

The Role of Cursive Writing in Education

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Introduction

The preamble to the U.S. Constitution opens with the words “We the People” in a flourish of steady, flowing, elegant cursive writing. Will future generations of Americans be able to read this and many other historical manuscripts in years to come?

Writing by hand, let alone cursive writing, is slowly disappearing and with that the possibility of reading cursive writing. What is lost when printing replaces handwriting? This question prompts many questions related to cursive writing:

- What are the benefits of cursive writing beyond the possibility of being able to read it?
- What is the relationship between cursive writing and brain development?
- How important is cursive writing to child development?
- What are the benefits beside the ability to write?
- Is teaching cursive writing still relevant in the 21st century?

- Does cursive writing improve our memory?
- Are there disadvantages to writing cursive?

A host of studies and articles related to these questions have appeared during the past quarter-century, even after the federal Common Core State Standards (CCSS), published in 2010, recommended letting go of cursive writing and giving more time to teach keyboarding. However, since then, virtually half of the state governments have reinstated this practice in their curriculum. Why did they do this?

Cursive Writing and Brain Development

What is the relationship between cursive writing and brain development? Over the past several years, many articles and research papers have drawn attention to the link between cursive writing and brain development. In one of the most elaborate research projects on this subject, three authors document which parts of

the brain are activated by writing. They also describe the difference between writing by hand and typing in relation to brain activity:

These results add to growing evidence that writing, either copying or tracing, leads to significantly more activation in the brain network associated with letter perception and reading than does typing, or no practice. Thus, writing seems crucial for establishing brain systems used during letter perception and, by extension, reading acquisition; typing may not be an advisable accommodation for students who struggle with handwriting in the early grades and who need handwriting instruction.¹

Through this research it becomes clear that there is a relationship between brain activity and writing by hand, but it goes even further: it demonstrates there is also a relationship between writing by hand and the process of reading.

The act of writing a letter enhances the perception of letter forms, as shown by activation of both premotor and fusiform cortex, which supports reading acquisition.²

In another extensive brain research project, it becomes clear that in several areas of the brain cursive writing produces more brain activity than does typing.³ This research inspired several other researchers to investigate this activity further. One of them concluded their research by stating:

Handwriting but not typing leads to widespread connectivity in the brain. As increased connectivity in the brain was observed only when writing by hand and not when simply pressing keys on the keyboard, our findings can be taken as evidence that handwriting promotes learning. Interestingly, the increased connectivity between the various brain regions seems to be linked to the specific sensorimotor processes that are so typical in handwriting.⁴

In a related study, the writers present neuroimaging

studies performed to identify the neural network involved in handwriting. These studies suggest that the mastery of handwriting is based on the involvement of a network of brain structures whose involvement and inter-connection are specific to writing alphabet characters. “These skills are also the basis for the development of more complex language activities involving orthographic knowledge and composition of text.”⁵ This research not only shows that handwriting is a great benefit in motor development, but it also demonstrates that in writing by hand we activate several other language skills. The researchers show some interesting brain pictures in which one can see which parts of the brain are specifically activated — specifically how the dorsal part of the premotor cortex, together with two other brain regions involved in phonological processing, is more strongly activated when producing letters than digits. They conclude that, “contrary to a popular belief, handwriting is not just a motor- or movement skill, it also involves written language at the letter form level.”⁶

It is encouraging how much brain research has been done so far on this particular subject. The results are promising and they support the importance of keeping cursive writing in the curriculum for elementary school students.

All of these articles stress the importance of constant and continued “training.” Practice in writing is really necessary in order to activate all regions in the brain; however, this advice is not always taken seriously in the classroom setting. As a result, students don’t get enough time to fully master cursive writing.

Several other researchers have documented the difference in brain activity between writing by hand versus typing. Their conclusion:

Our work clearly demonstrates that the easiness of the motor program associated with typing on digital devices does not facilitate written language acquisition compared with handwriting training. In none of the test tasks, children of the typing training group showed superior letter recognition, reading, or writing performance compared with children who received writing training based on handwriting. Most importantly, we found that children of the handwriting training group performed better than those of the typing group, particularly

1 K. H. James, R. J. Jao, & V. Berninger, “The Development of Multi-Levelled Writing Systems of the Brain,” in *Handbook of Writing Research* (New York: Guilford, 2014), pp. 11-12.

2 Ibid., p. 19.

3 E. Ose Askvik et al, “The Importance of Cursive Handwriting over Typewriting for Learning in the Classroom: A High-Density EEG Study of 12-Year-Old Children and Young Adults,” in *Frontiers in Psychology*, Volume 11, July 27, 2020.

