

Paper and Pen: What the Research Says

Transcript of Podcast Episode 354

Julie Walker: Hello, and welcome to the Arts of Language Podcast with Andrew Pudewa, founder of the Institute for Excellence in Writing or as many like to say, “IEW.” My name is Julie Walker, and I’m honored to serve Andrew and IEW as the chief marketing officer. Our goal is to equip teachers and teaching parents with methods and materials, which will aid them in students to become confident and competent communicators and thinkers.

So Andrew, I don’t know if you know this or not, but before I worked for you, which has been now over fifteen years, I was a Pudewa groupie. I read everything you wrote; I listened to every talk you gave. If you were at our local convention in Southern California, I sat in on your talks. And of course, you know how we all got started and got acquainted: I invited you to come and do workshops for us at Biola University when I was working there.

Andrew Pudewa: Yeah. So I never thought about it this way, but given that, that’s probably why you thought, man, this guy needs some help.

Julie Walker: Well, I don’t know if I invited you to hire me. I think it was the other way around. But you know, I just consider myself like one of the top groupies because now I work for you.

Andrew Pudewa: You would win. Well, next time we have like our company dinner with spoof awards, I’ll give you Top Groupie of the Century.

Julie Walker: There you go. There you go. Well, and the reason I bring that up is I remember when you wrote an article for the CHEA magazine. CHEA is Christian Home Educators Association of California. And you were devastated because they got the title wrong because the title was supposed to be “Convert to Pens,” which is an article you can find on our website and in your book *However Imperfectly*. Only CHEA had it “Convert to Pencils.”

Andrew Pudewa: Oh, no.

Julie Walker: And ... I know; do you remember how devastated you were by that?

Andrew Pudewa: No, I don’t remember it at all.

Julie Walker: It was completely the opposite of what you were trying to communicate, which is it is better for students to, at least with writing, do rough drafts in pen. And you talk about that in the *Structure and Style for Students* video courses that you do, in the *Teaching Writing: Structure and Style*, in all kinds of places.

And actually it’s the fourth point in what we’re going to talk about today, which is “Paper and Pen: What the Research Says,” because you turn that one little article into a whole talk.

Andrew Pudewa: Well, this talk came about almost out of desperation. I was going to a conference; I think it was Memoria Press. And they wanted me to do some kind of talk on technology. And I didn't know what to do. And I collected up all this research, and I put it together. And I thought, this is going to be the most boring talk that I have ever done. And everybody loved it. And I was surprised.

And then I would, you know ... I did it at some other conventions, and I would always start out saying, "I don't know why you're here. Why do you want to hear about this research?" See what people say. But it's a little dated. I'll be honest. There's a lot more research coming out continuously.

Julie Walker: And all this research is supporting your premises.

Andrew Pudewa: Yeah. People look at research. And if it's five years old, then they think, well, that's probably not useful or valid anymore. But some truths are timeless. So if you get research, and it shows something very clearly, well, okay, yeah, you like to replicate that. You'd like to do it again, but it doesn't mean it's not valid just because it's older.

Julie Walker: Right. Yeah. And you can just apply the research that you have to today's technology, which ... There's going to be something that you can apply to today's technology.

Andrew Pudewa: Yeah. Things have actually changed since I first did this probably seven years ago maybe.

Julie Walker: Yes. So you've got four points in this talk.

Andrew Pudewa: Right. Well, the first one is about reading: paper versus screen.

Julie Walker: Oh, okay.

Andrew Pudewa: There's quite a few studies that have been done on that. The second aspect would be writing, and that would be writing on paper versus typing. And since no one types on paper anymore, that's kind of a moot point. But do you remember typing on paper?

Julie Walker: I do. Absolutely.

Andrew Pudewa: Remember when you had to, like, put a sheet of paper in the typewriter and roll it and line it up?

Julie Walker: Yes, Andrew. We're the same age. A hundred percent, I remember this. If you can remember it, I can remember it.

Andrew Pudewa: Seems so ... And I met this little kid at a convention; he's like ten or eleven years old. And he said to me, "Do you have a typewriter?" like it was the coolest thing on earth. And I said, "Well, I have a computer." He goes, "No, I mean a typewriter where you put paper in it." And I thought, why is he so excited about this? But you know, it's antique.

