What's the matter with 'technology enhanced learning'?

This is an Author's Accepted Manuscript of an article published in *Learning, Media and Technology*.

Bayne, S. (2014) What's the matter with 'Technology Enhanced Learning'?. *Learning, Media and Technology*, DOI: 10.1080/17439884.2014.915851.
Available: http://www.tandfonline.com/doi/full/10.1080/17439884.2014.915851

What's the matter with 'Technology Enhanced Learning'?

Sian Bayne, The University of Edinburgh
sian.bayne@ed.ac.uk

Institute for Education, Community and Society
Paterson's Land
The Moray House School of Education
Holyrood Road
Edinburgh EH8 8AQ

+44 (0)11 651 6337

Abstract
In recent years, 'technology enhanced learning', or 'TEL', has become a widely-accepted term in the UK and Europe for describing the interface between digital technology and higher education teaching, to a large extent taking the place of other recently-popular terminologies such as 'e-learning', 'learning technology' and 'computer-based learning'. Yet there has been little critique in the literature of the assumptions embedded within the terminology of TEL: rather it has been adopted as an apparently useful, inoffensive and descriptive shorthand for what is in fact a complex and often problematic constellation of social, technological and educational change.

This paper subjects the term to a deeper analysis, drawing on insights from critical posthumanism, science and technology studies and Biesta's (2005) critique of the 'learnification' of education. In particular, it foregrounds the instrumentalisation of technology enacted by TEL, explores some of the problematic links between TEL and the philosophy of transhumanism, and critiques TEL for failing properly to interrogate its own ontological biases. The paper suggests that we need to be more careful with, and more critical of, the terminology we adopt to describe and determine the field.

Keywords: technology enhanced learning, TEL, posthumanism, transhumanism, learnification, STS

Introduction: mapping the rise of 'TEL'

Naming the complex, febrile relation of education to digital technology has been an often contentious project over the last couple of decades of UK higher education. From 'ICT for learning' to 'educational technology', from 'computer based learning' to 'online education' each differently-inflected term has had its moments and its adherents. Some have had more

traction than others, however. 'Learning technology' was perhaps a dominant term across UK university support units at the turn of the 21st century, ceding to 'e-learning' and its variants around the middle of its first decade. A rapid analysis of search frequency on these terms, using Google Trends, shows a steady decline of searches on 'learning technology' and 'e-learning' since 2004, and a rise in the new terminology of 'technology enhanced learning' which is specific to the UK. While there is usage of the term within other European contexts, it is very little in evidence elsewhere: on a global scale 'instructional technology', 'educational technology' and 'e-learning' still dominate.

Search trends are useful but perhaps less compelling than a simple snapshot of the rise in adoption of 'technology enhanced learning' (TEL) as the term by which support units and research programmes for digital education name themselves and define their scope. The UK now has TEL units, teams and centres at the universities of Lancaster (Centre for Technology Enhanced Learning, established in early 2012), Kings College London (Centre for Technology Enhanced Learning, established in 2012), Derby (TEL team established in 2010), and Liverpool (TEL team established in December 2012); there are others at Bristol, Plymouth, Surrey, Edinburgh and the University of the West of England to name just a few. Postgraduate programmes explicitly naming themselves for TEL are now being offered by Sheffield Hallam (MSc Technology Enhanced Learning, Innovation and Change), Huddersfield (MSc Technology Enhanced Learning), Lancaster (Doctoral programme in E-Research and Technology Enhanced Learning) and Durham (MSc in Technology Enhanced Learning). At the same time, research agendas clustering around TEL reach beyond individual university research groupings to national and supra-national programmes, notable examples being the UK research council Teaching and Learning Programme 'Technology Enhanced Learning' (2007-2012; funding of £12 million) and the European Seventh Framework Programme TeLearn programme (2006-12; funding of €211 million).

The term is adopted by the Higher Education Funding Council for England (HEFCE 2009) and the UK Higher Education Academy (HEA 2009). It has been used to name a new journal (The *International Journal of Technology Enhanced Learning*, first published in 2008), a European conference series and research network (the European Conference on Technology Enhanced Learning, first established in 2006 and run by the European Association of Technology Enhanced Learning), and has been adopted by the Universities and Colleges Information Systems Association (UCISA) as the most useful term for their regular survey of technology use within UK higher education teaching. While it is 'rare to find explicit statements about what TEL actually means' (Kirkwood and Price 2013, 1), the authors of the 2008 UCISA report do reflect on their shifting choices of terminology, mapping the shift from the 2001 report's emphasis on 'VLEs' (virtual learning environments), through the 2005 usage of 'e-learning' to the dominance, by 2008, of 'TEL':