4 R. Van der Weel and A. Van der Meer. “Handwriting But Not Typewriting Leads to Widespread Brain Connectivity: A High-Density EEG Study with Implications for the Classroom,” in *Frontiers in Psychology*, Volume 14, 2023. These authors conducted an earlier study in 2017 under the title, “Only three fingers write, but the whole brain works: A high-density EEG study showing advantages of drawing over typing for learning,” *Frontiers in Psychology*, Volume 8, 2017.

5 M. Longcamp, L. Richards Todd, J.-L. Velay, & V. Berninger, “Neuroanatomy of Handwriting and Related Reading and Writing Skills in Adults and Children with and without Learning Disabilities,” in *French-American Connections*, Dec. 2016, 171-172:3175.

6 Ibid.

in tasks involving reading and writing at the word level.⁷

It is important to notice that the researchers stress that “superior writing performances after handwriting training can only be obtained when training is sufficiently long to establish enduring sensory-motor memory traces.”⁸

Cursive Writing and Pencil Grip

What is the “right” pencil grip? When we observe children (also adults), it is amazing how many different pencil grips they exhibit. Which can we identify as being a “good one”?

For a start, we need to know that little children cannot yet move their wrists in a flexible manner, and as a result they tend to hold a writing instrument in awkward positions. Jan McCleskey, who has extensively studied the ways in which young children come to grasp a pencil, writes:

The optimal grasp pattern for good manipulative skills has good separation between the two sides of the hand with the thumb, index and third fingers providing dynamic movement to control the tool, and the 4th and 5th fingers providing stability of the hand. Movement of the pencil requires the ability to isolate and grade individual finger and thumb movements (Case-Smith 1995). Separation between the two sides of the hand for manipulative skills occurs around age four. Finger excursion while using a writing instrument occurs around 5-6, if a child uses a tripod grasp pattern. It involves dynamically moving the thumb, index and third fingers as a group to move forward and backwards in the vertical plane, and sideways in the horizontal plane. To achieve finger excursion, a child must flex/extend the thumb, index, and 3rd finger IP joints.⁹

The protocol of a functional grasp pattern appears as follows:

- 4th, 5th fingers tucked in palm (ulnar stabilization)
- The pencil should rest on the lateral (radial) edge of the index MCP (metacarpophalangeal joint, also

known as “knuckle”) joint

- Wrist slightly elevated to 30 degrees
- Prehension between index and thumb with support from medial edge of the 3rd finger (radial manipulation)
- Rounding of the thumb web space
- Flexion of the thumb interphalangeal joint and the index and third PIP and DIP joints
- Wrist stability
- Forearm stability

In an earlier paper, McCleskey describes eight types of grasp patterns predominant in children and adults. She gives several very useful ideas how to remediate the pencil grip.

It is important for teachers in early childhood and elementary school to know the developmental stages of the grasp patterns. McCleskey describes them in meticulous detail:

Development of fine motor skills are important for kindergarten readiness! By understanding the development of grasp patterns, therapists, preschool teachers, parents, and kindergarten teachers can prepare a child for writing. The developmental characteristics of grasp development are as follows:

- Forearm/ wrist stability - developmentally comes about age 4 during coloring, with refinement around age 5.
- Tripod grasp - the child experiments with many grasp patterns prior to age 4. By age 3.5 to 4, therapists should be encouraging a tripod grasp on a pencil for all students. This is the window of opportunity where a child develops a kinesthetic awareness of a grasp on a pencil through practicing coloring and drawing. Learning a correct grasp later is much more difficult than learning a correct grasp initially.
- Radial manipulation/ulnar stabilization - begins to develop around age 4.5 and becomes more refined around age 5 to 5.5. Manipulative grasp continues to develop, with additional increase in coordination for several years as finger excursion matures.
- Finger excursion - the ability to point and bend the IP joint (Interphalangeal joint, the thumb has one and the other fingers have two) of the thumb for dynamic control during writing or

7 M. Kiefer et al, “Handwriting or Typing: The Influence of Pen- or Keyboard-Based Writing Training on Reading and Writing Performance in Preschool Children,” in *Advances in Cognitive Psychology*, Dec. 31, 2015; 11(4):136-146.

