Creating Better Readers and Writers

The Importance of Direct, Systematic Spelling and Handwriting Instruction in Improving Academic Performance

By J. Richard Gentry, Ph.D., and Steve Graham, Ed.D.
Creating Better Readers

“No subject of study is more important than reading . . . all other intellectual powers depend on it.”

—Jacques Barzun, cultural historian and former Columbia University dean

**Literacy: The Foundation of Education**

Reading is at the heart of education, the basic skill upon which all others are built. Learning to read and write provides the foundation for both academic and economic success. The vast and ever-expanding array of human knowledge, particularly in the sciences and technologies, means that today's students must master increasingly complex skills throughout their lives to compete effectively in the 21st century global economy.

Learning to write letters and spell words reinforces the letter-naming, phonemic, and word-deciphering skills required in developing literacy. This instruction assists children in developing the pre-reading skills associated with proficient reading by the end of the first or second grade: phonological awareness, letter identification, and vocabulary development. Further, students' reading skills and comprehension are improved by learning the skills and processes that go into creating text.

An extensive and evolving body of research shows that direct and explicit spelling and handwriting instruction is required if all students are to master the mechanics of reading and writing—which is not only a requirement of federal and state legislation, but also a critical goal for a nation whose economy has transitioned from a manufacturing to a knowledge base. As these skills become automatic, students are freer to concentrate on the higher-level thinking and communication skills needed for success in school and life.

**The Science of Spelling and Literacy**

Today, a catalog of research in education, psychology, and neurology—including brain-scanning studies—supports the central role that spelling plays in learning to read and write proficiently. This research clearly documents that knowledge of spelling is connected to reading, writing, and vocabulary development because they all depend on the same language abilities.

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5. Snow and others, *Knowledge to Support the Teaching of Reading*, 85.
Spelling Must Be Taught—Not Caught

Even though spelling is powerfully connected to reading and writing, it is best taught as a standalone subject. As reported by researcher Linda Allal, a sizable number of spelling studies support direct instruction, while “approaches integrating spelling acquisition in text production (integrated approaches) do not yet constitute a well-recognized instructional option validated by long-term empirical research in the classroom.” Although students acquire some spelling knowledge while reading and writing, this process should be augmented by direct instruction that teaches students to examine words in and of themselves. A self-contained basal spelling program that teaches students to spell words from a research-based, grade-by-grade spiraling curriculum based on spelling patterns and words used in student writing is more efficient than learning from context.

Research provides clear evidence that spelling should be taught systematically. The right words and patterns must be presented at the right time in the student’s development. Just as a teacher matches “just-right” books to each student for independent reading, he or she must match the right spelling words with each class.

Components of an effective spelling curriculum include:

- Research-based, developmentally appropriate word lists designed specifically for students at each grade level
- A bound print or cohesive electronic student text with a grade-level specific spelling dictionary and thesaurus, with assignments that can be teacher-directed or assigned for independent completion
- Direct, explicit instruction in short, 10- to 15-minute sessions daily or several times a week, using a pretest/study/posttest format
- Strategies and materials to teach children self-correction techniques and how to study unknown words
- Word sorting exercises, spelling games, and board games
- Differentiation and modification to support and challenge students at all proficiency levels, and
- Technology to enhance instruction, practice, and data management.

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8 Allal, “Learning to Spell in the Classroom,” 145.
10 Ibid., 55.
11 Ibid., 59.
12 Ibid., 56.
14 Frank Smith, Essays into Literacy: Selected Papers and Some Afterthoughts (Portsmouth, NH: Heinemann, 1983), 121.
Today’s spelling textbooks are based on the understanding that spelling is a psycholinguistic, conceptual process involving knowledge of the alphabet, syllables, word meaning, and the history of words in English. Effective spelling instruction explores patterns that can be detected in the sound, structure, and meaning of words. It covers understanding the concepts of words, segmenting sounds and syllables, recognizing letters, and learning how letters relate to sounds. It helps students develop insights into how words are spelled based on sound-letter correspondences, meaningful parts of words (such as roots and suffixes), and word origins and history.