> By 2008, there had been yet another semantic shift towards phraseology that attempted to capture more explicitly the enhancing role of technology upon learning, with the term Technology Enhanced Learning (TEL) gaining increasing currency. TEL is, therefore, the lingua franca used in the 2008 Survey. (UCISA 2008, 3)

TEL continues as the 'lingua franca' of the UCISA surveys until the most recent report, in 2012. The changing terminology over the period 2005-2009 is also referenced by HEFCE (2009) when the authors of their updated strategy for 'e-learning' (now called 'Enhancing learning and teaching through the use of technology') rationalise the change in the following terms:

> The first edition of our strategy [2005] talked about e-learning, but in the past three years, terminology, practice and contexts have developed. The term 'e-learning' can now sometimes be too narrowly defined to describe fully the widespread use of learning technology in institutions. We think it is more appropriate to consider how institutions can enhance learning, teaching and assessment using appropriate technology. (1)

Therefore previous terminologies are abandoned by HEFCE and UCISA in favour of a notion of 'TEL' which is claimed by one to be 'more explicit' about the enhancement value of technology (UCISA 2008) and by the other to be 'less narrowly defined' than the previously dominant term 'e-learning' (HEFCE 2009). Yet no genuinely convincing rationale is given in either report for why this shift to TEL is a desirable one.

In their paper reviewing interpretations of 'TEL' in the existing literature, Kirkwood and Price (2013) emphasise the tendency to use the term in an 'unconsidered and unreflecting' way (4). They make a brave attempt to synthesise the various tacit conceptions of enhancement in existing research, describing these as being focused either on a) 'operational improvement' in teaching and learning (for example, increased flexibility), b) 'quantitative change in learning' (for example improvements in assessment scores), or c) 'qualitative change in learning' (for example improved student interactions) (Kirkwood and Price 2013, 11).

In this paper, I approach the issue rather differently. Where Kirkwood and Price review the existing empirical research literatures to attempt a clearer definition of TEL, I will subject the term itself to a critique, in order to begin to question its widespread adoption by researchers, practitioners and policy-makers in the UK. I aim to argue that 'TEL', far from

being an unexceptionable and neutral term simply in need of clearer definition, in fact carries with it a set of discursive limitations and deeply conservative assumptions which actively limit our capacity to be critical about education and its relation to technology. At the same time, it fails to do justice equally to the disruptive, disturbing and generative dimensions of the academy's enmeshment with the digital. The language we use to define a field is always performative – it brings it into focus and into being in a particular way, and this focus of and mode of being is always ideologically-inflected. This paper attempts to trouble the particular performances enacted by 'TEL'.

I frame the paper around three core questions: What's wrong with 'technology'? What's wrong with 'enhanced'? And finally, what's wrong with 'learning'? I draw on three different frameworks in addressing each question: first I use insights from science and technology studies to draw into question what we mean by 'technology' within this context; I then adopt a position from critical posthumanism to look again at 'enhancement'; and finally I reference Biesta's (2005) work on 'learnification' to emphasise what might be problematic in our too-ready use of the 'language of learning'. My use of the three different frameworks is promiscuous, and in drawing on them I do not wish to suggest that they are homogenous, or that they would converge on a single position with regard to TEL or its broader contexts. Of course, there are many tensions and positional nuances between them: for example, the position on the value of retaining the concept of the human subject is very differently held across areas of science and technology studies, the philosophy of critical posthumanism (Braidotti 2013, 37) and Biesta and others' position on humanism within education (Biesta 1998; Edwards 2011).

However they offer particular convergences and mappings which help us with the task in hand, and I will conclude the paper by focusing on these, and on the ways in which they might help us understand TEL as a reductive discourse rendering the deeper questions around technology in education resistant to discussion. These areas of convergence cluster around the themes of individual transcendence and its relation to learning as an economic transaction; post-anthropocentrism and the humanistic bias of TEL; and the need to better focus on the complex ecologies and broader sociomaterial contexts of TEL practice and research.

What's wrong with 'technology'?

What we mean by 'technology' in the context of 'technology enhanced learning' is rarely made explicit in the documents which make use of the term: there appears to be a sense in which it is seen as needing no further qualification. Where definitions are given, the overwhelming emphasis is on the role of technology as a 'supportive' mechanism for the already-existing educational activities of teaching and learning (see also Kirkwood and Price

2013). For example, the UCISA surveys from 2008 to 2012 emphasise a definition encompassing 'any online facility or system that directly supports learning and teaching. This may include a formal VLE, an institutional intranet that has a learning and teaching component, a system that has been developed in-house or a particular suite of specific individual tools' (UCISA 2008). The European Framework 7 TeLearn programme describes itself as investigating 'how information and communication technologies can be used to support learning and teaching, and competence development throughout life' (CORDIS 2012), while The *International Journal of Technology Enhanced Learning* makes reference, slightly more expansively, to TEL as 'the best term to describe the domain of knowledge society technologies as applied in the learning context' (Inderscience 2013).