Julie Walker: I think we have a typewriter, Andrew. I think it's a prop in one of our SSS classes. I don't remember which one, but we definitely had a typewriter on the desk.

Andrew Pudewa: And we have absolutely no need to know whether it actually works or not. So writing on paper by hand versus typing. And then there's writing: printing versus cursive.

Julie Walker: Okay, like manuscript versus cursive.

Andrew Pudewa: And then there's writing with a pen versus writing with a pencil. And then I would usually tease people and say, well, if I have enough time, I might even talk about the best kind of pen and why.

Julie Walker: Oh, yes, yes. Well, and you're not going to give this whole talk. We'll put a link in the show notes so that people can find this talk. And if they're interested in all the research, you can ... You'll be able to find this in our show notes.

Andrew Pudewa: Right. And I have the original sources noted in the PowerPoint. So we can give people the PowerPoint.

Julie Walker: Great. Okay. Perfect.

Andrew Pudewa: If so inclined ...

Julie Walker: All right, so Point 1.

Andrew Pudewa: Well, okay, Point 1. Lisa Guernsey of the New America Foundation's Early Childhood Initiative compared parents reading to children using paper books versus e-readers. And that would include a whole category of tablets, Kindles, special devices, blah, blah, blah. And what she noticed is that they interact differently.

So when parents are using a paper book, they would talk about the content, asking the children to make inferences or observations about the story, maybe the artwork. But when they were using a device, most of the conversation ended up being about how to use the device. So it completely changed the experience for the child.

Julie Walker: Well, and Andrew, you know this, and you're going to have to help me remember the name of this. But I just got my grandchildren, for a gift, the Anno books. And so these are picture books. I actually bought them from Beautiful Feet Books. They're a friend of our company – friend. And it's all illustrations, no words. And I just am looking forward to going through page by page, where it's very simple. There's a peasant, and he starts in a village in Italy. And he walks. And as he gets closer to town, there's more and more buildings, more and more structures. And I think the idea is you try to find Anno throughout the book.

Andrew Pudewa: Right. It's kind of like a Where's Waldo, only easier. But I think they are very interesting books to promote conversation. And they are originally by a Japanese artist. And I actually used those books way back when I was living in Japan, '82, '83, '84. So they're that old.

But I would use them for English conversation lessons, which is a great way to make money when you're an American living in Japan. Everybody wants to pay you to talk English with them.

Julie Walker: Oh, nice.

Andrew Pudewa: But what do you talk about? And the books have that wide, wide range of complexity, and they're also just beautiful.

Julie Walker: They're beautiful. Yep.

Andrew Pudewa: They're just beautiful to look at. Another study – this was called “Teaching with Interactive Picture eBooks in Grades K–6,” published in the *Reading Teacher* in May 2013. They found that with interactive e-books or on tablets, it resulted in lower comprehension by students. A few reasons for that. One is that they would skip a whole page or two or more because they're looking for the animation.

These were visually hyperstimulating. And they weren't able to just look at the picture that's there. The author of this, Schugar and Schugar, pointed out that these interactive features were much more distracting than they were value adding. And they also believed that children would just kind of lose the thread of the narrative.

Julie Walker: Oh, because they're looking for the next button to push or the next butterfly to capture. Yeah.

Andrew Pudewa: So you know, that's very interesting because this idea of children's publishing with interactive materials was hugely big at the time. But I actually think that may have decreased and that what we are seeing is more of an emphasis on beautiful books. Or the other side would be books that kind of push a particular agenda on children. That's also very rampant in children's publishing today.

But you don't see as much with older students. Here they found high school and college students actually preferred printed books. So this was their self-declared preference. They admit that e-books are lower cost, more convenient. Carry around a thousand books with Kindle. And they have built-in dictionaries and things.

But ninety-two percent of high school and college students surveyed said that they believe they could concentrate better with a paper book. Other comments included easier to focus; sticks in my head more easily; read more carefully; less eyestrain. And this was research done at American University by Naomi Baron, who is the executive director of the Center for Teaching, Research, and Learning.