Teaching spelling is a brain-building boon for effective reading and writing, creating a “dictionary in the brain” for every reader and writer. The more deeply and thoroughly a student knows a word, the more likely he or she is to recognize it, spell it, define it, and use it appropriately in speech and writing.

**Handwriting Wires the Brain for Literacy**

Solid familiarity with the visual shapes of individual letters is an absolute prerequisite for learning to read. Writing aids in letter recognition, the most reliable predictor of future reading success.

Learning to write by hand plays a key role in developing literacy, and handwriting skills remain crucial for success throughout school. The mental processes involved in handwriting are connected to other important learning functions, such as storing information in memory, retrieving information, manipulating letters, and linking them to sounds.

The letters of the alphabet are not learned holistically. They are acquired through a “visual system” in the brain that breaks down each letter into its parts. To write a letter, a child must identify the letter by name, memorize the letter’s form, and quickly access and retrieve this form from memory.

**Manuscript and Cursive Handwriting**

Effective handwriting instruction begins with teaching the manuscript alphabet. Forming the vertical and horizontal lines of the manuscript alphabet helps students master the seemingly abstract forms of 26 uppercase and lowercase letters, punctuation marks, and numerals—114 symbols in all—that they must decode while learning to read. These printed uppercase and lowercase letters closely resemble the type used in children’s books, which reinforces letter recognition.

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20 Adams, *Beginning to Read*, 55.
21 Ibid., 111.
One study of first grade students found that examining a model of the letter marked with numbered arrows indicating the nature, order, and direction of component strokes, combined with reproducing the letter from memory, produced the best handwriting performance.\(^{25}\)

Most students progress to cursive handwriting by Grade 3. Studies have shown that cursive is important for cognitive development because it "requires fluid movement, eye-hand coordination, and fine motor skill development," according to Frances van Tassell, an associate professor at the University of North Texas.\(^{26}\)

Components of an Effective Curriculum

An effective handwriting curriculum gives teachers and students the resources to master both manuscript and cursive handwriting through:

- Lesson plans that provide a logical sequence for studying letter formation in developmentally appropriate ways. For example:
  - Letters that are easier for young children to produce are introduced before more difficult ones.
  - Letters that are formed in similar ways or share common characteristics are grouped together.
  - Letters that occur more frequently are introduced earlier than less common letters.
  - Easily confusable or reversible letters, such as u and n or d and b, are not included in the same unit.
  - Students master forming each individual letter before proceeding to connect letters into words and words into sentences.\(^{27}\)

- Textbooks that provide instructions for writing each individual letter, with numbered arrows indicating the nature, order, and direction of component strokes\(^{28}\) that students can use for tracing and as models for practice.

- Explicit, hands-on instruction by the teacher in how to form the strokes of each letter, how to connect letters into words, and how to make words into sentences. This instruction should occur in short, 10- to 15-minute sessions daily or several times a week.

- Practice pages with printed letters, words, and sentences above blank lines where students can copy them without the distraction of having to look up to a board and then back to their writing.

Through this carefully planned, explicit handwriting instruction, students develop legible and fluent handwriting. As students learn to recognize and reproduce letters in words quickly and effortlessly, their minds are freer to concentrate on meaning when writing. This likely allows them to generate, organize, and express ideas more effectively.

Creating Better Writers

"Writing and learning and thinking are the same process."

—William Zinsser, American writer, editor and teacher


\(^{27}\) Graham, “Want to Improve Children’s Writing?” 24.

\(^{28}\) Ibid., 23.
Spelling: The Hallmark of Good Writing

Spelling instruction aids in vocabulary formation, which increases depth and complexity of expression—giving students a ready supply of words needed to tell fictional stories and write essays and research papers.

Good spelling supports speed and fluency in writing. When students struggle to spell a word, they must pause in the writing process, often causing them to lose their train of thought and become frustrated.

Struggling with spelling also limits students’ range of expression. As a result, many students will choose to use a much simpler word that they know how to spell rather than use a more sophisticated word that lives in their oral vocabulary but for which they are less sure of the spelling.29

Handwriting: Entry to a Lifetime of Composition

Writing skills are critical for both academic and professional success. Handwriting presents the biggest barrier students must overcome in learning to write. The focused thought that young writers must put into how to form letters interferes with other writing processes.30

Early, systematic handwriting instruction improves the quality and quantity of writing, not just its legibility. The goal of a handwriting curriculum is to teach children to write letters legibly and efficiently, so that writing becomes fluid and automatic.