Technological variety and multiplicity is generally 'black-boxed' in these accounts: part-defined at best, sealed-off from interrogation via vague and homogenising terms like 'ICT' or 'online facility', technology is then positioned firmly as being 'in service' to the demands of the prior social activities of learning and teaching. This bracketing-off of technology from social activity is expressive of a more fundamental division of society from technology which is widespread within the field of digital education. By casting technology as being simply about the 'enhancement' of existing practices – in other words, as separable from social practice and 'in service' to it – we execute what Hamilton and Friesen (2013) have described as an elision of 'a fuller understanding of technologies as social objects' (3). In this sense, the 'technology enhancement' account is bemusingly free from the influences of contemporary thought within the fields of science and technology studies and the philosophy of technology, in which what Latour refers to as the 'Gordian knot' of social context and technical content is continually being re-worked and re-tied (Latour 1993, 3).

Hamilton and Friesen (2013) construct a strong critique of online education research from the perspective of science and technology studies, describing it as being overly-dependent on two simplistic, 'common-sense' understandings of the nature of technology: the essentialist and the instrumentalist. Where essentialism attributes to technology a set of 'inalienable qualities' immanent to the technological artefact (1), instrumentalism constructs technology as a set of neutral entities by which pre-existing goals (for example, 'better' learning) can be achieved. In both cases, Hamilton and Friesen argue, technology is cast as being independent of its social contexts, constructed as 'an independent realm of pure technical and scientific law, unsullied by the differences, values or interests that typify the social world' (20).

The rising popularity of 'TEL' as a phrase can perhaps be partly explained by the alluring and efficient neatness of its division of the social and the technological, and by the reduction of their complex entanglements to a clear relation of subordination: technology can be utilised

to enhance pre-existing personal and societal educational objectives (instrumentalism); equally 'learning' can be transformed by the immanent pedagogical value of certain technologies simply by allowing itself to be open to them (essentialism). We see the two perspectives repeatedly across the policy literatures which – often within a broader discussion of TEL – work and re-work the notions of 'harnessing technology' (for example BECTA 2008) and 'transforming education through technology' (for example JISC 2011).

Such over-simplification does the field no favours, either as a domain of research or as a domain of practice. Casting the technological and the social as isolated from each other in the context of digital (and post-digital) education merely robs the field of its complexity and richness, reducing our capacity to understand it as a domain of genuine social significance which is 'not about instrumental thought but about the very substance of our societies' (Latour 1993, 4).

Reducing a field of such complexity and importance to the terminology and discursive limitations of TEL, I would argue, constructs the digital teaching practices of the academy as worryingly impermeable to alternative, more critical understandings of the pedagogic and societal impact of technological change. Rather than asking how technology can 'enhance' learning, how it can service or 'transform' learning, perhaps we need to ask, with Hamilton and Friesen 'what our values are as educators and how we might envisage these values as operative aspects of online education as a sociotechnical practice. We need to ask not only what technologies can do, but where they fail in relation to our expectations of education' (16). Part of the problem here is the inherent conservatism of any discourse of 'enhancement', assuming as it does a pre-existing set of practices which are not in any need of radical shift or displacement, but are rather simply open to being made even 'better' by the judicious application of a little (in this case technological) assistance.

It is perhaps useful to ask what alternative frameworks we have to form a more nuanced understanding of the relation between education and technology? Referring back to Hamilton and Friesen's focus on the insights of science and technology studies as a way of thinking against instrumentalism and essentialism in educational technology research, it is encouraging to see a concern with the 'sociomaterial' foregrounded as being of growing influence in the field of educational research more broadly by Fenwick, Edwards and Sawchuck (2011), among others.

Fenwick et al critique educational research for its isolation of the social from the material, while also introducing a further criticism of the human-centred or 'anthropocentric' bias of much educational thought. While acknowledging that it is quite common for educational

research to take into account aspects of, for example, the built environment of the school, they suggest that:

> What is material is often taken to be the background context against which educational practice takes place or within which it sits, and material artefacts are often taken to be simply tools that humans use or objects they investigate. While giving a focus to the materiality of education, therefore, these approaches still tend to privilege the intentional human subject, which is assumed to be different or separate from the material. (1)

This argument aligns with my criticism of TEL as positioning the 'material' and technological as separate from and subordinate to social practice; however it also introduces a deeper critique of the failure of much educational research to give a proper account of the human subject and how it is constituted in intimate relation to its material contexts. Sociotechnical or sociomaterial approaches work against the isolation of society from technology, and human subject from non-human object, revealing how each is constituted by the other: they also problematise our dependence on certain conceptions of what it means to be human, suggesting that 'human' functions (like learning) are not pre-existing attributes of the individual separable from its social and material contexts, but are rather brought into being via a complex assemblage of the human and the non-human:

