Chapter 2
Counting on Use of Technology to Enhance Learning

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In 2002 the question of where we are going with *e-learning, online learning* and *networked learning* was raised, and *e-learning* was considered a 'blanket term' for 'quick-fix' forms of provision and support (Steeples, Jones, & Goodyear, 2002, p. 323). Well over a decade later, and similar arguments might now be applied to *Technology Enhanced Learning* (TEL). Globally, as a term, TEL seems to be competing with *e-learning* to offer a blanket solution in education. Rather than a quick fix though, the suggestion is that technology has now enhanced learning, and will continue to do so, closing further argument about how this actually happens (if at all) and prompting some people to question what meaning 'enhanced' actually embodies:

> Unlike other terms such as e-Learning or on-line learning, *technology enhanced learning* implies a value judgement: the word 'enhancement' suggests an improvement or betterment some way. (Price & Kirkwood, 2010)

> 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. (Bayne, 2014)

Unlike previous terminology, such as *Information and Communications Technology* (ICT), *Networked Learning* or *E-Learning*, in the phrase: TEL, a small, perhaps barely noticeable linguistic change, makes an adjustment to the disciplinary field of educational technology. The verb 'enhanced' is selected and placed in between 'technology' and 'learning', to imply (through a value judgement) that technology *has* now enhanced learning, and will continue to do so. This emphasises a simple economic gain in terms of enhancement, but at the same time takes the focus away from other forms of deeper and broader understandings of technology

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in learning contexts. In the following example, text from a European Commission report: *Educating Europe Exploiting the benefits of ICT*, published in 2009, TEL is attributed some rather extraordinary abilities:

> Technology-enhanced learning is transforming education and training to make it more effective, more attractive, more accessible and more adapted to today's contexts—personal, family, large-group, organisation, community, etc. (European Commission, 2009)

People are not transforming education here, TEL is. Furthermore, the use of 'more' four times can leave a reader in no doubt of the expectation that technology should, in all of these contexts, provide some form of 'exchange value' (Marx, 1867). However, this tends to quantify from the outset any links between technology and learning, as well as conceal a multitude of important assumptions (Hayes & Bartholomew, 2015). Drawing on the theory from Marx, technology is assumed in the quotation above to provide a measurable worth, expressed in terms of an 'exchange' for more 'effective', 'attractive' and 'accessible' learning. A simplified transactional approach both risks marginalising the human endeavours that are required in teaching and learning situations, and also treating technology as unproblematic and somehow detached from its wider political surroundings (Greener & Perriton, 2005).

In 2009 the UK's leading charity expert on digital technologies for education and research, the Joint Information Systems Committee (JISC) clearly stated a new emphasis on 'value':

> 'e-Learning' is still widely used to refer to the application of technology to learning. However, the term 'technology-enhanced learning' is gaining favour since it emphasises how technology adds value. (JISC, 2009)

Then a year later in a 2010–2012 JISC Strategy, TEL was described as a well-embedded and recognised move away from e-learning:

> The move from 'e-learning' to 'enhancing learning through the use of technology' is now well embedded and recognised. (JISC, 2010)

The embedding of the idea of 'enhancing learning through the use of technology', however, firmly structures educational technology within a framework of exchange value. It places emphasis on what technology is doing to yield a profit rather than how learning takes place as a human process (Nygaard, 2015). Whilst this may fit with a market-driven, capitalist approach, it is completely at odds with a critical pedagogical one, where learners are taught about emancipation from political constraints. In a critical pedagogy, the subjective experiences students and staff bring from their surrounding culture are emphasised as the starting point for learning rather than objective assumptions that technology, or indeed anything else, is experienced in the same way by all (Nichols & Allen-Brown, 1996). Yet an emphasis on 'added value' from technology in learning contexts seems to be widely accepted now, as demonstrated in excerpts from the USA, Australia and Europe, respectively:

> The responses of principals cited above suggest that school leaders need guidance in developing the capacity to distinguish between uses of technology for its own sake and uses of technology that add value in terms of student learning. (Bakia, Mitchell, & Yang, 2007)

The opportunities afforded by mobile, laptop and desktop technologies to aid or add value to the learning students undertake has, and continues to be, investigated by researchers around the world. (Moyle, 2010)

Projects that encourage individuals to share internet connectivity, to develop software, online content or virtual communities are examples of the added value of informal learning through ICT. (Commission of the European Communities, 2008)

Technology is thus positioned in global policy discourse in a role of improving the efficiency of teaching and learning. Tutors are said to 'need guidance' to develop its capacity, but this development is of a particular kind, based on a single argument that the technology, as an external solution, has been applied to learning, to yield something additional. However, to choose other routes, where 'economically useful knowledge' (Jessop, 2008, p. 4) is not the primary concern, is almost not considered a choice at all (Dahlberg, 2004). Yet, only two decades ago, in the field of educational technology, purely instrumental approaches had already been extensively questioned through semiotics, postmodern and post-structural theory (Belland, 1991; Nichols & Allen-Brown, 1996; Solomon, 2000; Yeaman, Hlynka, Anderson, Damarin, & Muffoletto, 1996). These researchers emphasised the contextual influences of what was being studied and the interrelations of technology (Luppicini, 2005, p. 106), with discourse, as meaningful for thinking and being. Now a 'trouble free' policy language seems to be 'loaded' with an economic expectation from technology in learning situations. This tends to reduce, rather than expand, how humans might understand technology more broadly, not as external to them, but as constitutive in the development of human knowledge.

