

Research based Tutoring of English Spelling

White Paper

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This White Paper looks at the importance of spelling in modern society and reviews current research. It further illustrates how spelling is taught in a traditional setting and compares it with the new tutoring processes designed by eSpindle Learning.

Why spelling matters

English is full of irregularities and orthographic challenges because it has been influenced by a myriad of different cultures.

Poor spelling skills are associated with limited intellectual ability in our society, and carry a negative stigma. Limited spelling capabilities not only reflect poorly on the individual, but also on the companies that employ them.

Surveys of Fortune 500 companies in 1978, 1985, and 1995, published in the Career Development Journal, focused on trends in the evaluation of resumes.

Compared to earlier years, the later survey found more emphasis on grammar and spelling: More weight was given to a candidate's spelling skills than even their grade average or previous work experience.

With spelling and language skills on a continuous decline, mastery in this area is more than ever taken as an indicator of a superior education, an hard-working character and intelligence.

Spell checkers do not replace knowledge

Since spell checkers are widely available today, many frustrated students (and frequently even their parents and teachers) have decided not to worry about their declining spelling skills.

However, research shows that spell checkers and similar tools may actually cause poor spelling development (Graham, 2000). Giving spell checkers the final authority over one's writing hurts language awareness along with memorization and visualization skills - the building blocks to correct spelling. In addition, spell checkers only catch a limited range of errors (MacArthur, Graham, Hayes & De La Paz, 1996).

To say that spellcheckers have made learning unnecessary is similar in its logic to stating that obesity is not a problem, since cars can transport us, even if our bodies can't - a statement not likely to be advocated.

Knowledge buried in a computer's memory is little help in kindling inspiration, fostering critical thinking, and promoting mental development.

To develop solid language skills is to equip oneself with the raw materials for complex thought and the essential tools for communication. Spelling is an important building block in developing solid language skills.

The role of spelling

Incorrect spelling is known to affect both our writing and reading capabilities. Lack of skills will make us avoid uncommon words, resulting in prose that is void of advanced vocabulary and likely fails to please and impress.

Academic performance and grades will be affected too, since individuals with low spelling confidence and skills

not only write less and more plainly, but may simply not be empowered to adequately express their knowledge in various subject areas.

In addition, the correlation between spelling and reading skills has been acknowledged by many researchers. Not only are strong readers better spellers, but low spelling skills measurably hinder a student's reading ability. "As spelling ability improves," a White Paper of Learning by Design, titled *Spelling Performance Evaluation for Language & Literacy*, states, "... an individual is likely to show gains in reading, decoding, fluency and comprehension skills."

Spelling and reading share the same underlying language knowledge (Ehri, 2000).

A summary of research (Pressley, 2002) shows that direct vocabulary instruction can improve reading comprehension

if students are taught many specific words thoroughly over time.

Many studies have correlated the active possession of an expansive vocabulary with success on numerous levels: Professional, financial, and interpersonal.

By contrast, individuals with remedial verbal skills often have difficulty in organizing and expressing complex thoughts, and lose their voice in society. "Literacy can be thought of as a currency in this society," states the summary of the *National Assessment of Adult Literacy*.

Americans of low language skills are more likely to be unemployed, live in poverty, or become incarcerated. They are much less likely to vote or become actively involved in their communities.

Eye halve a spelling chequer
It came with my pea sea
It plainly marques four my revue
Miss Steaks eye kin knot sea.

Eye strike a key and type a word
And weight four it two say
Weather eye am wrong oar write
It shows me strait a weigh.

As soon as a mist ache is maid
It nose bee fore two long
And eye can put the error rite
Its rarely ever wrong.

Eye have run this poem threw it
I am shore your pleased two no
Its letter perfect in it's weigh
My chequer tolled me sew.

-- Sauce unknown

Our schools

Most American schools have left behind the days of rote, authoritarian learning: An approach that focused largely on memorization and discouraged students' questions, criticism, and other forms of independent thinking.

Leaving behind this inflexible, often fear-inducing system has certainly had a positive impact on students' abilities to learn and to function in modern society.

Over the last few decades, innovative spelling programs, from invented spelling to elaborate phonetics-based programs, have tried to improve traditional solutions. While these programs excel in getting children started on their path as writers, sooner or later they need to be complemented by memory-based spelling tutoring.

English is full of irregularities, and they can only be learned by active practice. If students don't obtain appropriate spelling and vocabulary skills at a certain grade level they will start to feel insecure, and the confidence with which they express thoughts will suffer.

Researchers have documented "a significant vocabulary gap among children entering school and the fact that gaps in vocabulary and reading achievement widen throughout the school years" (Baker, Simmons, & Kame'enui, 1995).

A number of education specialists now propose that in our zeal to reform we threw out the baby with the bathwater when it comes to memory-based learning, as needed for spelling and vocabulary.