> Learning is an effect of the networks of the material, humans and non-humans, that identify certain practices *as* learning, which also entails a value judgement about learning as something worthwhile. This teaching is not simply about the relationships between humans, but is about the networks of humans and things through which teaching and learning are translated and enacted. (6)

If we take this view, it makes no sense to see 'learning' as open to mere 'enhancement' by the operations of an externally-applied technology 'solution'. Rather it asks us to understand learning, teaching and all associated academic practices as dependent on and enacted through the material contexts – including digital technologies – with which they are enmeshed. It also raises some fundamental questions about the ways in which we understand the human subject of education – questions to which I will return in the next section, which considers in more detail what might be problematic about the term 'enhancement'.

What's wrong with 'enhanced'?

My argument in this section of the paper goes beyond the earlier point which emphasised the conservatism of 'enhancement' as a way of positioning the technological to the social in

education. 'Enhancement', I suggested above, implies that there is an underlying 'thing' in possession of qualities which – far from being in need of erasure or re-constitution – are simply open to a little improvement and further consolidation via the ministration or utilisation of technology. In addition, I argue here that in the echoes which sound between 'enhanced learning' and 'enhanced cognition', the terminology of TEL creates a discursive link with transhumanism and the project of human enhancement, areas of thought with which TEL has more in common than may at first be obvious. For reasons that will become clear, this positioning is problematic for those wishing to take a critical perspective on education and technological change.

To clarify the terms being used here, it will be useful to distinguish between *transhumanism* and *posthumanism* in its critical form: the two are often used synonymously but are in fact in radical tension with each other. My suggestion in this paper is that TEL would do well first to take more explicit account of its problematic resonances with transhumanism and, second, to make better use of the critique of transhumanism offered by critical posthumanism, in starting to critique its own assumptions and biases.

Where critical posthumanism is concerned with the interrogation and critique of humanism, transhumanism is deeply committed to its core values, seeing itself as in essence an extension of the humanist project (Wolfe 2010). The primary concerns of the transhumanist worldview are with the perpetuation of the humanistic values of rationality, autonomy, dominance over 'nature' and human perfectibility via technological enhancement and the power of scientific progress (Bostrom 2005).

Critical posthumanism, in contrast, builds on the anti-humanism of what Braidotti calls the 'post-structuralist generation' (Braidotti 2013, 23), drawing on the mid 20th century questioning in philosophy and theory of the basic tenets of humanism, and of how 'Man' has come to be conceived and constructed:

> The revolutionary Enlightenment narratives that challenged an oppressive feudal order and reenvisioned 'man' as rational, autonomous, unique, and free have been in turn challenged and deconstructed. The emancipatory impulse of liberal humanism has come to be understood as being unwittingly complicit in colonialist, patriarchal, and capitalist structures. (Simon 2003, 3-4)

Where the assumption of a 'core humanity' and a shared human essence based in reason and autonomy still 'continues to enjoy the status of "common sense" in contemporary Western Culture' (Badmington 2000, 4), this perspective is no longer tenable in critical thought. After the critique of humanism, we are left in the position of no longer being able

to see the human subject as existing outside history or outside discourse. Instead, we can only see it as being produced in a whole range of discursive and material practices the meanings of which, as Wheedon (1987) explains, 'are a constant site of struggle over power' (21).

If it is no longer possible to define humanity as an essence – as a universally-shared property which exists independently of the social, the material and the discursive – we are left with a centre which does not hold, a 'devastating absence' (Braun 2004, 1352) where 'the human' once existed. It is this absence which, in various ways, critical posthumanism attempts to navigate.

Transhumanism, by contrast, takes a rather cruder view of the question. In general it is not particularly concerned with the interrogation of the human subject which informs more critical posthumanisms. On the contrary, it is quite explicit that transhumanism is not about 'the way we think about ourselves' – it is a violent historical moment in which 'radical technological modifications to our brains and bodies are needed' (Transhumanist FAQ 1999). The notion of technological 'enhancement' of the human is key here. For transhumanism, human evolution has taken a technological turn. Scientific intervention is proposed as having the capacity to remove human limitations via 'life extension therapies; reproductive choice technologies; cryonics procedures; and many other possible human modification and enhancement technologies' (Transhumanist declaration 2009, np). Yet after science and technology have worked over all human limitations – including mortality (Kurzweil 2005) – the transhumanists claim that something essentially 'human' will still remain: 'reason, intelligence, self-realization, egalitarianism' (Thacker 2010, 76). Technology here simultaneously, and paradoxically, enables both the transcendence and the preservation of the human.