Theoretically, varied language about technology in learning could provide new understandings as a 'fertile transdisciplinary ground' (Parchoma & Keefer, 2012) to inform policy. Yet terminology in policy about the connections between humans, learning and technology tends to become fixed in a less fertile position, linguistically (Hayes & Bartholomew, 2015). If we discuss technology as detached from the humans who perform tasks with it, then it simply becomes an external force acting on our behalf. This objective approach disempowers the human subject to undertake any critique, as it effectively removes them from the equation, closing down possibilities for more varied conversations across diverse networks.

Networked Learning

In university strategy documents it would seem that *Networked Learning* is not often the terminology of choice for policy makers. In an example below the assumption is that one term has subsumed another, closing conceptual space for other options:

E-learning is starting to subsume and replace a number of previously used terms such as communications and information technologies (C&IT or ICT), information and learning technologies (ILT), networked learning, telelearning or telematics and instructional technology. (Littlejohn & Higgison, 2003)

Yet there is no real reason for one term to 'subsume' another, unless the intention is for educational technology to have a very narrow focus, rather than become a multi-directional conversation about learning. To place these arguments into context, in a book on the topic of *Networked Learning*, we might consider what an understanding of a 'network' might mean when linking this with 'learning'. Networks have been discussed more broadly in terms of social settings, without reference to technology, and applied to organisations in particular (Jones & Steeples, 2002, p. 2). Networks might be distinguished from both hierarchical forms of organisation and from the anarchy of the market (Thompson, 1991). This argument provides us with a helpful distinction that allows us to take a step back from both of these forms of economically related organisation and to consider a more organic, networked approach. If networks represent a conscious *political choice*, as an alternative to state driven, or neoliberal forms of economic organisation (and discourse), then applied in terms of learning, power shifts in favour of learner autonomy and a more critical pedagogy. How then would this link with a broader understanding of technology?

Networked learning is considered as an outcome of the convergence of telecommunications and digital computer technologies (Jones & Steeples, 2002, p. 3) and increasingly through new mobile technologies and social networks, a folding of time and space around those learning. The words 'networked' and 'learning', when combined, unlike the constituents of TEL, do not seem to presuppose a universal approach of enhancement, which orders educational technology into a restricted epistemological framework. If networked learning can reach towards the principles of critical pedagogy (Freire, 1972; Giroux, 1992; McLaren, 1995) to connect this with technology-mediated learning design and participation, it offers us a broader spectrum to link the elements which compose TEL: *technology, language* and *learning* in more varied ways than the terminology of TEL prescribes.

At this point it is worth acknowledging that the above observations are not particularly new. Yet even if we believe dominant strategy documents have shaped an approach of 'enhancement' alone, through an economically related discourse, perhaps we now need to actually confront this analytically. Simply commenting does not seem to be enough to effect change. We need tangible instances to discuss in order to notice to what extent we repeat a pattern of purely economic expectation from use of technology. Yet there is always the possibility that TEL is simply stating more honestly than other terms the clear economic links now made in higher education between introducing technology to receive some form of learning payoff in terms of performativity. As long ago as 1999 Stephen Ball argued against such an approach, stating that the strong emphasis on education's role in contributing to global economic competition was built on a set of pedagogic strategies that were ultimately self-defeating. He suggested we were putting forward an 'impoverished' view of learning based on performativity (Ball, 1999). Since then expectations on educational technology to contribute to performativity in higher education have been expressed in terms of an expected transformation.

> The 2005 HEFCE strategy outlined a number of key aims and objectives, the first of which echoes the policy context for transformation in emphasising the use of technology to transform higher education. (Higher Education Funding Council for England, 2009/12)

There are many strategy documents like this one now available to examine more closely. This allows a reflection on whether we are writing policy for educational technology that is at all meaningful to staff and students. Given that there is much emphasis now in universities on careful design of written materials for the curriculum, perhaps there should also be a closer scrutiny of how educational policy and strategy is written. This would question how strategy actually links with theory about learning and technology. After a consideration of some theoretical ideas about technology from Lieras, this chapter then draws on some empirical examples from a bank of 2.2 million words of UK policy language to question what approach this language frames for learning. The textual examples were collected for a much bigger project that sought to understand what forces have structured our understanding of educational technology during the last two decades. Though from UK policy documents, the patterns detected through CDA can be noticed more globally too and appear to be shaped by a neoliberal agenda which frequently plays out as a call for greater marketisation of higher education. As Stevenson puts it:

> The language of markets, targets and tests is not only increasingly regulating education, but is driving out the possibility of other languages and closing the educational field to other possibilities. (Stevenson, 2010, p. 342)

Through Lieras (1996) the concepts of e*xternality, desubjectivisation* and *closure* will now be examined to consider ways we conceive, and thus discuss, technology in our work. The ongoing relevance of these categories is argued for understanding why, even via new diverse online media, the problem of a narrow interpretation of educational technology seems to persist in our language. Through a corpus-based CDA some examples are then provided to illustrate how we seem to count on 'use of technology' to enhance learning in higher education. A return to discussing *Networked Learning* is considered as a first step towards a more multi-directional conversation, where we might acknowledge the convergence of *technology, language* and *learning* in people's educational technology practice. Then a reconsideration of how we write policy for educational technology is recommended, with a critical focus on how people learn, rather than on what the use of technology is assumed to enhance.