The need for handwriting instruction is not limited to the early grades. In Grades 4 to 6, handwriting fluency still accounts for 42 percent of the variability in the quality of children’s writing,31 and students’ handwriting speed continues to increase at least until Grade 9.32

Recent research has shown that the development of higher-order thinking skills, including problem solving and analytic thinking, is related directly to the student’s ability to put thoughts on paper using intelligible language. The medium of expressive language allows students to reflect on ideas and translate knowledge and meaning.33

Fostering Success for English Language Learners and Bilingual Students

For English Language Learners (ELLs), it is much more difficult to learn English spelling than spelling in other languages, such as Spanish. Despite the challenges, learning the English spelling system helps ELLs and bilingual students learn letter/sound correspondences, increase vocabulary, and develop greater fluency in reading and writing. Through the systematic study of related words, students begin to see that English, like all languages, is governed by rules.

Vocabulary acquisition has a greater impact on reading than other factors, including oral language, for ELLs.34 Research points to a relationship between word knowledge and reading achievement.35 Words learned by spelling patterns and relationships can assist ELLs in developing a rich vocabulary that supports reading and enhances writing.

34 Proctor and others, “The Intriguing Role of Spanish Language Vocabulary Knowledge in Predicting English Reading Comprehension,” 159-169.
Studies suggest that ELL reading success in Grades K to 1 can be predicted by phonological awareness,36 development of the alphabetic principle,37 and word knowledge.36 In Grades 2 to 6, ELL reading success can be predicted by fluency, the ability to read words automatically,38 and by vocabulary, which is a major contributor to comprehension.40

Students who are literate in their first language can draw upon those literacy concepts and skills as they learn to write English. Even when the writing systems are different, research shows that concepts about the meaning and constancy of letters and symbols, and skills such as alphabet knowledge and phonological awareness, will transfer to another language.41

Because handwriting is an important communication skill that reinforces reading, spelling, and writing, it also is critical for ELLs. These students need time and explicit instruction to master proper letter formation.

An effective curriculum assists teachers in demonstrating the academic language needed to teach handwriting (size, shape, spacing and slant) through Total Physical Response (TPR) and other second language approaches. It should provide support for students at multiple levels of English language proficiency.

**Building Blocks for Succeeding in a Technology-Driven World**

Citing the availability of personal computers, smart phones, and spell-check programs, some discount the importance of spelling and handwriting in the modern world. Yet educators and researchers agree that spelling and handwriting will always be an important part of a student's education. Here's why:

- Knowledge of spelling is connected to reading, writing, and vocabulary development, which all depend on the same language abilities.42
- In 80 percent of elementary schools, students rarely, if ever, use word-processing software for writing.43 Very few classes have enough computers to make regular use of word processors possible.
- While older students use computers to complete lessons, perform research, and write papers, handwriting continues to play a crucial role in note taking and in the creative process.
- The most equitable curriculum standards are based on textbooks, paper, and pencil. Poorer school districts lack access to computers, and fewer students from disadvantaged homes have access to computers and high-speed Internet at home.
- Spell-check programs actually increase the need to teach spelling and precise word usage more thoroughly.44 These programs can identify only words that are misspelled. They ignore words that are correctly spelled but misused.

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42 Snow and others, *Knowledge to Support the Teaching of Reading*, 85.

43 Cutler and Graham, *Primary Grade Writing Instruction: A National Survey,* 907-919.

• In a society in which texting and word processing are commonplace, handwritten communication is perceived as distinctive and special.

• Documents such as business letters, checks, and legal documents generally require handwritten signatures.

• Many historical documents as well as modern letters and thank-you notes are written in cursive. This puts students who cannot read cursive handwriting at a disadvantage.

**Increasing Instructional Effectiveness Through Technology**

Today's educators employ a variety of technology platforms to increase the effectiveness of spelling and handwriting instruction:

• Interactive whiteboard (IWB) applications are ideal for presenting word sorts, a research-based technique for helping students recognize and understand common spelling patterns as well as the relationships between and among words demonstrated by spelling patterns.