The cryogenic, brain-download and bio-technological enhancement dreams of transhumanism may seem rather far from the core concerns of education but in fact they come rather close to some of the ways in which we think and write about TEL. Most notably, by clustering our discussions of digital education around the notion of learning enhancement we forge a discursive link – deliberately or not – to the transhumanist project of *human cognitive* enhancement. A brief look at some of this literature – generally neglected in TEL writings – perhaps helps to achieve a better focus on what it is we think we are talking about, when we speak in terms of the technological enhancement of learning. For example, the definition of 'cognitive enhancement' given by Bostrom and Sandberg (2009) provides a useful starting point:

Bayne, S. (2014) What's the matter with 'Technology Enhanced Learning'?. *Learning, Media and Technology*, DOI: 10.1080/17439884.2014.915851.
Available: http://www.tandfonline.com/doi/full/10.1080/17439884.2014.915851

> Cognitive enhancement may be defined as the amplification or extension of core capacities of the mind through improvement or augmentation of internal or external information processing systems. As cognitive neuroscience has advanced, the list of prospective internal, biological enhancements has steadily expanded (Farah et al. 2004). Yet to date, it is progress in computing and information technology that has produced the most dramatic advances in the ability to process information. (311)

Methods for cognitive enhancement explored by Bostrom and Sandberg in this paper include education (for them the most 'mundane' and long-practiced method), drugs, genetic modifications, prenatal and perinatal enhancement, external hardware and software systems, brain-computer interfaces and collective intelligence. Some of these methods would be well-recognised and accepted by practitioners and researchers in TEL – for example the design and crafting of external hardware and software systems for education was a driving concern of the UK Technology Enhanced Learning Programme, which posed the key question: 'how can we design technology that enhances learning, and how can we measure that enhancement?' (Noss 2013). Similarly, the enhancement value of social technologies which promote and enable collaboration and connection among groups, thus bringing into play the notion of collective intelligence, is well-established in TEL and related discourses.

Where Bostrom and Sandberg (2009) hold up the promise of genetic modification for improved memory, internal hardware tool implantation for an efficient brain-computer interface, and enhanced productivity and better information retention via cognitive enhancement drugs, the UK Technology Enhanced Learning Programme's final recommendations (System Upgrade, 2012) include the suggestion that we work to 'enhance teachers' productivity with new tools for designing teaching and learning'; 'employ tools to help learners make sense of the information overload'; 'understand how computers think, to help learners shape the world around them'; and 'utilise artificial intelligence to personalise teaching and learning'. The latter aims differ from the former in their technological scope, rather than in the nature of their aspirations. The issue here is that if we wish either to acknowledge or refute the discursive and ideological link between TEL and transhumanism, we need to have a clear critical sense of what it is we think TEL is trying to do: and in order to achieve that, we need to engage it in far broader discussions than the dominant instrumental and essentialist discourses allow us room for – questions about the nature of the human subject, equity of access to the material means of enhancement and the ethics of enhancement, among others.

Both TEL and transhumanist discourses are driven by the instrumental view of technology as being in service to the human and social which was critiqued in the previous section: in both, technology is viewed primarily as a 'tool' which has the capacity to make learning and/or 'the human' 'better'. However, what counts as 'improvement' is, as Hauskeller (2013) points out, highly context-dependent:

> We always need to ask what a better performance in a specific context is *good* for and, of course also for *whom* it is good… The context determines whether a change is, overall, an enhancement or not. That is why forgetting can be as much an enhancement as remembering. (14-15)

Thus the assumption embedded within everyday uses of 'TEL' that enhancement is always 'good' appears both normative and highly problematic. Its contextual specifics are generally radically under-considered. Transhumanist explorations of cognitive enhancement, for all their inconsistencies, do at least address, in academic and popular literatures, questions of ethics, politics, and how 'the human' is constituted in a time of great technological change. We might ask why TEL research and practice is *not* actively engaging in these broader societal debates, why it does not have a prominent voice in discussions on the ethics and governance of enhancement technology in all its forms, and why it does not more often interrogate the effects wrought by technological shift on the human subject.

Despite the broad scope of its concerns, however, transhumanism does not tend to draw on the broader critique of the human subject adopted by critical posthumanism. Like TEL, it sees technology as the 'object' which the human 'subject' acts upon in order to progress aims and ends which are pre-conceived from a position of human autonomy. As Thacker points out, such a view is blind to the 'ways in which technologies are themselves actively involved in shaping the world' (Thacker 2003, 76). An 'ontological separation between human and machine' (77) is assumed in this view – again somewhat paradoxically given the transhumanist assumption of the possibility of complete human/machine fusion via brain 'downloads' and advanced artificial intelligence (Kurzweil 2005).