Externality, Desubjectivisation and Closure

Two decades ago Lieras (1996), writing reflectively about his experience as an engineer, sought to explore a new emancipatory approach towards technology considering the theory of Heidegger (1954). He suggested three aspects in which our modern relationship with technology in the western world is said to be pedagogically oppressive: *externality, desubjectivisation* and *closure* (Lieras, 1996). In this section I will briefly apply the theory of Lieras to the elements that constitute TEL (technology, language and learning) to discuss: *externality* in relation to how technology seems to be treated as separate from people, *desubjectivisation* in terms of effects

from our use of language about technology that emphasises what technologies (not people) are doing and *closure* in terms of how this use of language about technology seems to restrict routes for human learning.

Firstly, the experience of technology in a relationship of *externality* means certain technological formats are imposed on people. These cut off personal creativity to permit some actions, and prevent others. The rigidity of technological systems contrasts with people's cognitive and behavioural learning styles and forces the pace that people work at (Lieras, 1996, p. 334). Technology should, in theory, save people time yet they seem to work longer hours than ever. In universities virtual learning environments (VLEs) enable some things, but prevent others. In a wider society now, we neither know nor understand the internal workings of much of the technology we use (Sennett, 2006). Yet we are dependent upon it, and without alternatives to it, should it fail. Technology is working to a calculative logic, yet it mediates much of what we do by enforcing rules. Latour cites the example of speed bumps, where a technology 'acts' to intervene and we are 'obliged to oblige it' (Latour, 2002). Objects have material, and not just symbolic effects if we do not. Damage can be done, and so we adjust our behaviour accordingly. Such examples caution us not to see technology as a 'neutral' tool for added value, *external* to us, when it is politically inscribed with real consequences for human beings.

Yet in policy language for educational technology we seem to emphasise a simple productivity gain from technology. This completely misses out the critical social interactions where we question how technology might actually yield an increase in knowledge, as a process of inquiry and critique. Furthermore, in language about teaching and learning it risks missing out people altogether, crediting our labour to technologies not humans (Hayes & Bartholomew, 2015). Understanding enhancement only in terms of added value, is restrictive, if technologies can extend us (McLuhan, 2005) to overcome endless limitations:

> Human enhancement refers to any attempt to temporarily or permanently overcome the current limitations of the human body through natural or artificial means. (Wikipedia, 2009)

If this includes the human mind, as well as body, we might say 'everything is technology' (Braudel, 1985). All around us, it shapes our history, knowledge and individual lives. We in turn shape it, in multiple ways (Wajcman, 2002). 'Things' of all types form repositories of, and for, our learning, construct our social worlds (Sezneva, 2007) and contain 'traces' of us (Lash, 2002). Given these broader understandings, human pedagogical interactions with technologies are far from simply 'enhanced', irrespective of the claims of government policies. They might be envisioned, even through a pen, which has a material significance for each of us. It can run out of ink, and thus change a course of events. It is dialectical, or mutually constitutive (Wajcman, 2002), with our practices, discourses, values, institutions, virtual environments, and all forms of apparatus (Simons & Masschelein, 2008) from which we draw meaning, whilst learning. However, to move forward as humans, the real issue involves more globally the question of 'technology's integration into society' (Matthewman, 2011, p. 38), which includes how we discuss it.

In the second aspect of oppression identified by Lieras, he pinpoints the Western conception of labour since the Industrial Revolution as leading to a *desubjectivisation*, where people's earnings become the sole reason for working and the workforce is sold in terms of time and ability. Instead of labour enabling a person to feel fulfilled in a subjective process of *revealing*, as they interact with their tools (Heidegger, 1977), they find themselves locked in a state where they themselves have become a resource, an 'object-person' (Lieras, 1996, p. 334), 'reified' (Lukács, 1971) to serve as a means to an end alongside their tools. Heidegger suggests technology in this sense is 'enframing' of human beings and reduces them to a standing reserve, in a condition of calculative thinking (Heidegger, 1977). Many have argued that we now live in an age of 'neoliberalism' (Campbell & Pedersen, 2001; Chomsky, 1999; Giddens, 1998; Harvey, 2005) that primarily nurtures liberty 'for the talented and their enterprises' (Thorsen & Lie, 2006). The emergence of our modern system of free enterprise and market-based economies has a much longer history than the focus of this chapter. It is historically relevant though, to reflect that the last 200 years, inclusive of the Industrial Revolution, have shaped the free market capitalism of our current society. Adam Smith (1776/1937) suggested the route for maximum efficiency through unrestricted manufacturing. Since then a new type of economy, where the value of goods and labour can change irrespective of their effects on social cohesion, has emerged and transformed economic life across the globe. If we accept there is now no alternative, except to live under a regime of constant accumulation and enhancement, this has consequences for elements of creative and abstract thought that are not easily quantified. Areas of our lives that do not primarily operate on 'exchange value' (Marx, 1867) and can thus, not clearly prove 'value and usefulness' (Hoedemækers, Loacker, & Pedersen, 2012) in the form of 'surplus value' (Marx, 1867) become less noticeable, easily dispensed with. In our language we may refer only to the properties of technology that are perceived as providing added value, placing emphasis on contributions from 'use of technology', rather than from the labour of humans.

