# ICT and Social Justice: Educational technology, global capital and digital divides

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## Abstract

*This paper will present a Marxist analysis of the current function and role of information and communication technology (ICT) in education, with specific reference to schooling in the UK. Over the past five years the UK government has spent in excess of £2.5bn on ICT equipment for schools and in 'training' teachers to use the technology. Children and teachers are now clearly expected to function and develop within an online community and network, whilst schools are appraised, judged, measured and regulated through a series of online reports, league tables and data available to those with access to the internet. The paper will consider the implications of this significant increase in spending on technology and the promotion of ICT in schools, the links with global capital and the benefits for capitalism of the trend towards digital and electronic communication. Five enduring myths about the provision and use of ICT for educational 'benefit' are explored in order to develop*

*a critical understanding of the ways in which ICT is used to reinforce state apparatus and redefine social and cultural practices within education. The paper will also contend that the apparent systematic exclusion of visible minorities and much of the working class from ICT orientated research is central to the maintenance of status quo and power and 'conservative whiteness' in technology education.*

## Introduction

This paper aims to provide a critical evaluation of the use and pedagogy of educational technology, with specific reference to the UK. Over the past five years the UK government has spent in excess of £2.5bn on information and communication

technology (ICT) equipment for schools and in 'training' teachers to use the technology. In 2005-6 alone, £700m was allocated for ICT in schools (DfES 2005) and it has become the norm every January at the British Educational Technology Exhibition (BETT) for the Minister for Education to announce further significant government spending on ICT.

The official position has changed from 'recognising the potential of ICT' (NGfL, 1998) to 'embedding in ICT educational practice', allocating ICT a crucial role in whole school improvement (DfES, 2003a: 6), positioning 'ICT as integral to the drive for quality' (Ofsted, 2004) and 'providing an Excellence Gateway to develop excellent provision for the learner' (Becta, 2006a). As we move from 'e learning' (electronic learning) to 'm learning' (mobile learning), using 'flexible networking' involving small, mobile multi-function devices with 'open source software', and out of the computer suite and into the classroom (not before time), there is a need to comprehend the accelerating technological change in our daily educational and working lives. It is argued here that a critical Marxist perspective is essential to this understanding.

The following five enduring myths about the provision and use of ICT for educational 'benefit' are explored in order to develop a critical understanding of the ways in which ICT is used to reinforce state apparatus and redefine social and cultural practices within education:

1. 'Technology is neutral';
2. 'Placing technology in schools and classrooms leads to automatic learning gains';
3. 'Giving teachers access to educational technology makes them more professional and efficient';
4. 'Equipping schools increased ICT leads to school improvement';
5. 'Students need to have technological literacy in order to be employable'.

Toffler (1970: 361) suggested that Marxism is a 'misleading and obsolete' tool for understanding reality in a high technology world. However, as Derrida (1994: 8) has argued, rather than Marxism being rendered obsolete by the information age it is only in the light of certain 'informational' developments - such as Globalisation, the pre-

eminence of the media and call centres, etc - that we can see the full importance of certain themes within the texts of Marx. The emphasis on internationalisation and automation of production is important here. For example, Marx in *Capital* (1977) offers an historical analysis that locates the origin of the information society in the conflict between labour and capital that is directly related to a consideration of class composition in a digitalised era. In particular, a Marxist position offers a critical understanding of the ways in which ICT is used to reinforce state apparatus and redefine social and cultural practices within education, the international dimensions of resistance to the expansion of high technology capital, Globalisation and the central role of new communication technologies. This paper will also contend that the apparent systematic exclusion of visible minorities and much of the working class from ICT orientated research is central to the maintenance of status quo and power and 'conservative whiteness' in technology education.

Children and teachers are now clearly expected to function and develop within an online community and network, whilst schools are appraised, judged, measured and regulated through a series of online reports, league tables and data available to those with access to the internet. The DfES (2003a: 6) argues that the case for the use of technology is made – it is just a question of identifying and disseminating 'best practice' with ICT. However, as Castells (1999: 38) states, 'the brightness of rising star blinds observer'. Following Apple (2003), the questions we should be asking involve not how to use the technology but:

- Where did the direction to use ICT come from?
- Who really benefits from the use of ICT in education?
- Why use ICT?
- Why has the increased use of ICT in education made little impact on the pedagogy of teaching and learning?
- And what is the impact of ICT on our daily (working) life?