TEL research and practice can learn from the critique of transhumanism posed by critical posthumanism, in beginning to question its own ontological bias, and to begin to critique itself. Critical forms of posthumanism allow us to move away from instrumental and essentialist constructions of technology, to tackle the totalising assumptions of humanism, to recognise human 'finitude' (Hayles 1999, 5) and to take account of the delicate material and cultural ecologies within which life is sustained. In troubling humanist notions of autonomy, rationality, dominance over 'nature' and the isolation of subject from object, critical posthumanism allows us to begin to think differently about how the human is

positioned and performed in relation to its material, social, discursive and ecological contexts.

A critical posthumanist position on technology and education would see the human neither as dominating technology, nor as being dominated by it. Rather it would see the subject of education itself as being performed through a coming together of the human and non-human, the material and the discursive. It would not see 'enhancement' as a feasible proposition, in that enhancement depends on maintaining a distinction between the subject/learner being enhanced and the object/technology 'doing' or 'enabling' the enhancement. And where 'enhancement' discourses have a tendency to decontextualise – to fail to interrogate in which contexts, and for whom, 'enhancement' is desirable – a critical posthumanist position would be committed to a detailed account of the social and political ecologies and networks through which technological innovation is performed.

This concern with context leads me on to my next section, which briefly considers what is wrong with 'learning'.

What's wrong with 'learning'?

In most instances, when we speak of 'technology enhanced learning' we are in fact referring to technology enhanced *teaching*, and to institutional goals, rather than to the aims or cognitive gains of individual learners: which 'virtual learning environments' are most appropriate for implementation within an institution, for example; or how assessment practices can be aided and enabled by technology; or how we might make access to learning materials easier for students. These are important issues for institutions and for teachers, but their primary concern is oriented to specific *teaching and administrative* goals (for example, improved assessment and feedback or more flexible course provision) rather than to learning per se.

It seems curious in this sense that 'TEL' should choose to so foreground 'learning' over 'teaching' in its rhetorical practices. However, as Biesta has emphasised in multiple publications (Biesta 2005, 2006, 2010, 2012, 2013), this shift to a 'language of learning' has been endemic across education in recent years:

> One of the most remarkable changes that has taken place over the past two decades in the way in which we speak about and in education, is the rise of the concept of 'learning' and the subsequent decline of the concept of 'education.' Teaching has, for example, become redefined as supporting or facilitating learning, just as education is now often described as the provision of learning opportunities or learning experiences. Adult education has become adult

> learning. And governments of many countries nowadays stress the need for lifelong learning and the development of a learning society. (Biesta 2005, 55)

While acknowledging that the language of learning has certain positive aspects – for example, in presenting a discursive challenge to 'authoritarian' and inflexible models of education (Biesta 2012, 38) – Biesta's work highlights the multiple ways in which the 'learnification' of education (Biesta 2010) is deeply problematic. As previous work by, for example, Friesen (2013) and Haugsbakk and Nordkvelle (2007) has foregrounded, many of his criticisms resonate with TEL and the critiques I have given above. I draw on two of his points in particular for the purposes of the current argument.

First, Biesta argues that the 'learning question is fundamentally different from the educational question', in that to speak of 'learning' in a generic fashion is to neglect the fact that learning within formal and informal education is teleological and contextual: '"learning" is to learn something, for a purpose, and from someone' (Biesta 2012, 36). Thus to reduce 'education' to 'learning' prevents us from asking critical questions about how educational goals are negotiated and how its power relations are constituted. In discursively shutting-out the social and material complications of a broader understanding of 'education', 'learning' becomes an ideology, a mask for the underlying tensions and stresses around how we define the purpose and function of education.

Hauskeller's critique of 'enhancement' as failing to ask questions about the context within which 'improvement' is 'good' resonates here in Biesta's point that we impoverish our capacity to be critical if we fail to take account of the intricate contexts within which learning takes place. Further, for Biesta, 'learnification' re-crafts education within the terms of an 'economic transaction':

> that is, a transaction in which (i) the learner is the (potential) consumer, the one who has certain needs, in which (ii) the teacher, the educator, or the educational institution becomes the provider, that is, the one who is there to meet the needs of the learner, and where (iii) education itself becomes a commodity to be provided or delivered by the teacher or educational institution and to be consumed by the learner. (Biesta 2005, 58)

In this view, education itself is constructed as instrumental in much the same way that technology is constructed as instrumental in TEL: as a means for 'meeting' the pre-defined 'needs' of learners. Such a position, for Biesta, is problematic in that it fails to take account of the fact that 'a major reason for engaging in education is precisely to find out what it *is* that one actually needs' (59). The social and material complexities that converge to

construct this 'need' are placed under erasure in a move which emphasises that the only valid questions we can ask about education are 'technical questions, that is questions about the efficiency and the effectiveness of the educational process' in meeting learner 'need': ultimately, then, 'questions about the content and purpose of learning become subject to the forces of the market'. (59)

In the context of Biesta's critique of the language of learning then, the construction of digital education in terms of TEL begins to be a little more understandable. The focus on technology enhanced *learning* can be seen as an element within – or even a driver of (Haugsbakk and Nordkvelle 2007) – a much broader adoption within education of market-oriented concerns with individualisation, demand, supply, efficiency, effectiveness and consumer need. As Friesen points out, the vocabulary of the language of learning itself represents an instrumentalisation of education which fits very neatly with – and perhaps even requires – the promises of TEL (Friesen 2013).