While spelling skills are part of the current educational standards, they are incorporated in a very general format ("uses conventions of spelling in written compositions") and are not part of the annual No-Child-Left-Behind (NCLB) testing program.

Consequently spelling tutoring has moved down on the list of priorities in most classrooms, with many schools completely eliminating it from their educational programs. Faced by ever-growing curriculum requirements, increasing classroom sizes, and budget cuts, many teachers can no longer provide such individual, student-centered tutoring.

Frequently the responsibility is simply transferred to parents and tutors. Many parents, however, feel overwhelmed by the prospect of coaching their children academically - either because their time is limited, or because their own skills are not up to the task. And the challenges are magnified if students have learning disabilities, or if English is their second language.

Research, Reality, and Realization:

eSpindle is a non-profit learning project with 501(c) 3 status, born and nurtured from parents' initiative. www.espindle.org is the result of immense amounts of community effort, contributed by English teachers, writers, editors and sponsors who felt inspired by the prospect of creating an effective alternative to the traditional spelling word list.

With their support, eSpindle Learning compiled and edited an extensive 95,000 word database resource, developed an innovative online tutoring model and tested the application extensively with various age groups.

Rooted in current research eSpindle developed cutting-edge, patent pending technology, infused it with old-fashioned common sense, and added generous helpings of the most important ingredient: The inspiration of parents and educators wanting to create true value for their children and an innovative tool for improvement.

#1 - Teach to all learning styles

Research Learners are commonly classified into three primary learning styles: Visual, auditory, and kinesthetic. Most of us, however, learn best through a combination of these three channels.

Reality Most learning concepts favor the visual learner, since addressing all three learning styles typically proves too time consuming and impractical for most traditional learning environments. Especially the kinesthetic learner (the one that needs hands-on activity to effectively memorize new content) is disadvantaged, because opportunities to actually practice new content hands-on is rarely provided.

Realization eSpindle tutors students via all three major learning methods:

- * An unusually large (72 point) type size for word entry and an uncluttered quiz design assist visual memory.
- * Replayable audio files support auditory learning.
- * Interactive, hands-on process of keying in words benefits the kinesthetic learner much more than a simple mouse-click or a checkmark on a paper test.

For words to be truly put into action, they must first be internalized by sight, sound, and meaning: The very three modes by which eSpindle provides memory-based learning for students.

#2 - We absorb the interesting and useful

Research The brain, bombarded with information at all times, has one simple rule for learning: It will learn what it perceives as relevant.

Only content that is perceived as meaningful and interesting will be memorized effectively. Even content that was "crammed" into short term memory to pass tests will soon after be forgotten if the motivation of the individual does not support memorization.

Reality The traditional classroom operates on clearly defined standards rather than the individual needs of the student. Struggling learners will be left feeling "behind" and are likely to resign to "not liking school" rather than being inspired to embrace the content provided.

On the other side of the spectrum, the advanced student may soon perceive the lessons presented in the classroom as boring and go through school under-challenged.

Realization At eSpindle everything evolves around the individual. This online spelling tutor,

- * creates custom quizzes based on the student's personal learning profile,
- * allows for inclusion of priority words and word lists,
- * checks in with the students (and their caregivers) via email if there is no activity over a long time period,
- * tailors quizzes to the learner's goals.

Students who want to compete in (and, ideally, win!) the Spelling Bee simply choose that option in their preferences. The program will then quiz them on nearly 25,000 typical Spelling Bee words, beginning with common ones and gradually guiding them to more obscure ones.

Likewise, students who want to catch up to their grade level, learn English as a second language, develop a college-level vocabulary, or master the most commonly misspelled words simply adjust their preferences accordingly to receive custom tutoring.

Regardless of the area of interest, eSpindle combines most words with simple, straightforward definitions/hints and sample sentences, to allow for easy conversion of mere "spelling-list" words into active, working vocabulary.

Direct links to word-related online resources like dictionaries and encyclopedias allow further exploration at the click of a button, making curiosity easy to satisfy.

Research shows that students require six to ten exposures to learn a word through incidental contact during reading. They only require two exposures, however, when the word's meaning(s) are addressed prior to reading the word in context (Baker, et al.). Introducing words with complementary information provides the brain with the tools to anchor the word into long-term memory.

#3 - Build on what is already learned

Research Effective learning requires individualized attention that carefully takes the learner from level to level, building efficient progress on a solid foundation.

Reality Unfortunately, traditional classrooms and the common modular learning units only focus on the current tasks at hand and are very limited in their ability to accommodate a learner that has a learning base that is different from the majority of the group.

Realization eSpindle's proprietary 95,000 word database was carefully developed to provide a universal learning foundation. Instead of receiving limited, modular instruction the students log into a complete database and receive exactly the instruction they need to take the next step in their learning journey.