Julie Walker: Interesting. So now one of my sons had some visual tracking problems. So reading a whole book was a little bit of a challenge for him. So I did the combination Audible audiobook and the physical book so that he could annotate the book while hearing it. And that just aided him a little bit better with the visual tracking.

Andrew Pudewa: Right. And you know, the huge benefit of that over a device that will do that is that the audiobook is read by a real human being, generally, not always, but generally a human being who reads well and can put nuance in that helps create comprehension, whereas a device can, yes, transpose text into speech, but it doesn't have that, you know ... I guess we're getting on the edge of AI, where it will be very difficult for people to tell the difference between a real human and a artificial intelligence.

But at that time they found that. Another study – this is Anne Mangan. She's a Norwegian researcher. She's kind of one of the, I don't know, big people in this world of literacy, research, and technology. She has many articles published. This one was published in the *International Journal of Education*, 2013.

She found that studying Norwegian tenth graders. A four-page document comparing a PDF on a computer screen versus a text—so that's what we would normally be reading is PDF on a screen—that the paper text had significantly better comprehension. And she speculated that scrolling has a negative effect on concentration.

And I know that I am one of these people who, when I scroll something, I want to get it exactly right at the top and then read down and then scroll the next. And that's just why? I don't know, because I like order, because I grew up reading paper books that always started at the top of the page and not shifting.

But interesting words she used: She said the screen lacks *fixity*, which I thought, well, that'd be a really good word for Scrabble, or Words With Friends – like someone plays *fix*, and then you throw on *i-t-y* and get the triple or something.

But what she said is that when we read, we make mental maps of where ideas are on a page. And you think, okay, you're reading a book. And then something reminds you of something else that was said or something else, and you'll think, well, that was about so many pages back on the lower left side. And the fact that we lock location to concept allows us to go find that concept again, whereas with a continuous scroll, you don't have that same sense of where is this in the whole mess. So that was Mangan. Another research by Mangan – she presented this in 2015. She had a 28-page mystery story: adults reading half with Kindle, half with paperback. And the paper readers scored significantly better on plot reconstruction.

Julie Walker: Oh, interesting. Sure.

Andrew Pudewa: So again, comprehension. And there's some other aspects to that study in terms of how people responded to their level of empathy with the characters or immersion in the story. So self-analyzing. But yeah, I've found that too. In fact, I've found a PDF of something and thought, I just want to print this thing out and read it. It'll just be easier, and paper's cheap, and it's worth it.

Or I get a book that's free from, say, gutenberg.org. And then I start reading it. "No." And just go find someone who has a copy or is making one of these print-on-demand. Did you know

there's a whole market of people who find public domain books, and then they do an Amazon print-on-demand service?

And so you buy the book, and they just make the book and send it to you. And the people who do this, you know, they make a few bucks, and you're getting essentially a facsimile of the old book. But it's public domain. So there's no copyright. And then you can carry it around. You can open it up; you can look at the page numbers at the bottom. Yeah, you can mark in it.

Julie Walker: There you go. There you go. So that's reading on screens versus reading on paper.

Andrew Pudewa: Yeah. And there's a few more studies there that can be seen here with the full talk. Then the next question was typing versus handwriting. And I think this is more important to people and especially people who are working in schools because I would say most teachers, and I'll put this up through grade five, possibly up through grade eight, but certainly upper elementary teachers: They almost universally, instinctively know that it is better for kids to write on paper than to type, but state standards, district standards, whatever, pushing the technology ...

In fact, I was just at a charter school recently, doing an in-service – teachers there, professional development. And I was told that the standardized tests that the fourth graders are required to take must be typed. They have to type their writing sample.

Julie Walker: Oh, wow. A nine-year-old boy typing.

Andrew Pudewa: And so what she said is, we spend so much time trying to teach these kids to type; we don't have a whole lot of time to teach them how to do composition and use grammar well. And I thought, well, you know, that's sad. But here we find that this is one of ... You know how academic journals or literary peer review journals – they often have titles that tell you the whole article, right?