Conclusion

My argument in this paper has navigated through various theoretical perspectives which offer us ways to begin a critique of the rhetoric of TEL. In the first section of the paper, I emphasised the ways in which technology in TEL tends to be black-boxed, under-defined and generally described in instrumental or essentialist terms which either subordinate social practice to technology, or subordinate technology to social practice. TEL in this sense shies away from addressing questions to do with the nature and constitution of the human subject, falling back instead on a comfortable anthropocentrism which assumes an overly-neat boundary between what is human, and what is not.

I then moved on to consider how this 'ontological separation of human and machine' (Thacker, 2003) is also played out in the tacit alignment of TEL with other enhancement discourses, most notably those of transhumanism and the notion of cognitive enhancement. Here, the critique of transhumanism by critical posthumanism is useful to us in revealing how much of the discourse of TEL is located within an unquestioning dependence on humanistic values which have been drawn into serious question elsewhere in the academy: rationality, autonomy, dominance over 'nature' and the possibility of human perfectibility via technological enhancement and the power of scientific progress.

This concern with the instrumentalisation of technology was carried through into the third section of the paper in which it was linked to the instrumentalisation of education more generally, as it is enacted via the rhetoric of the 'language of learning' (Biesta 2005). For Biesta, 'Education is, can be, and should be about something else and something more than

what the learning managers, the learning facilitators, and the technicians of the new language of learning may want us to believe' (12).

In this sense, the paper has negotiated a pathway through three rather different theoretical perspectives, each of which do useful work in helping us think again about TEL: from the instrumentalisation of technology, to the ontological isolation of the human from its material contexts, to a broadening of those concerns from educational technology to education itself. I suggest that each strand of the argument points us toward a need to move beyond anthropocentrism and the focus on the individual, toward a greater concern with the networks, ecologies and sociomaterial contexts of our engagement with education and technology.

'TEL' would in this sense benefit from a greater critical engagement with the themes of critical posthumanism: to do so would give us a framework for understanding it as a field which is in many ways dealing with some of the thorniest and most pressing issues in contemporary society, to do with where the boundaries of 'the human' lie, who and what influences technological change, and how we conceive of the purpose and function of education. As Braidotti (2013) reminds us:

> Instead of falling back on the sedimented habits of thought that the humanist past has institutionalised, the posthuman predicament encourages us to undertake a leap forward into the complexities and paradoxes of our times. (54)

Thus this paper has argued that we would do well to draw on critical posthumanist perspectives to introduce a more nuanced understanding of digital education than TEL allows us: the very term 'technology enhanced learning' works to entrench a very particular – and ideologically-inflected – understanding of the relation between technology, education, individual and society. As researchers and practitioners of digital education, we need to move away from our over-emphasis on how technology acts on education, or how education can best act on technology. Let us rather acknowledge that the two are co-constitutive of each other, entangled in cultural, material, political and economic assemblages of great complexity. It is time to re-think our task as practitioners and researchers in digital education, not viewing ourselves as the brokers of 'transformation', or 'harnessers' of technological power, but rather as critical protagonists in wider debates on the new forms of education, subjectivity, society and culture worked-through by contemporary technological change.

References

Badmington, Neil. 2000. *Posthumanism*. Basingstoke: Palgrave.

BECTA. 2008. *Harnessing technology: next generation learning*. http://webarchive.nationalarchives.gov.uk/20101102103654/http://publications.becta.org.uk/download.cfm?resID=37346.

Biesta, Gert. 1998. Pedagogy without humanism: Foucault and the subject of education. *Interchange* 29 (1): 1-16.

Biesta, Gert. 2005. Against learning. Reclaiming a language for education in an age of learning. *Nordisk Pedagogik* 25 (1): 54–66.

Biesta, Gert. 2006. *Beyond learning. Democratic education for a human future*. Boulder, Co.: Paradigm Publishers.

Biesta, Gert. 2010. *Good education in an age of measurement: Ethics, politics, democracy. Boulder*, Co: Paradigm Publishers.

Biesta, Gert. 2012. Giving teaching back to education: responding to the disappearance of the teacher. *Phenomenology & Practice*. 6(2), 35-49.

