

**Built Differently, Not Less: How Artificial Intelligence Enhances Learning for a
Neurodivergent Learner**

Brittany Molenaar

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Abstract

Debates about artificial intelligence (AI) in education often focus on cheating. This paper argues that AI, used with purpose and care, is a tool that helps students work and learn, enhancing rather than replacing the learner. Drawing on research and on the author's experience as an adult learner with attention-deficit/hyperactivity disorder, dyslexia, dysgraphia, symptoms of posttraumatic stress disorder, and suspected autism, the paper explains how these conditions affect attention, sensory processing, reading, writing, and memory. It then describes the regulation strategies that make learning possible and the AI tools that support it: text-to-speech, dictation, AI-assisted note-taking, note organization, flashcards and retrieval practice, and AI-generated music. Comparing AI with earlier labour-saving technologies, the paper concludes that AI should be judged by how it is used, not by whether it is used.

Keywords: artificial intelligence, assistive technology, neurodiversity, ADHD, dyslexia, universal design for learning

Built Differently, Not Less: How Artificial Intelligence Enhances Learning for a Neurodivergent Learner

Every major technology that has changed how people work has also changed how people learn, and each one has been met with suspicion. Artificial intelligence (AI) is the newest example. In schools and universities, the conversation about AI often begins and ends with one question: Is it cheating? Generative AI tools can explain, summarize, organize, and convert information. That makes them easy to misuse, but also powerful supports for learners whose brains process information differently (Kasneci et al., 2023; Zawacki-Richter et al., 2019). This paper argues that AI, when used with purpose and care, is a tool that helps students work and learn; it does not replace the learner but enhances learning. To illustrate that argument, I draw on my own experience as an adult learner with attention-deficit/hyperactivity disorder (ADHD), dyslexia, dysgraphia, symptoms of posttraumatic stress disorder (PTSD), and suspected but undiagnosed autism spectrum disorder (ASD). Being neurodivergent makes me a complex learner with disabilities. It does not make me less intelligent. I can do many things; I just do them differently.

Understanding the Learner Behind the Tools

ADHD, Dyslexia, and Dysgraphia

ADHD is a neurodevelopmental condition marked by persistent patterns of inattention, hyperactivity, and impulsivity that interfere with daily functioning (American Psychiatric Association [APA], 2022). Barkley (1997) described its core as a difficulty with behavioural inhibition, the internal brake that lets a person pause, hold information in mind, and choose a response rather than simply react. In daily life, this can look like losing the thread of a lecture when a thought wanders, starting tasks without finishing them, or reacting emotionally before

thinking. Emotional dysregulation is now recognized as a common and impairing feature of ADHD (Shaw et al., 2014). ADHD is also highly heritable (Faraone & Larsson, 2019), and I see that in my home. I am raising five neurodivergent children who struggle with executive functioning, impulsivity, and emotional maturity, and I help them regulate because I understand those struggles from the inside. I still have them too; I have simply matured enough to separate a genuine need from an impulsive executive response.

Dyslexia is a specific learning disability of neurobiological origin that affects accurate or fluent word recognition, spelling, and decoding, and it can limit reading comprehension over time (Lyon et al., 2003). Dysgraphia refers to difficulties with writing, including handwriting, spelling, and organizing ideas on the page (Chung et al., 2020). For me, these conditions do not mean I cannot read or write. Through years of adaptation, I read well. But long, dry texts are taxing, and when my eyes are tired, it becomes difficult to encode what I am reading. Writing after a long day can feel like pushing my thoughts through a narrow pipe.

Sensory Sensitivities and Suspected Autism

Differences in sensory processing are a core feature of ASD (APA, 2022; Robertson & Baron-Cohen, 2017), and they are also common among people with ADHD (Ghanizadeh, 2011). I have not been formally diagnosed with ASD and do not claim that diagnosis, but I experience sensory traits often associated with it. Both outside and internal stimulation compete for my attention. An open door, someone tapping a pencil behind me, or the hum and flicker of fluorescent lights can each become the object of my focus. Clothing that is too tight, itchy, or uncomfortable can do the same. Walking through a hallway crowded with people moving in every direction can be overwhelming. Cognitive load theory helps explain why this matters: Working memory has a limited capacity, and anything that uses it up, whether it belongs to the

lesson or not, leaves less room for learning (Sweller, 1988). For a sensory-sensitive learner, the environment itself can become a heavy load.

Trauma, Stress, and Learning

PTSD can develop after exposure to traumatic or threatening events. Its symptoms fall into four groups: intrusive memories, avoidance of reminders, negative changes in thinking and mood, and heightened arousal and reactivity, such as hypervigilance, irritability, trouble concentrating, and an exaggerated startle response (APA, 2022). After many high-conflict experiences, including a high-conflict divorce, I developed PTSD symptoms, and when they are triggered, my learning is severely affected. This is not a matter of willpower. Stress rapidly weakens the prefrontal cortex, the brain region that supports working memory, attention, and flexible thinking (Arnsten, 2009), and it can disrupt how memories form and are retrieved (Vogel & Schwabe, 2016). A triggered learner is, quite literally, learning with fewer resources.