And you're just like, that's convenient. I don't have to read this. I just read the title. Here's the title: "Laptop multitasking hinders classroom learning for both users and nearby peers." This was published in *Computers and Education*, March 2013.

Julie Walker: So what exactly is this about?

Andrew Pudewa: Well, yeah, these are college students. And they're basically saying when someone has a laptop, like in a lecture, right, and they're supposedly taking notes, but they're also checking their email or shopping for a present for their girlfriend or whatever ... And you know how we do that. This multitasking is ... it's like the enemy of life in many ways.

But then we feel, ooh, we can do so much at once. Well, it not only lowered comprehension of the person doing it; it lowered comprehension of the other people who were in view of the person's screen who is doing it.

Julie Walker: They're looking to see what you're buying for your girlfriend and wanting to get it for yourself, I suppose, huh?

Andrew Pudewa: Yeah, I guess. But you know, it's very interesting. Screens are so magnetic. And they're hypervisual. And all you have to do is pull out a screen, and every child in the room will run over to see what's on your screen.

Julie Walker: It's true. I've had this happen to me at the doctor's office. It's like, it's just email.

Andrew Pudewa: This was, of course, before people were more subtly doing everything on their phones below the desk. This is almost ten years ago. Now the problem probably is more distraction by phone. But that idea that, yeah, I can take notes. And they even sell software that you can put on your computer that will eliminate every other program from being available to you while you're trying to write something.

That's like focus writing software kind of thing so that you don't have the temptation to just click over and check the newest thing. Or you get a beep, and, oh, no, this must be a very important text! Whatever. Another study showed ... This was Mueller and Oppenheimer, *Psychological Science*, 2014: "The pen is mightier than the keyboard: Advantages of longhand over laptop notetaking." This got a lot of traction. This was reported in so many major media outlets. This study was very comprehensive. But what they found is that even without distractions, people who wrote their notes on paper had better recall than people who typed.

And one of the things they observed is that, well, you can type faster than you can write (most college students). So therefore wouldn't it be better? But what they found is that people who would type what they're hearing weren't listening as carefully to decide what's worth writing down and what's not.

They were just more mechanically transcribing, whereas people who wrote on paper would write less, listen more, tend to rephrase, in their own kind of way of understanding something, what they had heard, thereby improving comprehension. So that was a big one. That was probably the one that got the most traction that I'm aware of.

Julie Walker: Well, and I wonder, Andrew, when you're speaking at a conference ... I don't know how often people take notes on a computer in the audience, but isn't that kind of a distraction to you? Do you think, oh, if I could just get this person to look at me?

Andrew Pudewa: Maybe once upon a time, but I'm pretty used to it now. I don't like doing schools professional development where everyone has their laptop out because then no one's looking at you. But if it's, you know, in a homeschool conference, there's a few people out there, usually the dads.

Another thing that a couple of my good friends have adopted is the tablet you can write on. So you're actually handwriting, but then you can store it easily. You can actually have handwriting recognition. And it'll change it into text. And then you can manipulate and use that text.

Julie Walker: Yeah, that sounds like a really handy tool.

Andrew Pudewa: Yeah, so. All right, then one last study that was kind of interesting here: Virginia Beringer. She also did several things. This was a five-year overlapping cohort longitudinal study, which I guess means it took a really long time with a whole lot of people involved. But what they concluded here and published in *Developmental Neuropsychology* back in '06 was writing letters by hand speeds up recognition.

So when children are learning to write letters, the more they learn to write them on paper, the faster they learn to recognize them elsewhere.

Julie Walker: Right.

Andrew Pudewa: And this is backed up by all sorts of other research I personally experienced when I was in Japan. I was trying to learn to read Japanese, and I just ... It was really hard, and I decided that I should learn to write the Japanese characters. So I started grade one kanji. And I just started learning to write these things. And it was funny; as soon as I could write a character, I could recognize it anywhere.

Julie Walker: Oh, right. Yep.

Andrew Pudewa: It was like inside me in a much better way. So by taking the writing of letters out of the primary grades on paper and using screens or identification materials on screens, we're actually impeding reading development.