8 Ibid.

9 Cf. M. Benbow, “Principles and Practices of Teaching Handwriting,” in A. Henderson and C. Pehoski, eds., *Hand Function in the Child* (St. Louis, MO: Mosby), pp. 255-281.

coloring may begin around age 5 but seems to refine around age 6 with coordination. Some children do not develop good finger excursion if they have a non-manipulative grasp.¹⁰

As a Waldorf director of pedagogy, I have had the privilege to observe all our students from parent/toddler groups to the 12th grade. During one of my observations in kindergarten, I noticed how a kindergarten teacher “corrected” the 5½ and 6-year olds’ grasp of their spoon while they were eating their snack. She used a beautiful image to get the students to do this. The children held their spoons in the so-called Palmer-grip, which is normal for little children. She wanted them to use the tripod-grip, holding the spoon between thumb and pointer while resting it on the middle finger. In this way the children grew accustomed to using their wrists and the so-called IP joint of the thumb, rather than moving the hand from out of their elbow. This transition is essential for getting the right pencil grip.

There are several reasons why a child may develop a poor pencil grip. McCleskey writes:

As a child develops hand coordination, the intrinsic musculature in the hand strengthens. Children who enjoy drawing and coloring tend to develop strength in the hands and have good stability when holding a pencil. The reason for the development of a poor grasp pattern is often due to the child enjoying writing and coloring at an early age before the hand develops the coordination and proprioceptive awareness of a manipulative grasp.¹¹

Nowadays children in (public) preschool are forced very early—some as young as 2½—to “write” letters and numbers with a pencil. They cannot hold a pencil in the correct way yet, resulting in a poor grasp, which will be hard to correct later on. It is better not to have to “write” any letters or numbers at this age. But if they do, then at least they need to use a crayon stick because they are still engaged more in drawing than in writing at this age.

In his illustrated booklet, *Handwriting in a Modern World: Why It Matters & What to Do About It*, William Van Cleave offers valuable information about the “correct” pencil grip and “paper-position.” He also gives “warm-up” exercises for learning cursive writing. In Waldorf schools we would call them “running form drawings.”

Van Cleave is very specific about the importance of teaching cursive writing: “A significant amount of statistical and empirical research,” he says, “supports the use of cursive writing with students who struggle, particularly those with language-based learning difficulties.” At the end of his article, he advises educators to start teaching cursive writing as early as first grade, especially to help students with dyslexia. He gives four reasons why we should do this:

- The kinesthetic-motor reinforcement of cursive writing is stronger than that of manuscript (lower case letters), and cursive is therefore better for spelling. Skywrite (always with two fingers) the word “the” in print and then in cursive. Feel the difference in your arm as you “write” the letters. Your body actually learns the spelling of the word better in cursive.
- Students who struggle with directionality and starting point will find cursive less difficult and faster. First, in a good lowercase cursive alphabet, all letters begin on the baseline. Students always know where to begin. Second, since letters within words connect, students must only “begin again” once per word, rather than for each new letter.
- Letters sometimes reversed in manuscript (e.g., b/d and m/w) not only look different in cursive but also are formed differently, so cursive decreases the frequency of reversals in writing.
- Thanks to the connected letters in cursive, students with word spacing issues can easily discern where one-word ends, and another begins.¹²

In the 1970s and 1980s I worked as a class teacher at a Dutch Waldorf school. We would send students with learning difficulties to the practice of Dr. Pierre Mesker to solicit some suggestions on how to help these students. It was always inspiring to read his reports. His advice was to start cursive writing as soon as possible in order to help these students with writing language and comprehension. In his book he describes the anatomy of the hand and its development during the first eight years of life. One very interesting part is the description of the connection of the right hand with the left part of the brain and the left hand with the right side

12 W. van Cleave, *Handwriting in a Modern World: Why It Matters & What to Do About It*, privately published by W.V.C.Ed. at www.wvced.com. I was pleased to read this pamphlet because it reminded me of the work of Dr. Pierre Mesker, a neurologist/psychiatrist from Maastricht, The Netherlands. He wrote a very interesting book: *De Menselijke Hand [The Human Hand]*, published by Suyi Publications, 1972. See also the research paper by Ruud van der Weel et al, “Only Three Fingers Write, but the Whole Brain Works” in *Frontiers in Psychology*, Vol. 8, 2017.

10 Ibid.

11 J. McCleskey, “The Influence of Joint Laxity on the Development of Grasp on a Pencil” in *Manual for Handwriting Clinic* (2010). See: “First Strokes Research” in thehandwritingclinic.com.

of the brain. However, the right thumb relates to the right side of the brain and the left thumb with the left side. The consequence is that when we use the correct pencil grip (i.e. tripod grip), we activate both sides of the brain at the same time.