• In handwriting instruction, IWB applications help teachers demonstrate proper letter formation and encourage students to emulate the correct strokes.

• In addition, research has demonstrated that games are a valuable incentive in spelling practice. Digital games bring this research into the 21st century.

**The Importance of Explicit, Direct, Comprehensive, and Research-Based Instruction**

Because of the role they play in developing literacy and composition skills, spelling and handwriting are critical to overall academic achievement. For example, one study found that handwriting and spelling skills together account for a sizable proportion of the variance in the composition skills of 600 children in Grades 1 to 6 (up to 42 percent of the variance in writing quality and 66 percent of the variance in writing output).

As a result, it is imperative that students receive focused, direct, and explicit instruction in these subjects on a frequent basis beginning in the early grades when lifelong study habits are formed. Although some publishers of integrated and balanced language programs advertise that spelling and handwriting are covered by these programs, it is important to compare these integrated components to research-based methods that have demonstrated effectiveness in teaching children to read, write, and spell fluently.

**Spelling**

Research provides clear evidence that spelling should be taught systematically. The right words and patterns must be presented at the right time in the student's development. A self-contained basal spelling program teaching students to spell words from lists, based on spelling patterns and words used in student writing, is more efficient than learning them from context.

With a comprehensive spelling series, creating spelling words from frequency lists (rather than content vocabulary) guarantees the usefulness of words for most writing demands. Words learned from the 4,000 most commonly used words (accounting for nearly 98 percent of words used in ordinary writing) provide a "security blanket" leading to greater fluency in writing.

The organization of spelling lists should highlight principles of English spelling (e.g., phoneme-grapheme, sound-to-pattern, and meaning-to-pattern principles) to promote the development of orthographic concepts. In addition, basal spelling programs can control the difficulty of lists by frequency and by word length, successfully differentiating task difficulty.

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Handwriting

There is considerable scientific evidence, collected over a span of almost 100 years, demonstrating that directly teaching handwriting enhances legibility and fluency.\(^{47}\) Children, especially those who struggle with handwriting, benefit from carefully planned, explicit handwriting instruction.

The quality of handwriting has a marked effect on the writing and academic performance of all children.\(^{48}\) Even in this age of word processors, children's handwriting can have a profound impact upon their learning and the acceptance of their ideas. Increasingly, standardized tests include a written essay that is holistically scored by trained graders. There is evidence that the quality of handwriting significantly skews the evaluation of these essays.\(^{49}\)

**A Small Investment Yields Significant and Lasting Results for Students, Schools, and Society**

The fate of state and national economies rests on the ability of U.S. thinkers and workers to compete on a global scale. As governments struggle to balance budgets, they must make difficult decisions about allocating limited funds. Yet, research shows that investments in school quality improvements can, over time, cover the entire costs of primary and secondary schooling.\(^{50}\)

Because reading and writing are required to master any subject, a small investment in effective spelling and handwriting instruction pays big rewards in increasing student performance across the entire school curriculum.

Textbooks that provide students with the most current, research-based spelling and handwriting instruction are essential to teach these subjects effectively:

- In handwriting, students must be able to trace over and write directly beneath the appropriate letter and word models.
- In spelling, a bound textbook contains a dictionary and thesaurus for listed words and keeps the word lists together for the periodic review and assessment that is essential for mastery.
- Authorship by leading handwriting and spelling researchers ensures that lesson plans, word lists, letter formation, and other covered materials are developmentally appropriate for students in each grade level.
- Textbooks allow students to easily practice independently at school and home using their printed copies or accompanying electronic components.
- Textbooks provide tangible guidance to parents about the learning material their children must master, making it easier for parents to take an active role in homework.

Handwriting and spelling textbooks are among the least expensive materials in the entire reading and language arts curriculum. The cost per pupil can be up to 75 percent less than the cost of implementing a reading program on an average per pupil cost basis. Such a small investment yields considerable returns, as students' reading, vocabulary, sentence-writing skills, the amount they write, and the quality of their writing all improve along with their spelling and handwriting.\(^{51}\)

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\(^{50}\) Hanushek, “Why Quality Matters,” 17.

