

The bigger picture

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The Bigger Picture

John Traxler¹

Abstract

In this piece, we ask readers and authors to stand back from the achievements, actors and activities described in the book and look at the wider context and critical issues. These include,

Firstly, the relationships of wearables with other established and emerging trends in technology enhanced learning and educational technology, asking about the need to collaborate, compete and co-opt in order to embed and endure.

Secondly, the place of wearables and the learning they afford within the rapidly changing global higher education environment, and the place of wearables and research into the learning they afford in the rapidly changing financial and ideological constraints of research funding and the policy that informs it.

And finally, the place and responsibilities of researchers in wearables as part of technology enhanced learning and educational technology within the global context of crises and change. These crises and changes being exemplified in economics, ecology, governance, legitimacy, amongst others, and sometimes characterised as indicators of a wider crisis in late global capitalism or some transition into post-modernity that unsettles our minds and our methods.

0. Introductory Remarks

All of the topics in this chapter form a contextual and critical framework for wearables and learning, and drive questions about equity, innovation, sustainability and education but are written from the perspective of a generalist outsider aware of the capacity of education and of technology for good or ill. So, approach the following remarks with caution, and adapt and adopt only the ones that seem to work. I am very conscious and fairly critical of the history, priorities and trajectory of mobile learning and its research community so I come at the wearables research community, if there is now such a thing, with baggage, perhaps insights and perhaps prejudices but mostly as an outsider. To be more specific, my history over the last two decades has been – apparently, not my words – that of a pioneer and thought leader in mobile learning but one increasingly disturbed by its research community's inability to adapt to the evolving impact and significance of mobiles across our societies. So, the following remarks may be variously highly insightful and stimulating critical thought or completely irrelevant, wholly inaccurate and stimulating dismissive disregard.

1. Trends and Fashions

Starting with the more tractable topic, it is easy to identify a handful of emerging *edtech* trends in formal education, such as micro-learning (Job & Ogalo, 2012), learning analytics

¹ John Traxler, Institute of Education, University of Wolverhampton, UK
John.traxler@wlv.ac.uk

(Siemens & Long 2011), the flipped classroom (Bishop & Verleger, 2013), open educational resources (OER) (Butcher 2015; Atkins et al 2007), mobile learning (Traxler & Kukulska-Hulme 2015), augmented reality (Wu et al 2013; Lee 2012), virtual reality (Cristou 2010; Allison & Hodges, 2000; Javidi 1999), MOOCs (massive open online courses, initially pedagogies but now mostly platforms) (Conole 2014) and maybe other or more recent ones, and put these alongside established trends and players such as the VLE (virtual learning environment, for example Canvas, Blackboard or Moodle), plagiarism detection and lecture capture. We must then ask whether learning with wearables should compete, combine, co-opt or collaborate with these; whether there is synergy or overlap in the race for resources and research, whether all their various underlying pedagogies are compatible and complementary or whether these pedagogies make them profoundly different. This of course assumes that somehow specific pedagogies are hardwired into specific technologies but having seen most of the world's ostensibly social constructivist VLEs used as repositories for slide decks and hand-outs, this is probably not the case.

These questions are however not purely academic or pedagogic since universities, schools, colleges and research institutes continue to operate within the wider economic, social, cultural and political environments.

Amongst other pressures, they must for example respond to the call for 'job-ready' graduates whilst also responding to calls for 'life-long learning' (Atkins 1999). In the current context of wearable technologies, this tension may mirror or echo a wider one between respectively specific concrete IT skills and over-arching digital literacy.

There is however also an underlying tension in looking all such trends and fashions, namely do they reform and reinforce the established institutions, professions, curricular and vested interests of formal education or is their status, visibility and application outside these established entities in empowering users' cognitive lives such as to challenge these established entities? To put it another way, do these trends or fashions represent opportunities to create, shape and share learning as well as to consume it? And can users appropriate these technologies to create new forms of knowledge and learning (Lai 2011)?

In answering these questions, we must be aware that there is ostensibly a benign argument, copied from the rhetoric of the mobile learning research community, that wearables promote the liberation of learning from the class-room, the campus and the textbook, experiencing the contingent mess of reality instead of the sanitised and managed version presented on campus by teachers. (There is almost the possibility that these two alternatives faintly capture concepts that might be called *modern learning* and *post-modern learning* – a proposition that it might be interesting to explore.)