Ever since we worked with Dr. Mesker, we introduced cursive writing in first grade to all students. We didn't introduce manuscript (lower case) anymore, but instead we used what Van Cleave described as "a good lowercase cursive alphabet." All students profited from this, not only the students with learning difficulties. It became clear to all of us that cursive writing helped *all* our students in their development.

To understand the development of the appropriate "grasps," it is worthwhile reading Frank Wilson's celebrated book *The Hand*.¹³ In Chapters 5 and 6 he describes the developmental evolution of the hand and especially the function of the thumbs.

Are There Benefits Beyond Learning the Technical Skill of Cursive Writing?

Several articles already mentioned confirm that there are many more benefits to writing in cursive than simply linking letters. In the words of one team of researchers, "One of the most vexing educational problems in children is the inability to learn to read. Recently it has been shown that the inability to write skillfully imposes great limits on a child's ability to learn to read." They refer to a study done by Richards in 2015, which showed that "writing by hand (cursive) is important for the early recruitment of letter processing in brain regions that are known to underlie successful reading."¹⁴

The researchers studied specifically the so-called RPS (Reversed Positioning Sensation) syndrome. They noticed that children with this syndrome were working with an "inverted" hand position, which put the controlling fingertips under the pencil. Their article describes how to remediate this syndrome and work actively to promote what they call "fluent handwriting" (i.e. cursive writing) as a solution to written language difficulties and illiteracy.

I have already mentioned the work of Virginia Berninger and others from the University of Washington. She described how "children writing by hand was associated with better phenome skills, spelling, and idea expression, compared with typing on a keyboard, indicating a

brain basis for these different disabilities."¹⁵

Berninger has done extensive research on this topic for the past fifteen years. In a research paper entitled "The Development of Multi-Leveled Writing Brain Systems: Brain Lessons for Writing Instruction," she writes:

Lesson 1: It is important to teach handwriting, beginning in early childhood and continuing through middle childhood, with attention to both the motor and letter coding processes involved, and integrating handwriting with reading, spelling, and composing.¹⁶

In many of the research papers I have read, the researchers conclude that writing by hand, especially cursive writing, stimulates several areas in the brain connected with spelling, comprehension, syntax, composition, memory, and reading. William Van Cleave, for instance, in the article cited earlier, gives many reasons why cursive writing is still very important for acquiring language skills in children. These considerations alone are grounds enough to keep cursive writing in the elementary grades curriculum.

In an article entitled "The Power of Touch is Vital for Both Reading and Writing," Naomi S. Baron (Professor Emerita of Linguistics, American University) quotes comments by some of her students who participated in her research (using paper and a writing instrument):

- "I can see what I'm thinking."
- "I feel more attached to the content I produce."
- "The satisfaction of a whole page filled by handwriting; it feels like I climbed a mountain."¹⁷

There have been so many articles coming out recently about the importance of cursive writing amidst pleas to reinstate it in the school curriculum. Just recently I received one by Lucinda McKnight and Maria Nicholas from Deakin University in Canada, with the enticing title, "Five Reasons Kids Still Need to Learn Handwriting (No, AI has Not Made It Redundant)". I will just list the five reasons, but it is worth reading what they have to say about each of them:

1. *It develops fine motor skills.*
2. *It helps you remember.*
3. *It's good for your wellbeing.*

13 F. Wilson, *The Hand: How Its Use Shapes the Brain, Language, and Human Culture* (New York: Pantheon Books, 1998).

14 R. A. Young, R.V. Rose, & R. Nelson. "Teaching Fluent Handwriting Remediates Many Reading-Related Disabilities," in *Creative Education*, Vol. 6, No.16 (September 2015).

15 V. Berninger & W. Winn, "Implications of Advancements in Brain Research and Technology for Writing Development, Writing Instruction, and Educational Evolution," in *Journal of School Psychology* 34 (2012-2013), pp. 23-52.

16 Ibid.

17 N. Baron, "The Power of Touch is Vital for Both Reading and Writing," in *The Conversation*, May 1, 2024. theconversation.com.