The third and final point Lieras makes is closely related to this. It concerns the problem of *closure* in the human relationship between thinking and being in modern capitalist society, or in other words, people's ability to relate to the world, and the world itself. This requires 'dialoguing with our form of thinking' (Lieras, 1996, p. 336), or observing it from a distance. From this critical position, other dialogues besides an *external* position might be noticed. If we think of technology as a 'use value' rather than simply 'exchange value' (Marx, 1867) then it can be acknowledged that, like discourse, the 'in use' elements are constitutive with *all* that they touch in people's lives. Rather than understanding technology as an 'extra' (Netz, 2004, pp. 228–229), as something we merely add on to enhance learning, a stronger appreciation of the embodied nature of technological learning might be sought. From this critical position we can consider not only the 'external', utilitarian logic of neoliberalism, but also 'internal' truths and different forms of knowledge. Here, turning to Schubert's interpretation of Habermas (1971), praxis informs educational technology endeavour (Hlynka & Belland, 1991). In the technical/practical/critical trichotomy below, broader dimensions of knowledge about technology are envisioned:

1. *Technical*: the dominant curriculum paradigm.
   An instrumental 'means-end' model, of efficiency, and certainty.
2. *Situational interpretive*: the practical paradigm.
   This seeks communication of meaning among people.
3. *Critical theoretic*: an incomplete paradigm.
   This looks for emancipation from hidden human assumptions.

(Hlynka & Belland, 1991, p. 43)

Though all of these dimensions may be present, policy discourse for educational technology currently seems to overlap between the *technical* and *practical* paradigms (Hlynka & Belland, 1991, p. 44). It rarely seems to move beyond these, to seek to explore the critical theory. So often, policy describes a *single* reality, in a political context. How this reality is achieved, through the ontological politics of practice, exists in the *multiple* (Barad, 2003; Law, 2002; Mol, 1999). Yet, rather than condemn and deny calculative thought altogether, which may also be creative, it is necessary to recover *all* dimensions of human thought and practice with technology that have been narrowed through the simple 'means-end' approach. Lieras concluded that an ongoing 'work-world' dialogue could lead to internal and external empowerment. I suggest that before we can seek this dialogue we need first to confront the framework of discourse within which we have currently confined educational technology.

A Corpus-Based CDA

Whilst an analysis of discourse cannot be claimed to prove or alter anything, it offers a lens through which concrete expressions of exchange value from technology might be noticed and discussed. Our discourse about technology in learning matters because it can 'mould identities' (Massey, 2013) in narrow economically based terms, which undermines the social, political and material elements for people learning in individual contexts. This may sound negative, but critically confronting these discursive structures is not a negative activity, but rather is considered empowering to enable new conversations.

Any analysis of discourse requires first an explanation of what discourse is understood to be. The approach for CDA described here follows Norman Fairclough, to acknowledge 'a dialectical view of the relationship between structure and agency, of the relationship between discourse and other elements or moments of social practices and social events' (Fairclough, 1995). Working from the premise that texts are produced and consumed to either change or reproduce a particular meaning, these interact with societal phenomena (e.g. technology, objects, people and institutions) that are therefore not all of a linguistic, discursive character (Phillips & Jorgenson, 2002, p. 61). Discourse then is not just the study of language, but is inclusive of how people 'use it' in real life, in relation to each other and material structures. Persistent, dominant discourses in higher education policy have already been extensively critiqued through CDA (Bertelsen, 1998; De Vita & Case, 2003; Fairclough, 2007;

Mautner, 2005; Mulderrig, 2011). This has revealed how ideology can communicate *one* particular meaning in the service of power (Foucault, 1984) in a 'knowledge economy' (Jessop, 2000), and marginalise others. Gramsci's notion of hegemony (1971) shows power can operate through an internalisation of values from prevailing social discourses (Mesthrie, Swann, Deumert, & Leap, 2009, p. 316). CDA hereafter, is not a 'fixed' set of research methods, but:

> a problem-oriented interdisciplinary research movement, subsuming a variety of approaches, each with different theoretical models, research methods and agenda. (Fairclough, Mulderrig, & Wodak, 2011)

In terms of particular linguistic techniques that might be adopted within a CDA approach, there are many forms of analysis a researcher might choose. What is described below is called a 'corpus-based' approach to CDA because the examples discussed are drawn from a bank of 2.2 million words of textual data written between 1997 and 2012, known as a corpus.

A corpus is a large collection of real instances of language use. By 'real' this means that the policy documents collected were written by many human beings in different contexts and also at different times. Therefore, variety amongst the documents might be anticipated over the period scrutinised. In a first step of analysis, software called *Wordsmith* was used to notice quantitative patterns emerging through corpus linguistics (Baker, 2006). *Wordsmith* supports corpus linguistic analysis through *keywords* (Scott, 1997). Keywords are words that are statistically significant when the language under scrutiny is measured against a comparison corpus, in this case, the British National Corpus. The British National Corpus was chosen because it contains 100 million words of written and spoken English from a wide range of sources for comparison purposes. Table 2.1 shows some keywords that were highlighted and the number of times they appeared in concordance lines within the corpus.