Wearables, in this context, may actually be tethering rather than liberating (Traxler 2011; Cecchinato & Cox, 2017), just as mobiles are, tying learners back to old forms and formulations. By this we mean, the ways in which these technologies seem to free learners from physical presence, on campus for example, but actually managing and monitoring them remotely, subject still to the earlier hierarchies and relations.

This is complicated by the argument that wearables, even more than mobiles, are becoming prosthetic, embodied, *part of us*, only more so (Koefoed Hansen & Kozel, 2007; Cranny-Francis 2008). Do we want the education system to be *part of us*? Maybe not.

Moreover, arguing that learning with wearables enables contextual, personalised or spontaneous learning only works when contrasted with the non-contextual, impersonalised and scheduled learning often experienced within formal education and its institutions. If users with wearables are their own or each other's teachers, even if *or especially if* they do not even conceptualise it in that way or do not see the activities as teaching and learning, this argument is rendered null – there is nothing to contextualise or personalise learning *from*. Perhaps this, the union of the personal and the digital, is the pretext for a radical reconsideration of the relationships between education and society, for *deschooling* and starting again (Illich 1973; Selwyn 2012).

Wearables insert a powerful new variable across the whole spectrum of learning. Whilst we can identify the constraints and incentives that might drive this in the case of formal learning, beyond this we have a variety of definitions, such as informal learning, non-formal learning, incidental learning, self-directed learning, that must strive to capture the breadth of possibilities (Schugurensky 2000; Malcolm et al 2003). One line of thought has documented and analysed the 'learning projects' of individuals (Tough 1979), namely those significant events of self-directed learning in the lives of adults; and this might offer a way forward by working from the bottom-up, in terms of activities, rather than top-down, in terms of definitions. It does make learning both pervasive and trivial whilst constraining it to knowledge acquisition rather than knowledge discussion - and that would also be true of micro-learning (Brook et al 2012). Wearables, as another connection to people, context and the environment, might however provide extra and random stimuli that could provoke reflection and thought. Perhaps it is far too early to predict the impact of wearables on any learning outside the formal and only experience and evidence will eventually underpin new understandings.

And this takes us to a different perspective, that is the place of wearables in a world outside formal education where personal and social digital technologies enable people and communities to produce, share, discuss, transform and discard ideas, information, images and opinions, learning from each other and the environment, learning in groups, in communities and in isolation. This not only challenges formal education but places wearables, being personal and physical, in some kind of relationship with the Internet of Things. Suddenly the world becomes a richer and more informative place and the possibilities explode. We are obviously only at the beginning of the beginning in this respect.

2. Wearables and the Global Education Context

Wearables are, of course, at the mercy, perhaps like many innovations in educational technology, of political and economic ideologies and resources.

Since the sub-prime mortgage crisis in 2008 in the USA and its global consequences, there has been less money and more caution in both the public and private sectors, accompanied by a trend in Western Europe and USA away from statist centre-left ideologies to neo-liberal centre-right ideologies (Altbach et al 2009; Ball 2012). Consequently, universities globally

have become more corporate and more competitive. So, wearables in education are players in this analysis and we have to ask about their value and role. Do they represent components in corporate image-building, something to feature on institutional web sites? Do they have a role in the various league tables and key performance indicators? Does the ostensible mission of each institution affect how wearables are presented and packaged in the corporate context? As part of the educational support within elite academic institutions, as part of the cutting-edge agenda for research-intensives and as part of a challenging social issue for those institutions with an inclusion, opportunity and participation mission. And how will the educational wearables community access research funding? Curiosity-driven theory-building, improved academic efficiency, external corporate sponsorship or cost-effective innovation in the hope of increased equity and social inclusion (Martin & Etzkowitz, 2000)?

Clearly, researchers in educational wearable technology must position themselves astutely in the competitive market for research funding and institutional recognition. They must however also recognise the limitations of any research ethics process, for example unfamiliarity with the possibilities of emotional or psychological harm and the potential of emerging technologies (Carusi & De Grandis, 2012).

Another trend that is potentially undermining the historical understanding of the purpose of education in western Europe and US (Biesta 2009), has been the on-going 'hollowing out of the labour market' (McIntosh 2013), whereby those middling jobs between road-sweeper and brain-surgeon are progressively disappearing due to the general progress of digital technologies. This is accelerating due to the specific technologies of robotics, artificial intelligence (AI), the Internet of things (IoT) and performance support (Smith & Anderson 2014). This erodes the possibility of social mobility and erodes the role of education in delivering social mobility. Discussing education for unemployment is not politically palatable, so many education systems continue to pursue an unrealistic employment agenda and might promote learning with wearables within that agenda.