Regulation Comes First

Before any tool can help me learn, my nervous system must be ready. I attend counselling regularly, where my therapist uses eye movement desensitization and reprocessing (EMDR), a therapy with research support for adults with PTSD (Cusack et al., 2016). A medical practitioner follows me regularly, and I take medication alongside therapy; medication is a well-established treatment for ADHD in adults (Cortese et al., 2018). I exercise, meditate, and stretch every day. Mindfulness practice has shown promise for improving attention in adults with ADHD (Zylowska et al., 2008), and daily stretching helps me release overstimulation and reactive responses in my body. I have also researched neurodiversity extensively, and I keep learning new strategies.

I adapt my environment as well. I look for a quiet place to study. When the setting cannot accommodate me, I wear noise-cancelling earphones, sit against a wall, or position myself away from high-traffic areas so that passing bodies do not pull my attention. When I am overstimulated, I step away to a quiet space, use my strategies, and return once I am regulated. These choices reflect Universal Design for Learning (UDL), which calls for multiple means of engagement, representation, and expression so that learners can reach the same goals by different routes (CAST, 2018). AI tools extend those same principles into my daily study.

How I Use AI to Learn

Reading by Listening

I listen to my readings with Speechify, an AI-powered text-to-speech application, and I have trained my brain to listen at double to triple speed. Research supports this approach. A meta-analysis found that text-to-speech and read-aloud tools improve reading comprehension for students with reading disabilities (Wood et al., 2018), and a study of lecture videos found that learners could watch at up to double speed with little loss of comprehension (Murphy et al., 2022). My comfort at even faster speeds comes from practice, and I slow down when the material is dense. Listening does not replace reading; it rests my eyes while my mind keeps working.

Writing by Speaking

When writing becomes taxing, I use voice-to-text in my word processor and edit as I go. Dictation has helped students with learning disabilities produce stronger written work than handwriting alone, because it removes the bottleneck of getting words onto the page (MacArthur & Cavalier, 2004). If I struggle to read my own writing after a hard day, I have my word

processor read it back to me so I can catch errors by ear. The ideas, arguments, and word choices remain mine. The technology simply removes a barrier between my thinking and the page.

Taking Notes Without Splitting My Attention

Note-taking is demanding because it requires listening, understanding, selecting, and writing all at once (Piolat et al., 2005). When I must copy a slide while following what the professor says, my attention splits, and I lose both. Instructional designers are advised to reduce exactly this kind of split attention (Mayer & Moreno, 2003). I paste each slide into my notes as an image and focus intently on the professor's voice, writing down what is said rather than what is already shown. If the professor uses a key term I do not know, raises a topic that interests me, or speaks too quickly, I ask an AI tool to explain the concept, expand on the topic, or clarify my paraphrase of what was just said. I paste those responses into my notes and check them later against reliable sources. I also search the web for background reading and add what is useful.

Organizing, Practising, and Remembering

After reviewing my notes, I use AI to organize them, colour-code them, and set a font and size that are easier for me to read. If reading becomes too tiring, I convert my notes to audio and listen at an accelerated speed. To practise key concepts, I use another AI tool to turn my notes into flashcards that I import into Quizlet, where I review them, play learning games that keep me engaged, and test myself. Self-testing is one of the most reliable ways to build long-term memory, because actively retrieving information strengthens it far more than rereading (Roediger & Butler, 2011). When my brain is tired in every possible way, I use Suno, an AI music generator, to turn my notes or flashcards into songs in a genre I enjoy; melody can support memory for text, especially when a simple tune is repeated (Wallace, 1994). Each step still

requires me to decide what matters, check what is accurate, and do the remembering. AI changes the format. I do the learning.

The Band Saw Argument

New tools have always raised fears about what they will replace. During the Industrial Revolution, and again in the interwar and postwar eras, machines saved time and cost and made work easier, while specialized labourers worried about losing their relevance. Over time, however, automation has tended to complement human skill as often as it has replaced it, shifting people toward work that depends on judgment, creativity, and problem-solving (Autor, 2015). No one would tell a woodworker who cut the boards for his table with a band saw that he was cheating because he did not cut and plane them by hand. No one would accuse him of cheating for using an electric sander instead of sandpaper and elbow grease. He still designed the table, chose the wood, measured, assembled, and finished it. The skill and the table are his. Once new tools prove reliable, society accepts them. AI is no different.

Using AI With Purpose and Care

Like any powerful tool, AI can be misused. In a field experiment with high school mathematics students, those given an unrestricted AI chatbot did better during practice but worse on a later exam taken without it, while a version designed to guide students rather than hand them answers largely avoided that harm (Bastani et al., 2025). The lesson is not that AI should be banned but that how it is used matters. UNESCO's guidance on generative AI in education calls for human-centred use that protects learner agency and builds critical thinking (Miao & Holmes, 2023). In my practice, that means using AI to access, organize, clarify, and rehearse material, never to produce thinking I have not done. It means checking AI output, because these tools can be confidently wrong (Kasneci et al., 2023). It also means being open with instructors and

following course policies. The question educators should ask is not whether a student used AI, but whether the student used it to learn.

Conclusion

My disabilities are real, and so is my intelligence. Everyday life, from a crowded hallway to a flickering light, asks more of me than it asks of many others. I meet those demands through therapy, medication, exercise, mindfulness, changes to my environment, and a carefully built set of AI tools. Those tools do not learn for me. They let me listen when my eyes are tired, speak when writing is taxing, focus on one stream of information at a time, and practise in ways that keep me engaged. For educators and the public, the invitation is simple: Judge AI the way we judge any tool, by the purpose and care with which it is used. Used well, AI does not replace the learner. It opens the door so the learner can walk through it.

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