A concordance illustrates how words and phrases are ordered alongside each other in their actual context of use. Through specific searches in Wordsmith it was possible to take a closer look at words that appeared both before and after the keyword 'use'. 'Use' was chosen as a focus to examine more closely, given the emphasis placed above on 'enhancing learning through the use of technology' (JISC, 2009–2012).

In Fig. 2.1, some concordance lines from the corpus are shown. Bold text highlights instances of *the use of technology*. This phrase is often followed, or preceded, by an expectation *to enhance* or *improve* (these instances are underlined) a form of *learning* (denoted in italics).

The regularity of the patterns in Fig. 2.1 above demonstrates an assumption that in exchange for 'the use of technology' there will be enhanced forms of student learning. These example structures were often repeated in the corpus and therefore a closer analysis through CDA was undertaken. CDA provides a more qualitative way to examine, not only how language is structured across *concordance* lines of policy text, but also what sorts of values are implicit in these statements. One way to approach CDA is to look at what seems to be taken for granted grammatically in language by undertaking a *transitivity* analysis (Halliday, 1994). The idea

Table 2.1 Example
keywords from the corpus

Keyword	Number of instances
Learning	19,260
Use	8,131
Technology	6,079

5659	**the use of technology** <u>can increase</u> *accessibility and flexibility of learning*
5660	**the use of technology** <u>to create</u> *digital archives to improve practice*
5661`	**the use of technology** <u>to enhance</u> *front line productivity and management*
5665	the agenda <u>to enhance</u> *learning and teaching* through **the use of technology**
5677	produce resources and advice on **the use of technology** <u>to enhance</u> *assessment*
5680	<u>enhancing</u> their skills and confidence in **the use of technology** <u>enhanced</u> *learning*
5681	<u>to enhance</u> **the use of technology** *in learning and teaching* and to facilitate a more
5682	to share information and drive **the use of technology** <u>to enhance</u> *learning*
5683	<u>to improve</u> *the student learning experience* through **the use of technology**
5684	**the use of technology** <u>to achieve</u> *novel and effective learning experiences*
5686	support for **use of technology** <u>to enhance</u> *the learning and teaching experience*

Fig. 2.1 Concordance lines of policy text showing patterns of keywords

from Systemic Functional Linguistics that the system of language is shaped by the function it serves (Halliday, 1994) stresses the social character of texts. For Halliday (1994) language is a system of options from which writers *choose*. These choices are always significant and arguably often ideological (Simpson & Mayr, 2009, p. 65). Transitivity analysis is concerned with how meaning is represented through the use of nouns and verbs in the English language to express who is doing what to whom in particular statements. This raises the question that whilst this may be useful in English, what about in other languages? However there has been an assumption in policies across the globe that English *is* now the language of technology, for other countries to adopt if they wish to secure greater opportunities for learning (Seargeant & Erling, 2011, p. 259). For this reason alone it is necessary to pay attention to how statements in English structure our understanding of technology and to consider ways this may perhaps happen in other languages. Through transitivity analysis we can map the 'circumstances of place and time within which events occur' (Fowler, 1986, p. 156) and the *participants, processes* and *circumstances* involved (Halliday, 1994). In Table 2.2, these are shown to be realised in texts by nouns, verbs and adverbs.

Before discussing some particular structures from the corpus in more detail it is worth providing a few generic examples to demonstrate how transitivity analysis works in practice. In Table 2.3 a statement is made: *A student is learning at university.* The components of this statement are broken down and described. 'A student' is labelled as a *noun*, because this is a named participant undertaking this process. The process: 'is learning' is labelled as a *verb* and the circumstance 'at university' is acknowledged as an *adverb*. Some things to notice here are that in this sentence

Table 2.2 Transitivity elements (Halliday, 1994)

Element	Realised by
The participants (*who, whom*)	Nouns
The processes (*what*)	Verbs
The circumstances (*how, where, when*)	Adverbs

Table 2.3 An example of transitivity analysis

A student	*is learning*	*at university*
Participant (noun)	Process (verb)	Circumstance (an adverb)

Table 2.4 One way we might re-write the statement in Table 2.3

Universities	*are*	*places of learning*
Participant (noun)	Process (verb)	Participant (noun)

the participant, or the actor undertaking the process of learning is clearly stated. We know *who* is doing the learning and therefore agency is clear. Yet this activity could be rewritten less transparently, as shown in Table 2.4.

In Table 2.4 there are similar components to label, but some aspects have been missed out. For example, to reveal a human subject, more information is required. In relation to *places of learning*, to whose learning are we actually referring? The people involved in the learning are not mentioned. Following the work of Halliday (1994), to undertake a transitivity analysis, the different process types (verbs) are labelled to show what types of actions these represent. For example, a *Material* process is a physical act of labour undertaken by an *Actor* (whether human or not) to meet a *Goal*.

In Table 2.5 it is clear to see that 'Brian' is the *Actor* undertaking a *Material* process: 'is using' and the Goal is: 'the Internet'. Whilst it may seem a little strange that the *Goal* in this example is 'the Internet', it is worth adding that through the process 'is using', 'Brian' is understood to be acting upon 'the Internet'. This becomes more significant if we think of transitivity analysis as a way to reveal agency (which refers to the capacity of individuals to act independently and to make their own free choices). In this example 'Brian' is the person with agency, or capacity, to act. If, however, as in Table 2.6 we simply state that 'the internet' 'enhances' 'learning', we attribute agency, or the capacity to act, to 'the Internet', not Brian.