4. *It's very accessible.*
5. *It's about developing your thinking.*¹⁸

Hetty Roessingh (Professor at the Werklund School of Education at the University of Calgary, Canada) also wrote an article in non-profit media outlet, *The Conversation*, entitled “Why Cursive Handwriting Needs to Make a School Comeback.” She states, “Handwriting is also an elegant testimony to the human capacity for written literacy and an inspiring symbol of the unique power of the human voice.” In response to the commonly-heard complaint, “*It's too difficult to write in cursive!*” she says, “Handwriting is only difficult if it is not automatic and, in turn, offloaded into long-term memory. Evolving research in the neurosciences underscores the importance of developing automatic skills in relation to what educational psychologists call the cognitive load.”¹⁹

More recently, Roessingh summed up her research by saying:

Good Handwriting is not an end in itself. Rather, it is a means to literacy that fundamentally transforms the human experience.²⁰

It is becoming clear to many states in the U.S. (also in Canada) that reinstating cursive writing in the school curriculum is crucial for several aspects of the language development in children. At least 25 states—most recently California and New Hampshire—are already listed, and five states have legislation pending.²¹

Are There Disadvantages to Learning Cursive Writing?

From my own experiences as a teacher, and having read many research papers on cursive writing over the past 20 years, I would say: No, there are no disadvantages. The only challenge one could cite is that learning cursive writing requires practice, and practice requires sufficient time to master this skill. To give our students

adequate time to learn cursive writing, we need to incorporate it into the curriculum from the first until the middle grades of elementary school.

As for the adults – we, too, benefit from practicing this skill, if only to enjoy the beauty of it!

Conclusion

This research has kept me busy for the past two years. I have always been fascinated by cursive handwriting. It is so personal and characteristic. Reading a handwritten note feels like truly connecting with a real person, something an email doesn't do.

I have read multiple research papers and articles about the importance of cursive writing, and they have given me even greater respect for this skill. The focus Rudolf Steiner placed on introducing writing before learning to read has proved to be fundamentally important for literacy development in children. He gave us a Waldorf curriculum for the developing human being. Experiencing and working with this gift makes one realize how remarkable his work is. Cursive writing is still important—perhaps now more than ever—for the developing human being of today. It inspires much gratitude for Steiner's work (in Spiritual Science) and the gift he gave us more than 100 years ago. He was truly ahead of his time!

After Common Core of 2010 became the standard for our schools and cursive writing made way for learning to keyboard at a very young age, many educational professionals began to realize that this was not a good move. Since then many researchers have identified what has been lost and what the benefits of writing by hand and cursive writing can do for the development of the brain.

As I was completing this research project I came across Hetty Roessingh's article in *The Conversation*, already cited.²² Under the heading “Joey Votto's Handwritten Apology to Baseball Fans Shows the Pen is Mightier than the Bat,” she recounts the story of the celebrated Canadian-American baseball player who wrote a three-page handwritten letter to all his Canadian fans, apologizing for remarks he had made in 2018. He posted his letter on X (formerly Twitter) in cursive. Within 24 hours of posting it, he had received almost two million views. Roessingh comments: “The fact that Votto chose to write the letter in cursive makes the apology that much more authentic: had he typed it out, readers could have assumed that someone else or a computer program chose the words. But the handwritten

18 L. McKnight & M. Nicholas, “Five Reasons Kids Still Need to Learn Handwriting (No, AI has Not Made It Redundant),” in *The Conversation*, June 6, 2023, theconversation.com.

19 H. Roessingh, “Why Cursive Handwriting Needs to Make a School Comeback,” in *The Conversation*, August 22, 2019, theconversation.com.

20 H. Roessingh, “Teaching Cursive Handwriting to Young Children? Here's How They Learn, and Resources for Instruction,” in *The Conversation*, March 24, 2024, theconversation.com.

21 The list is regularly updated at the website mycursive.com, which tracks cursive writing requirements nationwide. Another source for updates is NPR, which carried an article on May 11, 2024 by Jonathan Lambert on “Why Writing by Hand Beats Typing for Thinking and Learning.” Basically, he summarizes much of what I have researched, and he even used several of the research papers I mentioned in this article. His is a good article for teachers to use in their parent evenings when they discuss with their parents the importance of cursive handwriting.

22 Cf. footnote 20.

note clearly shows Votto's emotional commitment to the apology – including some grammatical errors that a computer would have corrected."

After reading this article, I would like to say: Let us keep the instruction of cursive writing in our school curriculum and make sure our students get enough practice time to learn this beautiful skill. And, as adults, let's take up the old fountain pen and write some nice cards to our friends and family.

The last word, though, goes to Malala Yousafzai, the youngest ever Nobel Peace Prize laureate. She reminds us:

One child, one teacher, one book and one pen can change the world.²³

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23 M. Yousafzai, *Malala's Magic Pencil* (New York: Little Brown and Co., 2018).