THE E-BIKE EFFECT: HOW AI CAN MAKE YOU SMARTER AND LAZIER

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ORIGINALLY WRITTEN IN ENGLISH AND PRESENTED DURING THE TEDX EVENT OF ROC NIJMEGEN. SEE THE RECORDING HERE.

Let me tell you a story.

My girlfriend hates cycling. Ever since childhood, it's been nothing but pure torture. Now don't get me wrong, she's not a lazy person. She likes to swim, loves to walk, occasionally runs, but cycling... that;s her nemesis. Yet every day, as a family doctor, she has no choice but to cycle to her practice. Through rain, wind, hail... welcome to the Netherlands, right?

Recently she bought an e-bike. She still cycles the same annoying distance, reaching the same destination, but with significantly less effort.

Now, I must confess: I sometimes borrow her e-bike. But unlike my girlfriend, I love to cycle. In fact, I'm an avid mountain biker.
So why would I want to use her e-bike?

Well, sometimes I want to travel faster and cover greater distances. Or maybe reach destinations I wouldn't otherwise visit. And sometimes I just want to conserve energy for something else.

Now you might be wondering: what does my girlfriend's e-bike have to do with AI? Quite a lot, actually. Because in my story today, AI is the e-bike for our thinking. And we live in a world where AI increasingly takes over mental tasks, we used to perform ourselves.

Now here's the thing: as a teacher and a writer, I love working with AI. But critics warn me: 'Be careful! AI might be destroying your cognitive abilities, making you mentally lazy!'

And you know what? They have a point. Studies show that if you rely excessively on technology that takes over your thinking, you can indeed become dependent and might end up losing the ability to flex those cognitive muscles yourself.

Yet, reality is much richer, more nuanced and far from black and white. Just like how me and my girlfriend both use the same technology, the e-bike, in different ways: the outcome of using AI also depends largely on how you use it.

Of course, AI itself isn't neutral - no technology is - but how we choose to engage with it matters tremendously.

This brings me to the concept of **cognitive offloading**. Meaning: outsourcing thinking tasks to technology, with the risk of losing the ability to do it yourself.

Now, this isn't new. Books store knowledge, calculators solve math, and apps navigate for us. Each offloads a different cognitive function.

But there's always a trade-off. Heavy reliance on calculators might weaken mental math abilities. Excessive use of navigation apps may reduce spatial awareness. And maybe you've heard of the Google effect - if you know you can look something up, why bother remembering it?

Yet, these same technologies also enable us to do more complex calculations, travel more efficiently, and find the information we need at the very moment we need it.

So cognitive offloading doesn't automatically lead to cognitive deterioration. It rather challenges, or even transforms, out thinking.

Consider two people solving a complex math problem: one by sheer brainpower, the other with pen and paper. The second person might solve it faster and more accurately, not because they're thinking less, but because they're thinking differently. Using external tools to extend their cognitive capacity.
So again: it's not that our thinking crumbles as soon as we outsource something.

But it does change, and that change requires awareness.

It's interesting to draw a parallel with physical tasks. We've always been eager to outsource those to technology. And for good reason. For example, bulldozers and cranes enable us to build structures that would be impossible with pure human muscle.

Yet we also choose to go to the gym to maintain our bodies. Or at least, people who value their physical health do so consciously. They deliberately create what you might call "**desired difficulties**" - struggles we consciously choose to stay fit. It's the classic 'use it or lose it' principle.

So why don't we approach cognitive tasks in the same way? What if we choose consciously which mental tasks we outsource to AI, and which ones we deliberately practice ourselves? Better yet, what if AI offers new ways to strengthen mental muscles - creating productive struggles where AI, like an e-bike, helps you reach new cognitive heights?

For example, when creating this TED-talk, I used AI to sharpen my thinking. To question my arguments, explore different perspectives, and get instant feedback on my reasoning. Not to do the work for me, but to bring me further than I could before.

So, no, the answer to whether AI makes you mentally lazy is not black or white.

Yet I do sometimes see this black-and-white reasoning. We've become very strict. As if every outsourcing of brain power to AI is inherently bad. As if by using AI for this talk, I've primarily made myself dumber.