This form of writing is known as *Nominalisation*, or the use of nouns that represent actors and processes in ways that hide agency (Crossouard, 2004, p. 6; Fairclough, 2003, p. 220). Though common in reports and scientific documents, nominalisation has ideological consequences, when, for example, ideas about learning and technology become described as *facts*, and the labour involved is not attributed to people. Discussing some further processes that might be noticed through transitivity analysis should help to clarify the importance of these points.

A process of 'believing' would be described as a *Mental* process, but *Mental* processes are labelled slightly differently, as shown in Table 2.7.

In Table 2.7 'Brian' is the *Senser* (rather than the *Actor*) undertaking a *Mental* process: 'believes'. 'Technology enhances learning' is called the Phenomenon (rather than Goal). Here again we might consider that 'Brian' has the capacity to

Table 2.5 How a 'Material' process is labelled in transitivity analysis to show Actor and Goal

Brian	is using	the Internet
Actor	Material process	Goal

Table 2.6 The Internet is now the Actor that enhances the Goal of learning

The Internet	enhances	learning
Actor	Material process	Goal

Table 2.7 How a 'Mental' process is labelled in transitivity analysis

Brian	believes	technology enhances learning
Senser	Mental process	Phenomenon

Table 2.8 This strategy is now the senser that believes technology enhances learning

This strategy	believes	technology enhances learning
Senser	Mental process	Phenomenon

undertake this process of believing something, but it would change the meaning considerably if, as in Table 2.8, in place of 'Brian' we were to insert 'This Strategy', which would then attribute agency, or capacity to believe, to a strategy: 'This Strategy believes technology enhances learning'.

A process of 'speaking' would be described as a *Verbal* process in Halliday's method. In Table 2.9 'Sarah' is now the *Sayer* in a *Verbal* process: 'criticises' and 'the procedure' has become the *Target*. Yet to rewrite the statement in Table 2.9 as shown in Table 2.10, to replace 'Sarah' with 'This document', changes who is responsible for criticising quality control procedures.

Transitivity analysis then enables a closer look at the way our social context of educational technology in higher education is structured through the choices of words people use to write policy. In examples of nominalisation above, where statements are not attributed to people, but to 'things' such as 'this document', these ideas are not easy to argue with. Such declarations can shape human activities within a restricted world view through use of language. By looking closely at the choices people make in how they structure what they write, we can notice '*who* does *what* to *whom*' (Thompson, 2004) within policy texts. This can help to illustrate the interplay of economic, social and the political elements, in discourse about learning with technology. From here we might notice if rigid statements close rather than open conversational spaces to discuss the role of technology more broadly for learning.

Table 2.9 How a 'Verbal' process is labelled in transitivity analysis

Sarah	criticises	the procedure
Sayer	Verbal process	Target

Table 2.10 This document is now the Sayer that criticises the procedure

This document	criticises	the procedure
Sayer	Verbal process	Target

The Consumption of Space for Alternative Discourse

Now that the principles of transitivity analysis have been explained, this section explores some real examples of *Material, Mental* and *Verbal* processes from the UK corpus and then some statements from policy reports from other countries. In Table 2.11 some corpus lines from Fig. 2.1 have been analysed. Firstly, we can notice how 'the use of technology' is a *nominalisation*. In row *5659*, instead of a discussion where a human agent can be identified through a verb as *using* technology, a detached expression of 'the use of technology' takes the place of a person, or participant and becomes the Actor. We are told through a *Material* process that 'the use of technology' 'can increase' the Goal: 'accessibility and flexibility of learning'. In corpus row *5660* the same structure is repeated and this time 'the use of technology' is said 'to create digital archives to improve practice'. In row *5661* 'the use of technology' is claimed 'to enhance frontline productivity and management'.

In each of these cases 'the use of technology', is the Actor that is said to undertake a *Material* process that can 'increase', 'create' or 'enhance' the Goals shown. This is a repeated pattern where the writer assumes 'the use of technology' is something external to people that might be applied to yield each of these exchange values. Whilst nominalisation is a feature of academic writing, when overused in this fashion it has the real effect of turning active human labour into a form of commodity. If this were phrased differently, we might identify *who* is *using* technology to achieve *what*. Instead the human labour process of *using* technology becomes a noun, when stated as 'the use of technology'. This in a sense freezes and repackages the way in which the concept of technology is experienced by a reader.

In the next example in Table 2.12 a *Verbal* process: 'proposes' is enacted by 'the strategy'. Once more a great deal is being attributed to a document, including the human labour required to 'enhance the learning opportunities of all learners' and to decide on 'the appropriate use of e-learning'.

In the next two examples, *Mental* process is shown. Firstly in Table 2.13 we can notice that the Mental process shown is undertaken not by a human subject but by 'this strategy' which 'focuses on how technology can enhance learning, teaching and the overall student experience'.