Children grade two to five wrote more when they wrote on paper, which is not surprising because that young of kids typing is not ... It's going to take years to ...

Julie Walker: It's a treasure hunt. Yeah.

Andrew Pudewa: ... get to a typing speed. But they also found that handwriting helps to improve self-control. And from a neurological, physiological point of view, handwriting on paper involves more neural activity. So actually more brain cells are firing when you're writing on paper as opposed to when you're typing.

Julie Walker: Which is super important when you're young.

Andrew Pudewa: Well, and the interesting thing, and this was Mangan (back, our Norwegian super researcher woman). They found that writing on paper caused more bilateral cortical activity. So you have the dominant hemisphere, or some people say *left brain* because they're right-handed, and that corresponds with the language, logic, executive function. And then the subdominant or right brain if you're right-handed subdominant – that corresponds with the intuitive, artistic stuff, right? That left brain, right brain.

But what they found is that there was more bilateral activity; i.e., when you're writing on paper, you are better able to access the artistic, intuitive part of your brain. You know, I think we could

look and say probably the greatest prose that's been written ever was written slowly and probably by hand. And I don't know of a single book written on a computer screen that I would say is as good as some of the ...

Julie Walker: classics

Andrew Pudewa: ... generally good books that were written some time ago. There could be other reasons for that, but I thought that's very interesting how if you want more artistic, intuitive, expressive writing, you've got to get that subdominant hemisphere involved.

Julie Walker: Well, that's a really nice segueway into now manuscript versus handwriting because I would say that handwriting is probably more artistic.

Andrew Pudewa: Well, that's exactly what they found. Now there's a big debate on whether cursive should be taught in schools. The anti-cursive position is

1. Very few people use it.
2. There is little research to show the positive effect on other learning.

Now when you think about it, it's pretty easy for someone to write, "There's little research to show ..." because what it really means is "I have found very little research to show ..." Also, this was written around the time of the Common Core State Standards Initiative. And the point was, well, common core state standards are created by experts, and they do not include any cursive.

Julie Walker: Oh, right.

Andrew Pudewa: Therefore, it must be unnecessary, which ... There's a logical fallacy in there, but ... And then the last one is that cursive instruction is time consuming and would take time from more important things. All right. The pro-cursive argument; it should be taught:

1. builds sensory motor coordination.
2. develops the brain better than printing

And we see that in various researches. This is a big one:

3. Learning to write in cursive allows a person to read it.

Julie Walker: Oh, sure, yeah.

Andrew Pudewa: There's a cute little comic I saw. There's these two old ladies sitting there talking. And one says to the other, "Ha, ha ha. Cursive is now like our secret code."

Julie Walker: Right? Because no one can read it anymore.

Andrew Pudewa: And in the world of, you know, dyslexia, what they find is that because cursive letters are more distinct than printed letters ... You just think about the difference between a printed /b/, a printed /d/ versus a cursive *b*, a cursive *d* ...

Julie Walker: Oh, yeah, sure. They look very different.

Andrew Pudewa: ... that it helps a lot to reduce reversals and that students acquire a sense of accomplishment and pride and individuality as their cursive developed. So you know, that's pretty good. There are some kind of interesting studies showing that that stores in different areas of the brain. So people with a stroke who get alexia, or impaired reading as the result of a stroke, – some lose the ability to read print but retain the ability to read cursive or vice versa.

Julie Walker: Oh, interesting. Sure. Right. Yep.

Andrew Pudewa: So it is different. It's storing differently, which would indicate that by learning both, you're actually making more neural connections, which ultimately is of value. And then this came out from the Miami Dade County Public Schools, and it may or may not be well researched. There were multiple studies cited on the Dade Schools' website. But here's what they claimed.

Students with better cursive handwriting received higher scores on composition, especially on standardized tests (the SAT when it used to have an essay). And that makes sense because you can write cursive faster than you can print. And the more words you write, the better your score is going to be.

Julie Walker: Yeah, and if your cursive is better, the grader can actually read what you're writing.

Andrew Pudewa: And this one is probably not an issue, but I thought it was funny. Doctors' poor handwriting is responsible for the death of over seven thousand people each year according to the National Academy of Science Institute of Medicine.