I noticed this judgment in myself when I confronted a friend using AI for creative writing. I skeptically asked: "Aren't you afraid you'll lose your creativity?".

He laughed and said: "Barend, here's the problem. You're assuming I am creative, let alone that I want to be. AI isn't a shortcut for me. It's a miracle that for the first time in my life, I have a decent creative result".

Ouch, that hit home. Because who am I to demand that everyone must always engage in mental effort in every area? Isn't that just my own normative bias speaking?

Of course, there ís a real risk here. People who aren't intrinsically motivated to develop certain skills can use AI to bypass thinking entirely. But the question remains: is it my place to judge that as universally wrong? Different people have different priorities and different strengths. The tendencies we bring to technology-use are deeply personal.

Moreover, outsourcing certain cognitive tasks can even yield surprising outcomes. In a recent experiment, researchers asked two groups of students to brainstorm creative uses for a paperclip. One group brainstormed alone, the other with AI. Unsurprisingly, the AI group generated significantly more ideas. But they also felt less creative. The solo group produced far fewer ideas, but reported feeling more creative.

Clear as day, right: Outsourcing thinking reduces creativity.

But there was an unexpected finding: Students using AI had shifted their cognitive efforts from generating ideas to evaluating and refining them. A different but equally demanding mental skill. Using AI hadn't eliminated their thinking; it had transformed it.

As a teacher, this makes me question how we define and value different cognitive skills. Perhaps the generation growing up with AI is developing new capabilities in question formulation, discernment, and synthesis. Becoming conductors who don't play every instrument but know exactly how to get the best from each player.

But here lies a fundamental challenge in education. When students are externally motivated by grades, certifications and judgements from parents and teachers, rather than intrinsic learning, they will often choose the path of least resistance.

And not only that, they might also lack the knowledge and skills to make the right choice, ending up using AI merely to reach the same destination with less effort, potentially undermining their development.

To address this, we must go beyond simply adapting assessments. We need to determine which cognitive skills should first develop without AI assistance, while at the same time creating controlled confrontations with AI. Where students learn when AI offers a mere shortcut versus when it truly becomes a springboard to deeper learning.

This brings me to an additional insight: research shows that working effectively with AI - and I emphasize **effectively** - requires significant cognitive abilities: clearly articulating what you want, breaking down complex tasks, and critically evaluating output. This demands reflective ability, language skills, world knowledge, and digital literacy. When used this way, AI doesn't replace thinking - it challenges, strengthens and transforms it. But to learn all this, students need educational environments where they can develop both the motivation to make the right choice, as well as the skillset to transform that motivation into purposeful action. This requires rethinking why and how we teach, assess, and cultivate cognitive skills in an AI-enhanced world.

And remember, it’s never black and white: everyone approaches technology differently. The perfectionist student might use AI to check every detail of their work, sometimes spending more time than before. The pragmatic student races through with minimal effort.

Like I said: AI amplifies existing tendencies. For my girlfriend, the e-bike made a dreaded task manageable. For me, it broadened possibilities. And sometimes I deliberately choose my mountain bike, and go off cycling without any destination, purely for the enjoyment of the exertion itself. A choice my girlfriend finds utterly baffling.

But does that mean I lead a better life? I don’t think so. She sometimes engages with complex medical literature I would happily delegate to AI. We each choose different domains for challenge and shortcut.

So, technology use is always about who we are, when we use it, our intentions, our habits, our goals, and our characters.

Therefore, the next time you face the choice between offloading a cognitive task to AI or doing it yourself, ask: Do I want to make an annoying task bearable? Do I want to reach new destinations? Or am I choosing consciously for the struggle, keeping my mental muscles in shape?

Making the right and balanced choice is the challenge of our time. And this requires education that consciously builds in those desired difficulties - those productive struggles - both with and without AI. So young people learn to recognize that sometimes mental exercise, like physical exercise, is worth the effort. And in other situations a shortcut offered by cognitive offloading helps explore entirely new horizons.

So, to conclude: just as we Dutch brave our rain and wind - sometimes with e-bike assistance, sometimes through our own pedaling power, and sometimes by leaving the bike at home and just walk - we must navigate this cognitive landscape with similar intent and wisdom.

Because AI doesn't make us dumber, dumb choices do.

Thank you.