

**First Person**

## **How Computers Change the Writing Process for People with Learning Disabilities**

By: Richard Wanderman

I'm a successful adult with a learning disability (dyslexia); part of the reason for my success is that I use computers to organize and express my ideas. In this article I focus on writing because it's the part of computing that has had the biggest impact on me. In fact, if I didn't write with a computer I wouldn't be able to share this article with you because I wouldn't be able to record, work with, and share my ideas and I wouldn't know from personal experience how doing these things with a computer changes the writing process for people like me.

People with learning disabilities like dyslexia don't do enough writing to learn from their own experience with writing. I never did. When we do write with pen and paper, it's so difficult that we do it awkwardly, if at all, and we don't enjoy it. So we avoid it and of course, don't improve from lack of practice.

Without a computer, composing and printing are wed. This means that there is no temporal or mechanical separation between recording ideas, working with them to get them right, and printing to save and share them. The recording process is permanent (wed to the printing process), which means there is no possibility for change.

One of the many effects this has is that it puts too much pressure on writers to have the entire thought they are trying to express in their heads, (clearly and in the correct order) and as they go to record it, they must get it right the first time. I don't perform well under pressure, and this kind of pressure killed my writing performance. So I never practiced writing, I avoided it.

Practice is important. If I could have gotten enough practice writing with a pen and paper my writing could have improved. But I didn't and it didn't. For me, it took the elimination of dysgraphia through the keyboard, the ability to make changes in my writing, and being able to easily proofread my writing on screen and in print to get me to do enough writing to get some of the positive effects of practice.

The other important aspect of writing that people with writing problems have a hard time experiencing pre-computer is using writing as an extension of memory. When you write, you are moving ideas from your head into or onto a medium that allows you to see them any time you like. Plus, they will remain there, stored, forever.

The problem with pen and paper as a medium for moving ideas from one's head to paper is many fold: handwriting might not be fast or clear enough; the transfer of ideas has to have decent fidelity the first time because the recording process is permanent, and once recorded there is no possibility of change.

Computers allow this recording process (moving from head to whatever medium) to happen more quickly, relieving the pressure to have a decent short term memory. Also, storing information digitally makes the information malleable for later editing and manipulation as your ideas change. And, lastly, using the computer as a digital extension of your memory makes it easier to find things when you want them (providing you set up a decent filing system, which few people actually do).

## How computers change the writing process

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Computers make it easier to get ideas recorded outside of your head. Computers make it easier to edit, change, and work with ideas. Computers make it easier to publish or share ideas.

### Recording information

Keyboarding, even hunting and pecking, eliminates the hand-encoding process that many dyslexics and all dysgraphics find so hard. Being able to make perfectly formed letters by hitting a key is a lot easier than struggling to write by hand.

Touch typing, when mastered, can be a great help for many people with learning disabilities. Encoding via kinesthesia vs. by pen or even by hunting and pecking (finding a letter by recognizing its shape, etc.) is a great way to end-run the spelling pattern memorization problem. When you touch type, you're remembering not the spelling of a word, but a kinesthetic sequence. My spelling has improved tremendously as I've written more and as my touch typing has improved. I still don't know much about spelling rules and I don't know anything about the rules of grammar but I do know a lot about spelling patterns from looking at words, and sentence patterns from looking at sentences.

I realize as I write this that the QWERTY letter arrangement on standard keyboards is meant to slow people down (an old standard that persisted even though there was technological improvement that made it useless) but to me that's not important. The keyboard allows for a different way of encoding language, whatever the key arrangement is.

And there are other ways to get information into computers. One might think of these ways as augmenting the standard keyboarding process:

- Different keyboard arrangements and sizes: Dvorak, large membrane keyboards, one handed keyboards (chording);
- Abbreviation expansion software which allows a user to record a word or phrase and then have the computer type it by only remembering and typing a short abbreviation (rw = Richard Wanderman);
- Word prediction software which augments both spelling and syntax by predicting ahead to help a user make choices, find words, and complete sentences;
- Speech to text where the user speaks into a microphone and specialized software translates that speech into text that is displayed on the screen.

With all of these augmentative tools one still has to think and compose and edit and make choices, but these tools can make the recording of ideas possible where it might not be otherwise. The important point is to get your ideas recorded so you can remember them, work with them, and share them.

### Editing and changing things

Once the writing is in the computer it is being held or "remembered" electronically (instead of in ink on paper) so change is possible. If the only tools we had to change our writing were a movable cursor and delete key, we'd be content and would be able to do much of what we do now. Just being able to change things without a rewrite frees us from worry about making mistakes.

With the ability to change things comes:

- No emphasis on spelling during composition

- Less emphasis on getting the ideas in the right order the first time
- More emphasis on content
- More emphasis on recording ideas, even in crude form

Expanded vocabulary (before computers, dyslexic writers would rarely take a chance on words they used in their spoken vocabulary but didn't know how to spell because they couldn't fix mistakes easily)

This last effect is subtle but an important aspect of writing with a computer. Being able to concentrate on what you are trying to say rather than struggling to get the spelling right, or worse, choosing only words you know how to spell, is where the emphasis ought to be and what electronic editing allows.

