to an author's point of view, choices, persona, and so on. Writers, on the other hand, must develop the ability to anticipate an audience's needs, knowing when to provide background information, definitions, or further explanation. This kind

of communicative competence develops from writing for real audiences and reading with an eye to an author, and these kinds of activities exert positive influences on both reading and writing outcomes.

Finally, reading ability is integral to the writing process: writers often read as part of prewriting, and revision depends on their ability to read their own writing thoughtfully and critically. Often, writers depend upon texts as models of what they are trying to write. Again, these benefits have been found to be reciprocal. For example, having students write about the texts that they read— summarizing, analyzing, critiquing, synthesizing—improves their reading comprehension.

10. Use writing to increase knowledge.

The previous recommendations focused on what students need to be taught about writing and how best to nurture that learning. This final point focuses, instead, on encouraging students to use their writing. If students only compose during writing instruction time, they are not likely to get good at it or to value it. Writing has been found to be an especially effective learning tool. Writing about subject matter increases student knowledge of that subject.

Writing about the content they are learning in social studies, science, math, and the arts improves student mastery of those subjects (Graham & Hebert, 2011; Graham, Kiuhara, & MacKay, 2020; Shanahan, 2004). In many subject areas, it is thought that students do not truly understand a concept until they can cogently and accurately explain it in writing. Writing for the purposes of other subject areas should be a daily occurrence in classrooms. Even young students have been found to benefit from using writing to explore and learn content.

Over time, research on writing instruction can be expected to increase our understanding of how best to nurture young writers. Until then, these 10 research-based recommendations should provide the best guidance for providing high-quality and effective elementary school writing instruction.

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