Biesta, Gert. 2013. Interrupting the Politics of Learning, *Power and Education*, 5(1), 4-15. http://dx.doi.org/10.2304/power.2013.5.1.4

Bostrom, Nick and Anders Sandberg. 2009. Cognitive enhancement: methods, ethics, regulatory challenges. *Science and Engineering Ethics*. 15:3, 311–341.

Bostrom, Nick. 2005. A history of transhumanist thought. *Journal of Evolution and Technology*, 14(1), np.

Braidotti, Rosi. 2013. *The posthuman*. Cambridge: Polity Press.

Braun, Bruce. 2004. Modalities of posthumanism. *Environment and Planning A*, 36:8, 1352-1355.

CORDIS. 2012. TeLearn - European research on technology-enhanced learning. http://cordis.europa.eu/fp7/ict/telearn-digicult/telearn_en.html

Edwards, Richard. 2010. The end of lifelong learning: a post-human condition? *Studies in the Education of Adults*, 42(1), 5-17.

Fenwick, Tara, Richard Edwards and Peter Sawchuk. 2011. *Emerging approaches to educational research: tracing the sociomaterial*. London: Routledge.

Friesen, N. 2013. Educational Technology and the 'new Language of Learning': lineage and limitations. In N. Selwyn and K. Facer (eds). *The Politics of Education and Technology: Conflicts, Controversies and Connections*. London: Palgrave. pp.21-38.

Hamilton, Edward C. and Norm Friesen. 2013. Online Education: A Science and Technology Studies Perspective. Canadian Journal of Learning and Technology. 39 (2). http://cjlt.csj.ualberta.ca/index.php/cjlt/article/view/689

Hauskeller, Michael. 2013. *Better humans? Understanding the enhancement project*. Durham: Acumen Publishing.

Hayles, Katherine N. 1999. *How we became posthuman: virtual bodies in cybernetics, literature and informatics*. Chicago and London: The University of Chicago Press.

Haugsbakk, G. and Nordkvelle, Y. 2007. The rhetoric of ICT and the new language of learning: a critical analysis of the use of ICT in the curricular field. *European Educational Research Journal* 6 (1): 1-12.

HEA. 2009. Transforming higher education through technology enhanced learning. http://www.heacademy.ac.uk/resources/detail/learningandtech/transforming_he_through_technology_enhanced_learning.

HEFCE. 2009. *Enhancing learning and teaching through the use of technology: a revised approach to HEFCE's strategy for e-learning*. http://www.hefce.ac.uk/media/hefce1/pubs/hefce/2009/0912/09_12.pdf.

Inderscience. 2013. *International Journal of Technology Enhanced Learning*. http://www.inderscience.com/jhome.php?jcode=ijtel#moredesc

JISC. 2011. *Transforming curriculum delivery through technology*. http://www.jisc.ac.uk/whatwedo/programmes/elearning/curriculumdelivery.aspx.

Kirkwood, Adrian and Linda Price. 2013. Technology-enhanced learning and teaching in higher education: what is 'enhanced' and how do we know? A critical literature review. *Learning, Media and Technology*, DOI:10.1080/17439884.2013.770404.

Kurzweil, Ray. 2005. *The singularity is near: when humans transcend biology*. New York: Viking.

Latour, Bruno. 1993. *We have never been modern*. Translated by Catherine Porter. New York; London: Harvester Wheatsheaf.

Noss, Richard. 2013. Does technology enhance learning? Some findings from the UK's technology enhanced learning (TEL) research programme. Accessed 25 September. http://www.tlrp.org/docs/enhance.pdf.

Simon, B. 2003. Introduction: towards a critique of posthuman futures. *Cultural Critique*, 53, 1-9.

System upgrade. 2012. *System Upgrade – Realising the Vision for UK education* (2012). A report from the ESRC/EPSRC Technology Enhanced Learning Research Programme. http://tel.ioe.ac.uk/wp-content/uploads/2012/06/TELreport.pdf

Thacker, E. 2003. Data made flesh: biotechnology and the discourse of the posthuman. *Cultural Critique*, 53, 72-97.

Transhumanist declaration. 2009. http://humanityplus.org/philosophy/transhumanist-declaration/.

Transhumanist FAQ. 1999. http://humanityplus.org/philosophy/transhumanist-faq/.

UCISA. 2008. 2008 Survey of Technology Enhanced Learning for higher education in the UK. http://www.ucisa.ac.uk/~/media/Files/publications/surveys/TEL%20survey%202008%20pdf

Weedon, Chris. 1987. *Feminist practice and poststructuralist theory*. London: Blackwell.

Wolfe, Carey. 2010. *What is posthumanism?* Minneapolis: University of Minnesota Press.