Table 2.11 Transitivity analysis shows Material processes

5659				
The use of technology	can increase	accessibility and flexibility of learning		
Actor	Process: Material	Goal		
5660				
The use of technology	to create	digital archives	to improve	practice
Actor	Process: Material	Goal	Process: Material	Goal
5661				
The use of technology	to enhance	frontline productivity and management		
Actor	Process: Material	Goal		

Table 2.12 Transitivity analysis shows a Verbal process

588			
The strategy	proposes	to enhance	the learning opportunities
Sayer	Proc: Verbal	Proc: Material	Goal

of all learners	through the appropriate use of e-learning
	Circumstance

Table 2.13 Transitivity analysis shows a Mental process

5701		
This strategy	focuses	on how technology can enhance learning, teaching
Senser	Proc: Mental	Phenomenon

and the overall student experience

Next in Table 2.14 the same pattern is repeated as another *Mental* process: 'strives to' is undertaken by 'this strategy for e-learning'. It is not possible to determine who holds these views because, via *nominalisation*, this information is concealed. In both of these examples it can also be noted that any enhancement of student learning is described as 'to enhance the student experience', expressing what students encounter individually, as if it were a commodified single experience, rather than a diverse and personal one.

Though the activities described will naturally involve human labour this becomes 'reified' as if performed by 'things'. The work of people is desubjectivised. Discussed in terms of objects, the subjective, social aspects that might underline plurality, or diversity, are omitted. All eventualities have been covered and further input is not invited. Yet written differently, this might have read: 'tutors are striving to realise a vision'. The next few examples are not from the UK corpus. Firstly, from the USA, in Table 2.15.

Table 2.14 Transitivity processes = Mental, Material, Material

5224		
This strategy for e-learning	strives to	realise the following vision
Senser	Process: Mental	Phenomenon

to use	e-Learning	to enhance	the student learning experience
Process: Material	Goal	Process: Material	Goal

Table 2.15 US Department of Education, Office of Educational Technology (2010)

The use of educational technology	to improve	teaching, assessment, learning, and infrastructure
Actor	Process: Material	Goal

Table 2.16 European Commission

The use of ICT	to support	innovation and lifelong learning for all
Actor	Process: Material	Goal

The use of new multimedia technologies and the Internet	to improve	the quality of learning
Actor	Process: Material	Goal

The use of ICT to support innovation and lifelong learning for all (2008)

Table 2.17 European Commission (2009)

Technology-enhanced learning	is transforming	education and training
Actor	Process: Material	Goal

to	make it	more effective, more attractive, more accessible and more adapted to today's contexts
	Process: Material	Goal

In this statement it is 'the use of educational technology' that *acts* to undertake a *Material* process 'to improve' the *Goal* of: 'teaching, assessment, learning and infrastructure'. This expected improvement represents an exchange value for 'the use of educational technology'. In Tables 2.16 and 2.17 examples of *Material* processes from European Commission reports demonstrate similar positive expectations from 'The use of IT', 'The use of new multimedia technologies and the Internet' and, as discussed earlier, 'TEL' to support, improve and transform.

   What can be noticed from these examples is just a small section of a pattern that emerges across the UK corpus and can also be found repeated in strategy documents more globally. The use of some form of technology is very often repeatedly followed by what I have referred to as an 'exchange value' in terms of learning. Use of technology, as an external force is expected to 'increase', 'create', 'enhance' and 'improve' learning. In our market-driven workplace we expect a surplus from technology for learning, but humans are rarely mentioned in this calculation. If we reflect on the theory of Marx, it is humans though, is it not, that provide labour? (Marx, 1867) Humans design and programme technologies, teach classes and study at university. Yet in our policy for learning via technology we seem not to feature, instead we seem to simply count on 'the use of technology' to enhance learning.

Discussion

Fundamentally, the transitivity examples provided above help to demonstrate how policy discourse can limit choice. These are representations of what *should* happen in learning encounters with technology, rather than what *does*. Rather than acknowledging the 'things' that are encountered by people in real, material, learning situations, technology is treated as an 'external' means to deploy for efficient processes. Yet social relations are discussed as 'things' and human agency becomes hidden from view. This is a curious reversal, where 'reification' Lukács (1971) means that human relations become traded objects, through 'commodity fetishism' (Marx, 1867). The natural activities of people learning, using technology, become separated from their original context. They are given new generalised attributes, which in reality in numerous contexts, they cannot possibly have. The paradox is that these rules dictate how we should learn using technology, and thus limit what might be envisioned. Such textual arrangements need not be intentional. However, collectively and globally, we build a 'fixed' impression of educational technology through policy of which we need to ask critical questions. If we do not, we expect students to learn in only one way, and technology to be a predictable tool that supports this.

   Due to constraints of space only a few examples of policy texts, from the UK, the USA, and Europe have been examined in this chapter. In order to draw further evidence from across the globe, a much larger study would be necessary. This could classify the types of transitivity processes that can be repeatedly noticed in policy documents and build a clearer picture of how technology is frequently evaluated. This would enable a fuller consideration of the ideological presuppositions that are transmitted to construct a particular version of reality.

   Emphasising a simple productivity gain from technology, through TEL, is not the only way to understand how technology and learning might be linked. If we rely on TEL to account for how learning takes place, we risk our own human interactions being omitted from this discourse. In the next section I propose another way to think about the interrelated nature of technology, language and learning.