The eSpindle database groups words into various grade levels and sublevels, reflecting their difficulty and usage frequency.

Students proceed from their current level towards proficiency with ease and in small, meaningful steps. eSpindle gradually guides students to higher levels of difficulty and complexity, always keeping track of what a student knows and doesn't know. eSpindle is able to accommodate the full range of learners, from 3rd grade to adult, and will always create appropriate, meaningful, and challenging quizzes.

A word that is not yet mastered will not "fall through the cracks", but will be managed and repeated by the tutoring program until it is reliably mastered.

Just like a spindle spinning strands of wool into strong, durable thread, eSpindle turns wide-ranging, unorganized pieces of information into solid & reliable knowledge.



That first "e" in eSpindle means more than just **electronic**. It also stands for **engaging, enlightening, energizing, entertaining, and easy!**

#4 - Keep It Simple!

Research The most frequent answer a good speller will give when asked why a certain spelling was chosen is "It just looks right."

This "right look" is known in the world of science as an MOI (a mental orthographic image) that is stored in memory.

Reality All too frequently spelling is taught by presenting the learner with a multitude of misspellings, from which the right solution should be chosen .

The brain, however, forms MOIs every time it looks at a word, regardless of the "right" or "wrong" labeling attached to it.

Effective spelling instruction should focus on the correct spelling, not litter the MOI landscape by introducing confusing information.

Realization eSpindle Learning has structured the learning process into easy and uncluttered steps, focusing the student's mind on successfully learning one word at a time. If a student misspells a word, it is immediately erased from the screen, so as to not further enforce it.

eSpindle quizzes offer the spelling words in oversized 72 pt. font size to enhance the visual formation of MOIs.

The quizzes were designed to be speedy, without elaborate, distracting and time consuming gimmicks so often found in educational software.

eSpindle uses simple, straightforward descriptions and sample sentences to supplement the quiz audio. Absorption of the word's meaning is made as easy as possible.

In addition, direct links to extensive online resources (including Merriam-Webster OnLine and Wikipedia Encyclopedia) are provided.



What we hope ever
to do with ease,
we must learn first
to do with diligence.

Samuel Johnson (1709-1784),
English poet, critic,
lexicographer, creator of first
English dictionary.

#5 - Carefully time repetitions

Research Two approaches facilitate long-term learning: "(1) through rehearsal or repetition, or (2) through associations or relations among various pieces of information" (Gredler 1992).

"Spelling instruction ... is most effective when the instruction is performance based, that is, when it targets an individual student's specific deficits in word study knowledge." (*Spelling Performance Evaluation for Language and Literacy*, summarizing a study of Wilson, Rupley & Rodriguez, 1999)

Contrary to common belief, spelling has been found to be a learned skill and not an inherent aptitude.

While some children seem to be very talented in forming MOIs, all children can be taught to be qualified spellers with the proper technique.

Reality On the final pages of this document we will compare traditional spelling word lists with the eSpindle way of learning.

The key to mastering repetitive learning tasks, like learning how to spell, is a well-managed tutoring program that provides sufficient repetition in the proper intervals. Parents and teachers often do not have the resources and time to truly manage this process in the way it would be desirable.

Realization While parents/teachers and students are likely to find repetition-based learning burdensome, frustrating and dull, carefully timed repetitions are a simple task for eSpindle's powerful database software.

The system automatically maintains a list of each student's "Practice Words" and repeats these words in future quizzes. Once the student has correctly entered a misspelled word over three consecutive quizzes, eSpindle updates the list, removing the newly mastered word.

In every case,
the remedy is
to take action.
Get clear about
exactly what it is
that you need to learn
and exactly what
you need to do
to learn it.

Miguel de Cervantes, Spanish
writer & dramatist.

#6 - Test-study vs. Study-test approach

Research To maximize learning, the brain needs to be presented with interesting, challenging content. Unnecessary repetitions hurt motivation and interest - learning results decrease.

In addition, every time an unnecessary learning task is given to the student, precious time is wasted that could be used for systematic and targeted practice.

Already in the first part of the 20th century research proved that studying via a test-study approach is much more efficient and effective than the common practice of study-test methodologies. In the study-test approach, students are first introduced to a set of words, often grouped in a certain fashion. While this trains the short-term memory, it does not ensure that words are reliably learned and will be ready for recall outside of the grouped setting: A lot of time is spent for a relatively small return in long-term knowledge.

With the test-study approach, words that don't need further study are eliminated through active assessment. Energy and time is then focused on filling the personal skill gaps.

Reality Students, parents and teachers alike moan at the thought of spelling word lists. Not only are they time consuming and dull, but it has been shown that most students will already know as many as 75% of the words on the list, but will still be obliged to spend their time and attention "studying" them. This is not intentional, but a problem caused by lack of management and organization.