This paper will therefore examine the structural position of educational technology in a post-industrial information based economy and as a crucial apparatus for the maintenance of information-based global capital. As McLaren and Farahmandpur (2002: 41) point out, computer technology has led to an 'automation of labor making it more productive and efficient, whilst at the same time cheapening it'.

Whilst the paper takes a critical standpoint challenging the view that ICT is intrinsically beneficial to the process of education it is not a wholly technosceptical stance. A neo-Luddite position is not advocated and it is acknowledged that recognition should be given to innovative and useful educational practice in the context of ICT at local, national and international level. Paradoxically, there is the need to consider the possibility of technology as a site for resistance to global capital and the promotion of social justice within education (see, for example, Cleaver, 1999 and Suoranta, 2003).

## ICT, the global economy and the circuit of capital

Global capitalism is predatory and parasitic. In today's global economy, capitalism is less benign, less responsive to the interests of broad majorities around the world, and less accountable to society than ever before. Some 400 transnational corporations own two-thirds of the planet's fixed assets and control 70 percent of world trade. With the world's resources controlled by a few hundred global corporations, the life blood and the very fate of humanity is in the hands of transnational capital, which holds the power to make life and death decisions for millions of human beings. Such tremendous concentrations of economic power lead to tremendous concentrations of power globally. Any discussion of 'democracy' under such conditions becomes meaningless ... (Robinson, 1996: 20-21)

Modern global capitalism requires information to function. However, corporate international business not only thrives on new technology, but also owns it and exerts power through it. The predatory and parasitic success of global capital as identified by Robinson (1996), above, has been achieved through and because of the 'Wired Society', the 'Information Revolution' and the 'New Information Age'. The greater the acceleration of technological change in daily, working and educational lives the greater the need to challenge the view that 'machines are the real makers of social change' and ask questions about who really benefits from the vast amount of money spent by individuals and governments on new technology and, who is included and excluded as a result. For example, the US army is the world's biggest computer games developer, pumping billions into new software in order to boost recruitment (O'Hagan, 2004).

## Challenging technological determinism and technological fetishism

Marx wrote of technology:

> Nature builds no machines, no locomotives, railways, electrical telegraphs, self-acting mules etc. These are products of human industry: natural material transformed into the organs of the human will over nature, or of human participation in nature. (Marx, 1973: 706)

As Dyer-Witheford (2000: 79) argues, Marxism does not take a deterministic view of technology. Whilst recognising the profound social consequences of technological change, Marxists emphasise the potential of the struggle between labour and capital for both domination and liberation. Marx (1977) argued that as capitalism deepens control of the workplace, society transforms methods of production. The impetus for this development is the factory owner's drive to enhance control over the workforce by deskilling the workforce. It is the need for capital's requirement for total control that shapes machines not vice versa. Thus, Marx counters the technologically determinist account.

Criticism of technological determinism is also made by Kellner (2000), Norris (2001) and May (2001). They stress that the meaning of technology is not to be found in technology itself, but arises from its usages and the cultural-political context. Noble (1993) contends that technology is not an irreducible first cause: its social effects follow from social causes that brought it into being: behind the technology that affects social relations lie the very same social relations. Further, Hand and Sandywell (2002: 198), argue that 'Where information technologies have been singled out as key causes of progressive change and democratic enlightenment, we not only have an instance of ideological simplification but also an advanced form of technological fetishism.'

However, as Dyer-Witheford (2000) argues a further more complex explanation is needed. Three concepts from Marx are now briefly considered to help examine the position and significance of educational technology.