A Technology-Language-Learning Nexus

In contrast to the discourse of TEL, which suggests there is no need for further debate about what technology achieves in learning, some have described the process of coming to 'know' through educational technology as more of an ongoing 'conversation' (Laurillard, 2002; Sharples, 2005). This suggests the active involvement of humans in a dialogic exchange where technology is not simply an external extra with the subjective social aspects omitted (Lieras, 1996). Such a conversation is contrasted with an assumption in policy language that implementing new technologies, in themselves, determines learning. Yet in the decade since 2002, we do not seem to have had the multi-directional conversation that was once envisioned through *Networked Learning*. If we do not begin to question how teachers and students are now positioned within discursive practices like TEL then we miss noticing significant, related power and knowledge relations. Networked Learning is a term that does not presuppose an exchange value from technology for learning. In this sense it makes no promises, which is perhaps a good place to start. It enables a more holistic perspective to be contemplated where human labour with technology, language and learning are integrated with social change, but there are no guarantees of simple outcomes from technology itself. Instead we might consider how, in broader society, technology intersects with political ideals, sociocultural practices, and is discussed for the purpose of learning, through discourse.

For understanding *language*, humans have developed terms to distinguish different aspects. Discourse is the 'in use' element of language and, as such, is a broad concept, because it co-evolves with all other elements it touches in society. For *technology*, there are less adequate terms for its heterogeneous and temporal qualities and our own levels of understanding. It presents a problem for *learning* though, if in language, these elements of technological knowledge cease to exist, and technology means only constant improvement.

The practical and theoretical elements of *language* and *technology* are inextricably intertwined and linked also with the human beings who write policies, provide support, teach courses or access these, in order to learn. The manipulation of educational technology is therefore an ongoing political struggle, not a linear calculation. Yet, little of the critique of modern capital can be found in post-Internet educational technology literature. This seems to have concentrated on more practical applications of technology, in terms of case studies and facilitation of practice.

More critical pedagogical accounts of education (Freire, 1972; McLaren, 1994) do not seem to have featured prominently in educational technology literature of the new millennium. For example, Gee (2000) described the 'communities of practice' approach (Wenger, 1998), though identified with liberal approaches in education as also driven largely by businesses (Jones, 2001). Equally, more critical linguistic accounts of educational discourse (Hasan, 1998) have not necessarily pinpointed the language in which we discuss technology for learning as problematic. This leads into the paradox that, whilst humans intimately connect to technology, they may yet fail to recognise the politics and social interests that technology embodies. If the

political choices that drive agendas for technology in Higher Education are not rec-
ognised, this then makes it challenging to imagine alternative more plural visions.

Our current policy discourse seems to support a compressed version of how
students might experience technology, language and learning, confining these ele-
ments along a very narrow TEL route. To re-envision this it is necessary to under-
stand the relationship between *language* and power, which is constituent with all it
touches, including *technology* and *learning*. I therefore propose that in educational
technology there is a convergence of the elements of technology, language and
learning that can offer a fertile theoretical basis for networked learning research.
Through networked learning the *sociolinguistic* and *socio-technical* elements of
technological learning might be explored, together, with the *critical pedagogical*. I
call this an awareness of the *technology-language-learning* nexus, that is played out
through the discourse of TEL, but TEL is too narrow a concept. *Networked Learning*
provides scope for a dialogue across all of these areas. Therefore the following con-
clusions invite further research into a *technology-language-pedagogy* nexus that
appears to be played out globally through TEL.

Conclusion

Currently, in policy discourse educational technology is treated as a subdiscipline to
education, but it needs to be acknowledged by universities as much broader than
this. As a sociocultural practice, this emerging field of research is a source of aca-
demic knowledge that could develop diverse links between the socio-technical,
sociolinguistic and critical pedagogical, within what I have called the *technology-
language-learning* nexus. It is potentially disruptive, to move beyond the narrow
discourse of current policy but it may provide us with liberation from one-dimen-
sional assumptions about technology, as purely a means to an end. I have argued
that for too long the discursive construction of policy texts has shaped the way
educational technology in Higher Education has been represented. This prioritises
one narrow economically linked view of reality, but marginalises *others* (Pearce,
2004). It structures a pathway of objective goals, such as improved processes, for
productivity, redesign and transformation of our education systems. Yet, it misses
out real, subjective goals of learners and teachers in their diverse material encoun-
ters with technology through *nominalisation*. This structures important processes as
if they were undertaken by entities, not people and provides a vehicle for either
strong hierarchical, or neoliberal agendas to make simplified claims politically, in
the name of technology.

In a CDA I have demonstrated how *transitivity* analysis can reveal the linguistic
choices that position people and technologies to maintain a restricted version of our
practice. Whilst technical understanding is important, it is just one of the three forms
of cognitive interests: *technical, practical* and *emancipatory* (Habermas, 1984) con-
stitutive of knowledge. Furthermore, to focus only on the instrumental, or technical
model alone, risks assuming that there is a general route to success in enhancing
learning, through *the use of technology*. This fails to consider diverse and unequal

contextual circumstances locally, and globally. It implies there is only one model that can be repeated anywhere. Yet, any *technology* might evolve differently (Matthewman, 2011, p. 27). *Language* varies according to location, and the semiotics of each culture, which can be observed even at the level of grammar. *Learning* too, is situated, and whilst policy may refer to 'the student experience' as an objective, there are *many* student experiences, and all of these are subjective. Given these points, a critical awareness of the convergence of *technology, language* and *learning* within the interdisciplinary field of educational technology enables us to move from a one-dimensional model, towards a multi-dimensional *networked learning* approach.

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