What also erodes the purpose of education, or rather the authority and relevance of formal education in the traditional institutions of education, is the universality of personal digital technologies that allow access to all the online content and communities of cyberspace and allow individuals and communities to create, share, transform, discuss and discard ideas, images and information whenever, wherever they like. Post-truth and fake news may be the downside of self-directed learning, symptomatic of a widespread slide into some kind of post-modernity. Obviously, the educational exploitation of wearable technology represents only a small corner of this change and turmoil, but one can ask whether learning with wearable technologies is not just personalized and individualized but also pathologically individualistic, contributing to separation, isolation and solipsism, the 'quantified self' (Swan 2012; Gilmore 2016; Lee 2013) as part of the 'neo-liberal nightmare', specifically that part representing unrestrained individual choice (Flew 2014). Moral panics have influenced earlier initiatives in technology and educational technology, and will no doubt continue to do so (Goggin 2006) but now resonate with the changed zeitgeist (Aupers 2012).

In this shorter section, we should ask about the possible place of learning with wearables in education outside in what is becoming an increasingly homogeneous global higher

education culture (Burbules & Torres, 2013). It is most likely however that the same economic, social and political forces that are driving this increase and this homogeneity are also driving the development of learning with wearables, meaning that inside this is where development, deployment and research will happen, and not much outside, except perhaps in the equally well-resourced environments of global corporates and businesses, delivering corporate training and performance support.

3. Wearables, Complicity and Crisis

Whilst the issues of educational technology in the context of various types of global crises may seem abstract and obtuse (Traxler & Lally 2015), there are obvious questions around involvement with military, pharmaceutical, automotive, political, corporate or security sponsorship or applications, not that these are intrinsically harmful connections but certainly they are morally complex and practically un-predictable in their implications and outcomes. These are however easy examples and the more philosophical question is about the role of education, and of technology and thus of educational technology. There is almost a default modernist liberal assumption that education and technology and certainly educational technology are unconditionally benign but they are clearly not. A more critical assumption might be that they serve someone's interests, usually those of the powerful and the hegemonic. This assumption at least prompts us to explore each educational technology and each intervention and ask, 'who?', 'how?' With wearables, like so many other examples, the answer is not simple or clear or consistent or stable. We must hope that there is some political will for policy priorities and public resources that exploit wearable technologies within education to improve equity and social justice, for example in the interests of people with disabilities and disadvantages, in the face of interests that maximize corporate profit or economic advantage. Cindy L. Anderson and Kevin M. Anderson discuss "Wearable Technology: Meeting the Needs of Individuals with Disabilities and Its Applications to Education"

It is certainly imperative to explore any new educational technology and ask whether it amplifies, reduces, transforms or complicates existing digital divides and social or economic inequality (Van Dijk 2006).

Of course, appropriation takes place, and this works in both directions. People and communities adopt and appropriate technologies and systems away from the purposes designed into them by corporations and states, for example, very consciously, the maker movement developing its own wearables (Peppler & Bender, 2013; Charlton & Poslad, 2016; Kafai et al 2014) and the reverse also happens, namely corporations and formal institutions co-opting popular and demotic forms. And there is serendipity. No one expected the NASA space programme to produce Teflon, and 3M were not trying to produce Post-Its (Krols 2012), thereby making any moral or political analysis less straightforward. Furthermore, 'unexpected consequences' commonly describes the outcomes of (educational) interventions in international development but should probably describe the outcomes of (educational) interventions in almost any social context or any social science (Sutcliffe 2011). All of these issues form the ethical context of wearables in education and educational research.

Concluding Remarks

The purpose of this contribution was, to use the English expression, *to set hares running*, not to catch or ensnare them. The subject of wearable technologies in education, like many other innovations or possibilities in educational technology, acts a provocation and a proxy for so many other wider concerns and we hope that this contribution illustrates what some of them might be, and that the other individual contributions can be read and considered in this light (Selwyn 2013).

To finish back on a personal note, in my view the mobile learning, quote/unquote, community is struggling for meaning, significance and impact, stuck in pre-2008 modalities, a ripple that's ignoring the tsunami; it should have looked forwards and outwards, not inwards and backwards. My hope is that these reflections avert something similar in the educational wearables research community. If there are specific lessons in this analysis, they might be something like, 'stay open, be critical, keep moving, but mostly, improve people's lives by engaging with people's lives'.

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