Spelling and handwriting should be explicitly taught in short, 10- to 15-minute sessions daily or several times a week, with appropriate materials for additional independent practice. Such a small investment yields considerable returns, as students’ reading, vocabulary, sentence-writing skills, the amount they write, and the quality of their writing all improve along with their spelling and handwriting.

Boosting Cross-Curricular Achievement and Test Performance

Good spelling and handwriting skills increase speed and fluency in both reading and writing. Becoming proficient at spelling and handwriting gives students the confidence to tackle more challenging work and the skills they need to succeed across the full academic spectrum. These skills play key roles in mastering academic subjects, in developing critical thinking skills, and in demonstrating mastery to teachers and degree-granting institutions. And, with the increasing importance of state proficiency tests and the addition of a written component to both the ACT and SAT—the two most popular college entrance exams—good spelling and handwriting skills offer a competitive edge to college-bound students.

When writing, students with poor spelling skills often pause, which disrupts their train of thought, causes frustration, and limits their range of expression. Struggling with handwriting can lead to a self-fulfilling prophecy in which students avoid writing, think of themselves as not being able to write, and fall further and further behind their peers.

Fast, legible handwriting improves note-taking and test performance. Students must be able to quickly record notes to capture contents of lectures, must be able to read their notes to study for tests, and must be able to write quickly and legibly to complete timed tests.

Neatness counts. Illegible or poor handwriting can hinder students in getting fair and objective grades. Studies show that teachers give better scores to legible assignments and tests even when the content is the same. Yet, when students have to write quickly, such as when taking notes or working on a timed test, the legibility of their text declines.

From elementary school through postsecondary education, the majority of high-stakes tests include the timed, impromptu essay, nearly always handwritten, as a measure of writing performance. Components of state proficiency tests, essays on the College Board SAT and ACT, and the majority of Advanced Placement tests require handwritten responses, emphasizing the importance of handwriting in high-stakes testing. To score well:

- Students must be able to quickly organize their thoughts and fluently record them in a short time. On the ACT writing test, for example, students have 25 minutes to write a two-page essay that graders must read and score in four minutes.
- Essay readers must be able to decipher a student’s handwriting to provide an evaluation. A paper that is illegible cannot be scored.

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53 Graham and others, “Is Handwriting Casually Related to Learning to Write?” 620-633; Jones and Christensen, “Relationship between Automaticity in Handwriting and Students’ Ability to Generate Written Text,” 44-49.
54 Jones and Christensen, “Relationship between Automaticity in Handwriting and Students’ Ability to Generate Written Text,” 44-49.
According to recent research, written tests taken on paper severely underestimate the performance of students accustomed to working on computer. This underscores the need for fluent, legible handwriting by even the most technology-savvy students.  

**Saving Time and Money**

A small investment in direct, explicit spelling and handwriting instruction can save countless hours of frustration by students who are struggling in school and produce considerable cost savings by reducing the need for later intervention.

Students who enter college not fully prepared in English or mathematics must take non-credit preparatory courses before beginning coursework leading to a degree. Costs of this remedial education are borne by students, parents, institutions, and taxpayers. About one third of all college freshmen take at least one remedial course. A 1995 study using data from the National Center for Educational Statistics estimated that remedial courses consumed more than $1 billion, or about one percent, of public education budgets nationally.

With so much at stake, the investment of instructional time and purchase of current textbooks needed to help students become proficient at reading, spelling, and writing appears small by comparison.

**About the Authors**

**J. Richard Gentry, Ph.D.**, is an internationally acclaimed author and researcher and is recognized for groundbreaking work in spelling and Pre-K through second grade emergent literacy. His breakthrough insights on the early connections of reading, writing, and spelling are unraveling the mysteries of how teachers should teach and how children learn to read and write. His new book for parents, *Raising Confident Readers*, is the culmination of more than 30 years of experience in childhood education. He is also the author of *Breakthrough in Beginning Reading and Writing*, *Step-by-Step Assessment Guide to Code Breaking*, *Breaking the Code*, and *The Science of Spelling*. His blog posts for *Psychology Today* offer advice to parents on raising readers, writers, and spellers.

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