Julie Walker: Oh, dear.

Andrew Pudewa: But you know what? Doctors don't write anymore. They have little assistants that go around with them with a tablet or a laptop and type everything the doctor says. So hopefully now, seven thousand people a year now are not dying because doctors have figured out that they should get someone else to do their work for them.

Julie Walker: So we're almost out of time. So let's wrap up with the pen versus pencil.

Andrew Pudewa: And people can read the whole article, but here's what I was so excited when I found this because I had for years been teaching that pencils can be neurologically tactile, emotionally disturbing. Pencils can contribute to tired hand disease. Erasing is a horrific waste of

time, and erasing disrupts the flow of thought. That was from my TWSS way back, when I first met you.

And I found it: Shirley Tawny, as part of her master's thesis published in the *National Council of Teachers of English*, January 1967 – Her paper said results of switching first grade students to pen:

1. less grip tightness
2. faster writing speed
3. papers less smudging
4. No erasing encouraged better thinking.

Julie Walker: Wow!

Andrew Pudewa: And I was just so excited to find this because, you know, it's 1967. There were no computers. I mean, that was probably the day when they didn't even consider not teaching cursive to people. But this idea of switching first grade students to pen – I thought, I am vindicated not only because I was right to begin with, but because someone did some research for a master's thesis that proves the truth.

Julie Walker: Yes. Well, and I could just imagine a first grader thinking it's very special to be able to write now in pen. And that's something that you, of course, encouraged our students in the *Structure and Style for Students*. No erasing allowed. Use a pen. It's the true way.

Andrew Pudewa: Yeah. So this talk – You know, like I said, it's a little bit dated. It's about six, seven years old. But really how much has changed? I think the trend we're seeing, and I know this is true because the teacher I met at the school I was at, who said the state tests – the kids have to type. Fourth grade children have to type their writing.

She said that what they're seeing, especially in the upper grades, is kids aren't writing, and they're not typing at all. They are dictating to their phone with pretty good voice recognition and then just pasting that into a document, turning it in, and saying, "Here's my paper."

Julie Walker: Oh, wow, okay.

Andrew Pudewa: There could be a lot of problems with this.

Julie Walker: Yeah, could be.

Andrew Pudewa: But you know, I think one thing that we can realize is that it's important to think before you speak. It's equally or perhaps more important to think before you write. Speaking forces you to think faster. Writing allows you to think and ponder and consider: Is this what I really want to say? Does this mean what I think it does? Is this the best way to say this idea? And so that idea of having the time to slow down will improve not just the quality of the writing but the quality of the thinking that goes into it.

Julie Walker: Yep. Well, listener, if you just felt like you got blasted with a fire hose with all of this great information and equally great research, you can find the link to the talk “Paper and Pen: What the Research Says” along with Andrew’s PowerPoint that you can print out because we actually have it there as a PDF. You can print out, and you can read through it, share it with your friends, and just know that perhaps after all these years, Andrew, you were right.

And we look forward to hearing more exciting things that you’re learning about as you’re doing research. I just have a question though. You teased us and said, “If there’s time ...” Well, there’s no time, but you can tell us what the best pen to use. What’s the best pen?

Andrew Pudewa: A good quality fountain pen.

Julie Walker: Oh, a fountain pen. Oh, boy.

Andrew Pudewa: Actually it does so many things. Number one, it requires a proper angle of the pen on the paper. So a ball pen you can hold at any angle. And you see some kids that hold it weirdly. And you know, it’s handicapping them, whereas the fountain pen – to make it work you’ve got to keep that most comfortable, convenient, useful angle going.

Julie Walker: Yes. Yes.

Andrew Pudewa: And it does slow you down a little bit, but there’s something that ... It just crosses one more zone into the artistic nature of writing. And if you’re not sure, try an experiment. Write something out with paper, with a regular pen on paper. Then get a nice fountain pen, and write something out with that. And you will feel a difference.

Julie Walker: Thank you, Andrew.

Andrew Pudewa: My pleasure. Thank you for being my number one groupie of all time.

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