## Commodification

Firstly, the world market is now enabled by computer networks, satellite broadcasts and high-tech weaponry. This is a system based on universal commodification. Commodification involves an emotional attachment to the technology and what Dyer-Witheford (2000) identifies as 'the buying and selling of life-time'. He argues that all activity is subordinated to the law of value - the socially imposed law of exchange. 'Only money talks'. This 'reductionism classifies humans only in terms of their labour power and consumption capacity leading to the exploitation of labour, alienation, dehumanising mechanisation, centralisation and concentration of wealth' (*ibid*: 14). The constant re-inventing of technological 'necessities' to sustain capital, such as home cinema, digital photographic suites, WAP phones and broadband, etc leads to consumerism on a global scale that involves a reconstruction of the needs and desires of cultural traditions, religious prohibitions and dietary habits, etc, - the 'Californiacation' of culture all over world. Relevant here is Marx's description of the 'circuit of capital' (1977: 198). Capital depends on its operations not just on the exploitation in the immediate workplace, but on the continuous integration of a whole series of social sites and activities – sites which may however become scenes of subversion and insurgency. The 'information age has not transcended the historic conflict between capital and labour but rather constitutes the latest battleground in their encounter' (Dyer-Witheford 2000: 198). Since Marx proposed this model capital has considerably expanded its social organisation. Currently, this circuit of accumulation and resistance 'passes through robotised factories, interactive media, virtual classrooms, biotechnological laboratories, in vitro fertilisation clinics, hazardous waste sites and out into the global networks of cyberspace' (*ibid*: 14). However, as Dyer-Witheford asserts, the paradox is that arising out of this process appear forces which could produce a different future based on the common sharing of wealth. As Wilson (1997: 11) points out, 'there is no technical reason why in each village and town on earth there should not exist a link to a worldwide computer network. From the network anyone would be able to obtain, in a few minutes, a copy of any book ever published, any piece of music ever recorded, any film or TV programme ever made. The educational and cultural opportunities which such a system would bring to billions of people are beyond imagining. Yet such a system could only be built in a socialist society'.

## Information and information flows

Castells (1996: 17) stresses the meaning of information and information flows. In the industrial mode of development, the main source of productivity lies in the introduction of new energy sources, and in the ability to decentralise the use of energy throughout the production and circulation processes. In the new, informational mode of development the source of productivity lies in the technology of knowledge generation, information processing, and symbol communication. In other words, the flow of information. For Lash (2002: 6), the'logic of manufacturing is giving way to the logic of information'. Work and production processes are no longer labour-intensive, but information, knowledge and design intensive. As a result ' the social is being displaced by the cultural: where the social constituted action tied to place and tradition, in the world of wired connections, the cultural flows freely as money, ideas and popular images (*ibid*: 26). Hence, the 'Californiacation' of culture.

**The Socialised Worker**

Negri (1989: 116) puts forward the concept of the 'socialised worker'. The raw material on which productivity is based in the 'factory without walls' is science, communication and the communication of knowledge. To secure this capital must appropriate communication. It must control the communicative capacity of the labour force making it flow within the stipulated technological and administrative channels. Communication is to the socialised worker what the wage relationship was to the mass worker. This does not mean that TV programmes replace pay. Rather, Negri is suggesting that communicational resources now constitute part of the bundle of goods and services capital must deliver to workers to ensure its own continuing development. This information is centralised and hierarchic. Schiller (1989) argues that we are not witnessing the transcendence of capital into an individualised electronic global commune but a push towards corporate controlled information society. A proliferation of technologies and channels does not democratise and diversify opinion formation. Schiller argues that giant media corporations generate, filter, and refine the flows of imagery, news, entertainment to exclude anything that might subvert the interest of owners or advertisers and to systematically intensify the commodification of social relations. For Schiller the consequence is a national discourse that is increasingly one dimensional and the systematic envelopment of human consciousness by corporate speech, a further example of 'Californiacation'.

## Digital Divides

There is not one, but multiple divides caused and reinforced by global capital's control of new technology. There is a tendency to assume that the 'World Wide Web' means that the whole world is connected to the Internet but approximately 96 per cent of the world's population is not. In a current world population of 6 billion, less than one billion people have regular access to computers. In wealthy countries there are 563 computers per 1000 people but in less wealthy countries only 25 per 1000 people (Social Watch, 2006). There are clear divisions based on class, 'race', gender, age and geography. Castells (2001) has argued that the Internet is not just the message of our time - it is the medium that forms the fabric of our very lives. For Castells, the network represents the leading idea of our era and functions as a metaphor extending its influence to various aspects of human activity. 'Core economic, social, political, and cultural activities throughout the planet are being structured by and around the Internet, and other computer networks. Exclusion from these networks is one of the most damaging forms of exclusion in our economy and in our society' (2001: 3). A further division is in the ownership, access and use of new digital technology, a division which is unsurprisingly based on class, 'race', and gender.

