



## Hardwired for Writing: The Intelligence of the Hand

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It's not hard to imagine a future where keyboarding replaces handwriting altogether. Keyboarding, with its helpful cut-and-paste, deleting, and spellcheck, allows thoughts to be revised and refined easily, a technological marvel that many writers—particularly those of us who remember manual typewriters—hail right up there with sliced bread. But does that mean that handwriting, and cursive in particular, is antiquated and superfluous? With the media buzzing over recent news that Common Core Standards, which guide curriculum choices for school districts nationwide, no longer require the teaching of cursive writing, a lot of attention in educational circles has focused on how the physical act of writing affects cognitive development.

What is the difference between handwriting and typing, and how does each impact learning and memory? Surprisingly little research has been done on this topic, considering how eager everyone is to jump on the bandwagon of educational technology, but a few studies have turned up results that won't surprise anyone whose first inclination is to grab a pen and paper rather than an electronic device.

In one of the most comprehensive works, a team of researchers from Norway and France, Anne Mangen and Jean-Luc Velay, identified significant differences between handwriting and keyboarding. They noted that the writer is much more physically connected with the act of handwriting, where all the attention is focused on the tip of the pen and the effort of graphically forming the letters. In keyboarding, the writer's attention is continually shifting between the keyboard (where the physical act of writing takes place) and the screen. This divided focus is particularly evident in those who are not yet fluent at touch typing (a group that includes most children). The researchers cited a study that noted as writers become fluent with the physical act of handwriting, writing itself flows like a "kinetic melody," a free pathway between the mind and the hand. Musicians recognize this feeling of muscle memory, when the fingers are playing the music by themselves, seemingly without effort from the brain.

Handwriting quickly becomes imprinted into muscle memory, flowing from the thought of the word directly to the page without the writer having to stop and think about the formation of each letter. Keyboarding can also become an automatic process, yet the difference between keyboarding and handwriting is dramatic: with keyboarding, most writers continuously interrupt their thoughts in order to backtrack and make typographical corrections. Our fingers are not so well-trained to type that mistakes are eliminated. Each key feels the same as the next, so we miss sensory feedback about whether or not we "formed" a letter or word correctly. The

disparity between visual feedback on the screen and what we meant to type causes us to stop and self-correct. The result is that typing often develops a disjointed, stop-start pattern. In contrast, handwriting—and cursive writing in particular—flows without interruption as long as words are flowing from our brains. True, handwriting mistakes happen, but “typos” are generally made much less often. With handwriting, the connection between our actions and our intentions seems stronger.

Donald Graves, a noted expert on writing research, agrees that the flowing process of handwriting allows a more uninterrupted connection of the writer’s thoughts. Toronto psychiatrist and neuroplasticity expert Dr. Norman Doidge poses that if cursive falls by the wayside, so will the cognitive skills that handwriting builds. Cursive requires the writer to form each letter and connect it to the next in a different way with each word, which presents a greater challenge to the brain than typing. Doidge believes that the unique demands of cursive bear a striking resemblance to how we form letters and sounds into words in our thoughts and speech as well as how our eyes distinguish words on a page. He and other neuroscientists believe that as children learn to write cursive, they often become more fluent in speaking and reading as well.

Some people consider typing to be more efficient than writing, but is it? If your goal is to record something that can be retrieved, shared, and altered easily, typing is probably your best bet, but if your goal is to remember or learn, handwriting may be the most efficient process. Writing things down helps many of us remember them better. As one blogger put it: “When I type, I type very fast and thus do not think, my fingers are working but not my brain. ...When I get up from the computer, anything I wrote is forgotten. But when I write, even a shopping list, I retain that information. It is similar to writing on the paper and at the same time, writing on my brain cells.” Both visual and kinesthetic learners—and an estimated 70-80% of the population fall into this category—make the connection between writing and remembering. In fact, Stanford University’s Guidelines for Note Taking states that “Notes inscribe information kinesthetically” and “Notes trigger memories of lecture/reading.” These guidelines do not make the distinction between handwriting and typing notes, but they make it clear that writing itself aids memory.

There is evidence that the physical act of inscribing letters graphically (as opposed to tapping homogenous keys) makes it easier to create a clear picture in the mind (i.e. remember). In addition, Dr. Jason Barton, a neurologist and Canada Research Chair at the University of British Columbia, believes that we recognize handwriting much like we recognize faces. If the handwriting is familiar, Barton says it activates a memory trace, “bringing back emotions, knowledge, all the different facets of information and experiences with that person stored from the past.” It seems reading handwriting may have as many benefits as writing by hand. Handwriting might be a learned behavior but it feels hardwired, reaching deep inside us.

Let us not forget what handwriting reveals about the writer, yet another aspect of handwriting that keyboarding will never replace. Typing and texting might be filled with emoticons, but even with expressive fonts, type size, and colors, how much can uniform, typed characters say about the character writing them? Handwriting shows the writer’s personality and mood in a completely unique way. Why do people save all those handwritten notes from children, paramours, best buddies, and relatives long dead? Handwriting reaches inside us in a way typed words on a page never could.

While it seems certain that handwriting itself will never be replaced entirely by keyboarding—imagine putting a typed note on a loved one's pillow—cursive seems a more endangered species. However, even if schools choose to ignore research that points to links between cursive writing and overall fluency, one obstacle to extinction remains: Are we willing to exclude our children from the wealth of handwritten history? Can you imagine not being able to read the postcard your friend sent from Egypt, or the letter Great-grandpa wrote home from the war? Can you imagine not being able to read the original founding documents of our country, or the dusty journal found in your mother's attic? Are these handwritten treasures destined to become as incomprehensible as an unknown language?

Writing has always been and will always be a vital link between human beings. Aside from the cognitive benefits, writing something by hand has its own charm. It's easy to forget that while caught up in the wonders of modern technology, but all you have to do is open the mailbox to find a handwritten note from a friend to be reminded again. Sit down and take a few minutes to write a letter—it won't just make someone else's day, it'll make yours.

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