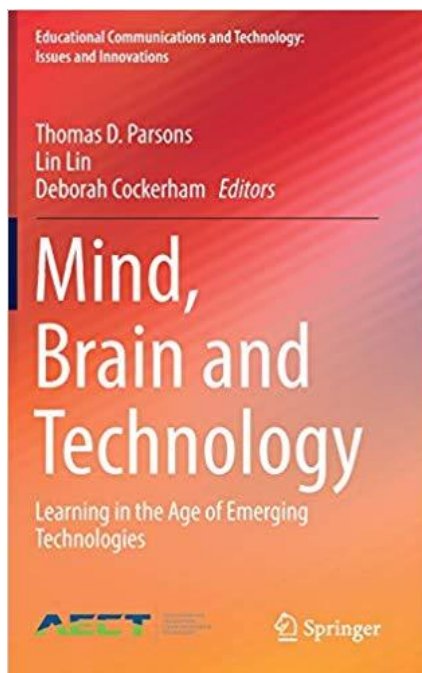




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Thomas D. Parsons, Lin Lin and Deborah Cockerham (Eds.) (2019) *Mind, Brain and Technology: Learning in the Age of Emerging Technologies*, New York: Springer (ISBN 978-3-030-02630-1) [Hbk], 242pp)



Digital Assistant: Hi, Jim. I have a book for you to review. I think you will find it interesting.

Jim: Sounds good, what's it about?

DA: Well that would be telling, why not read it, and I'll monitor your brain activity and general attentiveness, and you can tell me about it.

Jim: It's on neurology, I'm not really an expert on this but here goes. This book tries to point the way in which technology can enhance learning experiences when it incorporates discoveries in neuroscience and learning science. Looking at human learning through neurological lens. I like this Dewey quote, "if we teach today's students as we taught yesterday's, we rob them of tomorrow."

DA: Stay focused now, don't get distracted.

Jim: My assumptions about the book are quickly broken as the authors accept that learning is difficult to define, involving rich social interactions and emotions, and technology is inseparable from culture. They are using the book to think more broadly and explore possible futures rather than just present the hard science. They introduce neurological concepts of learning to orient us from this expanding research area.

I will summarise this as 'the way attention is drawn to things that do not conform to anticipated patterns, this triggers the brain to produce reward chemical dopamine. This 'learning juice' creates a driver for humans to seek out newness and learning. Technology is good because it provides us with more newness to explore, but bad because it generally distracts and over stimulates.'

This makes me think about how 'clickbait' distracts us when trying to learn something on YouTube. Some technologies and their uses are not helping or focus in fact they are built to distract. Which reminds me of the

way I use certain tools such as Cold Turkey to prevent me from accessing some sites while trying to write things up. That reminds me I might just check the news...

DA: Please focus Jim.

Jim: The book uses a really interesting idea from philosopher Daniel Dennett. If you haven't read him you really should. He uses the idea of the 'extended mind'. This is how humans have evolved: by externalising or offloading some of our cognition. Consider cave painting, language development all the way to computers: all tools to offload and free up thinking space. Now, arguably, we have the ultimate 'extended mind' in the form of the mobile phone. This has led to the idea of the brain being 'wetware' in connection with software and hardware. The book then expands, pulling through this concept of the 'extended mind' through an exploration of advances in neurological research and imagined futures.

There are lots to explore here but I will give you just three that got my attention. The first is attention itself, how research into gaze is increasing the possibility of tutorial systems to monitor students. This is a complex area and raises all sorts of questions and debates. It's also about you Digital Assistant.

DA: That's right, I am trying to keep you on track by monitoring your attention through various ways and interjecting if you appear to lose focus. Of course, I am a literary device, but real versions of me such as GURU, are in development and proving quite beneficial to learning.

Jim: I also like the concepts of 'resonance' and 'contemplation' and their connection with learning. As the book tries to develop its conceptual framework of learning these terms are touched on. Resonance describes

a strong connection we have for people, ideas or things. I liked how this helped me rethink how I learn and what draws my attention.

In terms of innovations in practice, it might be useful to others to think of how to help identify and explore students' resonances with the subject they are learning. In a similar way, contemplation is a fifth 'c' to accompany collaboration, communication, creativity and critical thinking in a framework of learning skills.

Although it wasn't particularly expanded on in this book, I like the way the term can be explored as it connects reflection with health and wellbeing, and 'downtime' away from digital stimulation. This book strongly advocates the use of problem-based and game-based learning. Through an analysis of the key learning attributes, they see this type of learning with technology as chiming closely with what is emerging in terms of neurological understanding. This possible future brings together the key skills of collaboration with attention and submersion in the task alongside appropriate feedback tools reacting to neurological indicators.

It was a shame this book did not provide more space to interlink and discuss some of the ideas across the chapters, but on the whole, it got my attention and brain juices flowing.

DA: Well done Jim, I thought you would like it.

Jim: Ta Digital Assistant. Could you write the book review for me?

DA: No!

Jim: Shall I just use the transcript of our conversation?

DA: That's a kind of lazy application of a literary device – it's much overused.

Jim: Arrghhh! What do *you* know?

Reviewed by **Jim Turner**
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