The reality is in the data:

- More than half of the world's citizens have never used a telephone, only 7 per cent have access to a personal computer and only 4 per cent have access to the internet.
- Today over 600 million people use the internet, having grown from less than 20 millions only five years ago. By 2005, there are forecast to be one billion internet users.
- In 2000 there were 214 countries connected to the internet – up from 60 in 1993 and just eight in 1988. (Doering et al., 2003)

More than 600 million people worldwide have some sort of access to the internet. It reflects the rapid growth of the network since it was invented in the 1970s. However, there are still about 5.5 billion people who do not use the net and who have no access. Most of these people live outside the 'developed' Western countries. While over half of UK households are online, only 0.1 per cent of homes in Bangladesh can claim the

same. As the cost of computers and of network connectivity has come down in the West, there is an unexamined assumption that the network is on its way to being generally available to all who want it. This is not the case. The gap in the access to and use of the latest information and communications technologies - computers, mobile phones, digital networks, even interactive television - is as wide as ever, and the consequences are being felt in all the poorer parts of the world (Doering et al., 2003).

In the UK there is evidence of a class, race and gender based access and use of ICT, both at home and at school. National Statistics (2006) show that an estimated 13.9 million households (57 per cent) in Great Britain could access the Internet from home between January and April 2006. This is an increase of 2.9 million households (26 per cent) since 2002, and 0.6 million (5 per cent) over the last year. The region with the highest percentage of households with Internet access was the South East with 66 per cent. The area with the lowest access level was Scotland with 48 per cent. In June 2006, broadband connections formed 72.6 per cent of all Internet connections. According to Owen (2003), white families are far more likely to own a computer. Black people living in deprived areas have less access to home computers than their white neighbours. However, ethnic minority families with a PC were more likely to use it for work and education. White households, though, were more likely than others to surf the internet. Minority ethnic groups, as a result, had less access to government online services and home shopping. The survey, of 1,585 households in deprived areas, found that 37 per cent of white families owned computers, compared with 31 per cent of black families. The figure among Asian families was 42 per cent, but this group was less likely than others to use the internet. The overall proportion of UK families owning a computer was 50 per cent in 2001, according to government figures. Minority ethnic groups were much less likely than white people to use them to buy goods or services – 25 per cent compared with 42 per cent. Meanwhile, only 20 per cent of Asian people and 26 per cent black people questioned had used computers to access government services on line. The figure for white respondents was 34 per cent. Further, The Office for National Statistics (2002) found that children of single parent families were significantly less likely to have access to home computers and the internet. Just over half the children in lone parent families were likely to have a computer, compared to eight out of 10 in two-parent households. Only 36 per cent of

children in single parent households had internet access - with almost double that number able to surf the net in two-parent homes.

A recent example of the division between schools is evident from information on broadband connectivity. The plan was to connect all schools to broadband by the end of 2006 (DfES, 2003a). However, according to (Becta, 2006a: 7) ‘a substantial minority of schools still do not have broadband access, while others have lower specifications with bandwidth that is insufficient for their needs’.

**A Marxist analysis of educational technology**

Global capital has subjugated technology for its own ends and has sold the ‘miracle of technological benefits’ to the educational world. It has persuaded us to pay for it through powerful advertising. Parents and schools now have a moral duty to provide the ‘best’ kit, whatever the cost. In addition, the promotion of educational ICT has led to the coupling of home and school markets (Apple, 2003). The advertising and promotion of the educational possibilities with ICT has helped to increase advantage due to wealth and is a major contributor to digital divides (see above). As Dyer-Witheford (2000: 245) points out, ‘electronic capital’s expanding media reach meant it exploited not just labour power in the factory but also ‘audience power’ in the home’. Whilst interactive media systems make it possible to transmit back to the corporate provider detailed information about the consumer’s identity, location, consumption habits, they also provide comprehensive information about consumer behaviour leading to highly targeted marketing. This is one of the features of what Schiller (1989: 97) has identified as a push towards a corporate controlled information society. Schooling and education are a significant part of this society.

Not only has the actual provision of educational ICT significantly increased over the last ten years, but at the same time there is pressure on educators to make corporate business needs the primary goals of the school system. For Apple (2003: 442), the language of efficiency, accountability and targets is defined by powerful groups and has become the way we think about schooling. In the UK, school ‘league tables’, national tests (SATs) and inspection (Ofsted) reports are published online and then reproduced uncritically in the local and national press. Teachers are now expected to promote ‘e learning’, develop ‘e confidence’ and organise Managed Learning

Environments (MLEs) (Becta, 2004a). In addition, from 2006 schools, teachers and local authorities are expected to engage in 'self-review' of the ICT use, strengths and weaknesses (Becta, 2006b). Also, they are expected and encouraged to purchase ICT through 'informed procurement' (DfES, 2003a, Becta, 2004a). Further, educational technology, as part of the state apparatus, is increasingly used for used for control and surveillance in the form of electronic registers and logs, online tests and exams for children, student teachers, teachers and managers (Cunningham et al., 2004).