Realization eSpindle ensures that students are not subjected to the "busy work" of needlessly keying in words they already know. Words typed in correctly will not be quizzed again, as are words that are classified as "easy" by using the skip function in the quiz.

This simple database step (an impossible feat in a traditional classroom setting) ensures that students get the most out of time and learning effort invested during their visits to eSpindle.

eSpindle is able to maintain a personal test-study profile like no other learning program; always working to fill in the skill gaps. In addition, it is not modular like all other learning programs that offer only a limited set of words at a time. A learning profile created in eSpindle will grow with the learner long into the future, and accommodate the student through various levels and personal goals.

#7 - Keep motivation high

Research While many of the factors already described contribute to high motivation, it is in particular individual attention that fuels motivation and keeps the student inspired to follow their path of learning.

If feedback is given instantaneously it will be a much more powerful tool in enhancing the learning process.

Reality In traditional classrooms only a limited amount of time can be spent with each student. In the interim, students need to stay motivated and organized on their own.

Feedback on their work is available only sporadically and frequently with long delays, which limits its ability to be an effective learning tool.

Realization Learning over an extended period of time can be tiring, so students need regular motivation boosters.

This need has been integrated into eSpindle at various levels:

- * eSpindle gives feedback instantly and documents progress clearly in always up-to-date progress reports.
- * In its sample sentences eSpindle will frequently offer quotations that share a positive outlook on learning and self-development, and in turn inspire and amuse students.
- * Users on fast Internet connections hear varying feedback sounds whenever they key in a word correctly. As simple as this incentive is, our comparative testing showed that students study 2.2 times longer on average when that feature is turned on, because they want to do "just one more" word and hear the next sound.
- * Words that are easily confused or commonly misspelled are commented on by *Shirley Brainy*, eSpindle's virtual tutor. This resolves potential misunderstandings and increases learning satisfaction.
- * Reminder emails invite distracted students back into the program (copies may also be sent to caregivers).

Live as if you were to die tomorrow.
Learn as if you were to live forever.

Gandhi (1869-1948), Indian spiritual and political leader, called Mahatma - "great soul".

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- Wide-ranging word lists: With its 95,000-word database, eSpindle offers real variety - and real learning - to students on each test. Students can study the words provided for their skill level and personal goal, or actively upload "priority words".
 - Mastered words will not be repeated on subsequent tests. On the other hand, students will realize which words they still need to work on. In other words, eSpindle replaces the typical study-test approach with a more dynamic test-study approach.
 - Misspelled words are repeated in subsequent quizzes until the student has entered them correctly 3 times over various quizzes. This provides a more reliable measure of long-term retention than simple testing.
 - Appropriate for multiple learning styles: Students can listen to the related audio files (i.e., word pronunciation, samples sentences) as many times as they need to in order to fully absorb a word's spelling and meaning. eSpindle will never grow impatient or make the student feel bad!
 - Advanced-level students can proceed to a quiz level that is appropriate for them, and that addresses their particular goals - maybe winning the Spelling Bee or mastering the English language's most commonly misspelled words.
 - No cramming for tests, and no final exam: Since eSpindle adapts to and keeps track of the individual's progress, learning is a continuous and ever-intriguing experience - genuine learning for life.
 - Providing unlimited access, eSpindle is an ideal tool for students that want to improve but don't have live tutors available to them.
 - At any time, parents and teachers can log onto the eSpindle site to review a student's progress, see which words have been mastered and which need more work. These performance reports can effectively replace time-consuming tests.
 - Students commit to a specific study plan and email invitations are sent to members (and, if desired, their caretakers) if they don't log in at the desired interval.
- Limited word lists: Most students will already know as many as 75% of the list, but will still be obliged to spend their time and attention "studying" them.
 - Top students will possibly know all the words already, receiving neither the benefit of an enlarged vocabulary nor the mental stimulation that derived from a challenge.
 - Less proficient spellers, including those not fluent in English, or those with a learning disability, may lag behind their peers and be in need of more tutoring - a need that, due to issues of school time and financial resources, might go unmet.
 - The "cramming" effect: Students will typically study their word lists on the morning of a test, so their test scores will reflect only the power of their short-term memories, instead of actual comprehension and retention. Administer a "surprise test" on the same list a few days or weeks later, and the scores will probably show that many of the words' spellings and meanings have indeed faded from students' memories.
 - Students need live interaction/audio feedback to memorize the words, which may not be available to them if their parents don't have time or are not proficient in English.
- In sum, a minimal level of new learning is the return on the investment of considerable time, money, and other resources on the part of students and teachers/parents.

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<http://www.espindle.com/general/literacyfacts.php>

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