For example, I might know quite a bit about a subject and be able to talk about it clearly, using all of the appropriate vocabulary, but when it comes to writing about the same subject, if I can't spell the same words I used in talking about it, I can't share in writing the full complexity of my thinking and knowledge.

Finally, with ease of editing and less fear of mistakes comes less fear of writing and so, more writing. With more writing comes more skill (just from practice, not from direct instruction) and with more skill comes more writing.

Basic text editing with any computer/word processor allows:

- Deleting letters, words, phrases
- Inserting letters, words, phrases
- Moving letters, words, phrases
- Copying letters, words, phrases

These basic electronic capabilities are enough to make computers the greatest tools ever for people with writing problems because they allow for easy change. Again, no more pressure to get it right or have it complete.

But of course, there are more tools that we can use on our writing once it's stored in a computer:

- Search and replace is the ability to find something and replace it with something else. I could search for all instances of "I done it" and replace that phrase with "I did it"
- Spelling checkers are pieces of software, usually built into word processors, that compare each of your words to a long list of words spelled correctly (hopefully) and then, offer suggestions for correct spellings. If these tools did nothing more than proof our writing and flag problem words they would be worthwhile, but of course, they do a lot more. One does have to be able to discriminate the correct suggestion when it is made.
- Synthetic speech is turning the text on the screen into sound by way of a piece of software that does its best to exercise rules of phonics and pronunciation. Just being able to hear your writing read aloud is enough (never mind that the speech synthesizer sounds robotic and screws up some phonemes) to allow some writers to hear problems in their syntax or even spelling where they might not be able to see them.
- Color coding text is a great way for people with reading problems to do the electronic equivalent of using a Hi Liter on their writing. I'm color coding certain phrases in this article to make it easier for me to edit them later.

- Structured writing tools like outliners and semantic web programs allow us to work more easily with ideas that aren't fully developed. Another word for these kinds of tools is brainstorming tools.

These tools don't change the fact that we have to proofread, decide what it is we are trying to say, and say it clearly, but they change the process of working with ideas and allow us to concentrate on the quality of the expression of our ideas instead of the limitations of the tools we have to express them.

Another category I'm not going to cover in this article is reference materials. One could do a number of articles just on reference materials for writing: electronic dictionaries, thesauri, encyclopedias, and more. In short, making these tools, which existed first in book form, electronic changes them in the same way that the keyboard changes the pen. And, because of these essential changes they get used more and with more use comes more learning and ease.

## **Printing and other forms of sharing**

The final part of the writing process changed by computers is sharing the writing with others; publishing it. In the age of the internet and e-mail, print (toner or ink) on paper is becoming less important. But whether the final output is toner on paper or HTML on the web, being able to easily control the way it looks without having to slave over handwriting and re-handwriting is an important change in this part of the writing process.

Just knowing that I won't have to hand-letter this article takes a huge weight off of my shoulders in writing it. As a matter of fact I'm not going to print it at all; I'm sending it to WETA via e-mail which means that all they'll get is raw text. It will be up to them to format it for the web (add HTML tags, etc.). This has allowed me to concentrate on what I want to say, not on how it looks.

But when I want to concentrate on how it looks I can. And the reason for that is that I don't have to manually cut and paste, I don't have to set type, and I can experiment with typefaces and formats to my heart's content and print in each of them without having to commit to any.

Even the least expensive old dot matrix printer is easier to read than handwriting. Now we have ink jet and laser printers that make writing look like it came from a professional printing house. And this is a double-edge idea: the quality of the ideas does not necessarily go up as the clarity of type improves. You can publish a boring, poorly written newsletter that looks great visually.

## **Tools are only one part of the solution...**

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All of these effects together; change in the input process, change in the editing process, and change in the output process make writing much more accessible to students and adults with learning disabilities. The challenge now is convincing schools to rework their curriculums to reflect this change.

I've spent a considerable amount of time traveling and talking with numerous school systems. Amazingly, few really "get it" and are using that knowledge to rework their core curricula. Many are using computers only for the delivery of content, drill and practice, or final editing and printing of writing.

The part of computing that hooked me was being able to explore my own ideas in a way that allowed me to know that my ideas were worth exploring, and being able to share them in a way so that others might think so too.

## **About the Author**

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Richard Wanderman is an internationally known educational technology consultant and teacher, and a frequent contributor to LD OnLine. Richard offers presentations and workshops on learning disabilities and technology, high and low tech tools, ideas to make school easier, post-secondary issues, and motivational talks on growing up with a learning disability for young people and adults. He also maintains

a web site called **Learning Disabilities Resources**.

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[http://www.ldonline.org/firstperson/How\\_Computers\\_Change\\_the\\_Writing\\_Process\\_for\\_People\\_with\\_Learning\\_Disabilities?theme=print](http://www.ldonline.org/firstperson/How_Computers_Change_the_Writing_Process_for_People_with_Learning_Disabilities?theme=print)

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