At the same time as the provision and promotion of educational technology has increased significantly, the expectation that children will be encouraged and taught to critically evaluate its use has been significantly decreased within the curriculum. The original National Curriculum in England (DES, 1989) identified five strands for Information Technology including a distinct strand concerning the application and effect of ICT in society. However, following the Dearing Review (DfEE, 1995) and new curriculum in 2000 (DfEE/QCA, 1999 and QCA, 2005) the current focus is almost exclusively on technical competence and it is only at level 6 that students expected to discuss the wider impact on society. Whilst the curriculum has moved from Computer Studies to ICT Capability to 'e learning' and 'm learning' the requirement for children to be taught critical awareness of the use and impact of technology has been removed. As ICT has been given a more significant role in the curriculum tighter control over teaching is exerted by the government through a narrow focus on skills. This is a worrying trend. As Daiute (2000) argues, when children are involved communicating through ICT they will confront 'social and ethical challenges', requiring that they understand and control the contexts, purposes, and processes of written language. Children are therefore involved in critical literacy as they develop towards fluency in written language. Communication technologies make context and knowledge explicit, but, Daiute (*ibid*: 10) argues, children need to be 'socialised to critical literacy, to evaluate their literacy actions and to determine how these actions affect society and support their own development'.

**Five Myths about ICT and education**

Despite the significant role of educational technology within the educational state apparatus, outlined above, very little writing and research about ICT in the UK has been from a critical perspective. This is hardly surprising, as much of the research is

sponsored by the technology industry. For example, the 'Kidsmart' project, one of the first large scale studies of young children using ICT in the UK was sponsored by IBM (Siraj-Blatchford and Siraj- Blatchford, 2001). In both government and other publications the recent focus is on how best to use ICT. The inherent benefit of educational technology for both children and teachers is a given. We have been sold the dream now we have to prove that it works. How and why ICT has impacted on the daily and educational lives of children and teachers and who has really benefited from the educational use of ICT are questions that do not appear to be asked.

In order to start to address these questions and to further a critical understanding of the complex position of ICT within education this paper will now explore five myths about the provision and use of educational technology.

**1. 'Technology is neutral'**

Educational technology is not neutral, just as any technology is not neutral. As Light (2001: 711) has argued, 'Technology is not a neutral tool with universal effects, but rather a medium with consequences that are significantly shaped by the historical, social, and cultural context of its use.' Inherent in the design and architecture of educational technology is the assumption of certain western business, cultural and ideological values. Almost all of the hardware and software used in schools is designed by businesses that are based and owned in USA (and made cheaply in developing world). The global power of these companies has led to the demise of localised and specialist educational technology companies (such as Acorn in the UK). As a result of collusion between the state apparatus and the powerful global IT industry the school has been transformed into a lucrative market. ICT has had a major role and function within the privatisation of education (Hill *et al*., 2002; Rikowski, 2002, etc). Also, much of the hardware and software in use in schools is originally designed for business. This paper is written and published with MS Word - how is the context framed by the software which is designed and made for profit and not for education? Säljö (2000:13) reminds us 'That teaching precedes learning is an image of the human building of knowledge that is created by the school. But it is essential to realise that each everyday practice in the myriad of communicative activities that constitute society in itself contains pedagogy.' The central influence of global commerce on educational technology therefore needs to be acknowledged.

Castells (1999) argues that technology is developed through the process of conflict. The final design of a technology becomes the platform for continuing struggle, in which the design as such supports or suppresses different, essentially political, objectives. Since every technological design has been achieved through conflict, and since each design needs a social environment to function in, a certain technology is never capable of carrying through a specific political agenda on its own. Rather, 'the ideologies crafted in the course of technological innovation are inherently ambiguous and susceptible to multiple interpretations' (ibid: 39). Examples of this inherent conflict are given by Dyer-Witheford (2000: 207). He identifies two distinct groups in the labour process involved in the production of new technology. The highly skilled technical workers who are central to the making of digital technology. Mostly male, white and highly educated these are the 'knowledge workers'. Needed by an industry whose profit depends on constant stream of innovation. They are romanticised and adulated by the media and extremely wealthy. There is also another far less glamorous workforce in 'Silicon Valley'. These are the caretakers, microchip assemblers etc. Largely women they are often from immigrant backgrounds with low pay, no health insurance and maternity benefits. A system of contracting out devolves responsibility of exploitation from very wealthy and prestigious high tech companies.

A further example of the potential for conflict was identified by Revell (2004). In 2004, the UK Government announced funds of £570m to be spent on electronic whiteboards and support systems for teachers over the period from 2004-2006. This was an increase of 11 per cent over previous spending commitments for educational technology. At same time teachers pay was only due to increase by 4 per cent.

## 2. 'Placing technology in schools and classrooms leads to automatic learning gains'

Government rhetoric (NGfL, 1998; NGfL, 2002 and DfES, 2003a) promotes the myth that spending vast sums on educational technology and then placing the technology in schools and classrooms will lead to automatic learning gains. Central to this myth is the emphasis on the 'potential' of ICT in the school and classroom. For example:

> Used well digital technologies have the potential to improve achievement in our schools and colleges, to boost the prospects of British industry and commerce, to offer opportunities to all learners, particularly those who would otherwise be excluded, and to significantly enhance our quality of life. (Tony Blair, 'Open for Learning, Open for Business', DfEE 1998)

> ICT has enormous potential not just for the National Curriculum. It will change the way we learn as well as the way we work. (Yapp, DfEE 1999)

However, as Scrimshaw (1997) stated, nothing miraculous happens just as a result of placing the computer in the classroom – there are no automatic learning gains.

Any 'potential' arises out of the interaction between children and teachers in the context of using ICT – not from the technology itself. Cuban (1993) famously identified a pattern that has emerged from the introduction of machine technology into schools (films, TV, audio-tape, VCR and ICT, over the last century. The cycle starts with big promises backed by the technology developers' research (the emphasis on the 'potential of ICT' discussed above). In the classroom, however, teachers never really embraced the new tools, and no significant academic improvement occurred. This provoked consistent responses: the problem was money, or teacher resistance, or the paralyzing school bureaucracy. Meanwhile, few people questioned the technology advocates' claims. As results continued to lag, the blame was finally laid on the machines. Soon schools were sold on the next generation of technology, and the lucrative cycle started all over again.

Further, Cuban puts forward reasons why new technologies have not changed schools as much as other institutions:

> First, cultural beliefs about what teaching is, how learning occurs, what knowledge is proper in schools, and the student-teacher (not student-machine) relationship dominate popular views of proper schooling. Second, the age-graded school, an organisational invention of the late nineteenth century, has profoundly shaped what teachers do and do not do in classrooms, including the persistent adaptation of innovations to fit the contours of these age graded settings. (Cuban, 1993: 186)

Following Cuban, we need to ask why and how the current digital technology is any different to previous machine technologies and will the impact on education be the same as that identified in Cuban's cycle? My own research with teachers in nursery and infant schools (Waller, 2000 and Waller, 2003), for example, found relatively

little evidence that ICT has influenced a change in the classroom teaching and learning of literacy. The current UK government is so convinced that educational technology impacts directly on children's learning that in 2004 they provided every state nursery school with the latest kit – an electronic whiteboard. Not only did the teachers not ask for the kit, they were also not trained to use it before it was installed in the classroom. At the time there was very little research demonstrating the benefits of electronic whiteboards in education, and currently, despite research such as Miller et al. (2005), there is still limited 'evidence' of successful educational use of whiteboards in early years classes.

Furthermore, Conlon (2005) for example, questions whether the recent introduction of broadband connectivity will lead to changes in pedagogy and is generally pessimistic about the overall potential for ICT to transform learning and teaching. In 2006 even official government organisations such as Becta are acknowledging that 'the opportunities to capitalise on the potential benefits of e-learning have often been delayed' and 'ICT has not yet reached the point where it can be said to have transformed the educational process' (Becta, 2006a: 6). As Cuban (1993) observed, towards the end of the cycle of the introduction of machine technology in education, teachers tend to get blamed for a lack of impact – this is now coming through in official documents. For example, 'a key concern is the extent to which teachers fail to appreciate that learning and teaching through technology requires a new approach to pedagogy, to planning and preparation and to how the curriculum is perceived' (Becta, 2006a: 7). Again, it seems that the government expects the technology itself to be the catalyst for pedagogical change.

### 3. 'Giving teachers access to educational technology makes them more professional and efficient'

In order to justify the considerable recent expenditure on educational technology the UK government is very keen to promote the myth that giving teachers more technology makes them more efficient. They assert that, for teachers, access to ICT contributes to 'improved professional development status, helps to increase capacities and provides opportunities for career development and progression' (DfES 2003a: 13-14). According to the DfES Survey of ICT (2003b), the majority of schools reported that ICT actually reduced teacher workload in terms of preparation, planning and

assessment. However, this information was collected for the first time in 2003 and it was self reported by headteachers. There is no evidence that most teachers feel that ICT reduces their workload, nor makes them more professional and efficient (Becta 2004b).

Conversely, the PricewaterhouseCoopers study of teachers' workload (2001) acknowledged that the number and pace of educational initiatives over recent years had placed additional demands on teachers and the authors identified a significant role for ICT in this development. Also, as Apple (2003: 448) has argued, the reliance on pre-packaged software can cause a loss of skills and dispositions as local curriculum planning and evaluation become obsolete. Through online curriculum materials teachers become 'isolated executioners of someone else's plans'. This not only leads to the deskilling and de-powering of teachers it also results in the intensification of teacher's workload as they are increasingly expected to operate in a digital online network controlled by the DfES and owned by corporate IT business. Teachers' working practice is also intensified through the use of laptop computers at home, working online at home and being contactable through mobile phones at any time. This blurs the boundaries of work and leisure – the life-time/work-time distinction becomes unclear. Thus educational technology enhances the surplus value of teachers. McLaren (1999: 14), argues that 'the logic of privatisation and free trade –wherein social labor is the means and measure of value and surplus social labour lies at the heart of profit-now shapes archetypes of citizenship ... .and creates ideological formations that produce necessary functions for capital in relation to labor.'

It is clear that in the case of teachers and other educationists surplus value is extracted through and in the context of using digital technology at work and at home. Moreover, whilst educational technology increases surplus value it is also site for hegemony, resistance and counter-hegemony. For Curtis (1992: 8), cited in Apple and Whitty (1999: 17), 'No bureaucracy can function unless those subject to it adopt specific attitudes, habits, beliefs and orientations: attitudes to authority, habits of punctuality, regularity, and consistency, about the abstract nature and legitimacy of authority and expertise: orientations to rules and procedures. These attitudes, habits, beliefs, and orientations do not spring into existence out of technical necessity: they are the products of complex and protracted conflicts'.

## 4. Equipping Schools with increased ICT leads to school improvement

Not only is the myth of the 'e-confident' teacher equated to being an excellent teacher perpetuated, but also, successful school improvement now involves becoming an 'e-confident school'. The 'e confident' school, according to the DfES (2003a), develops seamless links between administration and curriculum. It also has higher bandwidth connectivity, increasingly uses wireless networking, the profile shifts to more mobile kit and there is growing use of a managed learning environment (MLE). This assumption has the same flaws inherent in myths one and two. Namely, problems of digital divide. Larger, more 'successful', and therefore wealthier schools have more educational technology and more up-to-date kit and are therefore much more likely to meet the criteria for the 'e-confident school'.

Castells (2001) argues that schools have failed to adopt the type of pedagogical thinking required by the Internet era, thinking that originates in the old idea of learning to learn. What is really required is the skill to decide what to look for, how to retrieve it, how to process it, and how to use it for the specific task that prompted the search for information. 'Resulting from the misery of schools, the task of preparing young people for the new era is left to the homes, a fact that is likely to further add to the disparities in the knowledge, skills and attitudes of children and young people' (*ibid*: 116).

There is evidence that one of the most significant impacts of the educational use of ICT has been that the technology has increasingly been used for control and as a tool for 'efficient management and administration' (source). Cunningham et al. (2004) for example found that networks were valued highly by senior management in developing school systems for administration and easing management tasks.

## 5. 'Students need to have technological literacy in order to be employable'

The fifth and final myth involves the need for students to possess technological literacy in order to become employable. According the Office for National Statistics (2006), 'Society is becoming increasingly dependent on technological knowledge and skills, as is the labour market. Students with little or no exposure to Information Communications Technology (ICT) in schools may face difficulties in making the

transition to the modern labour market.' Leaving aside debates about what technological literacy really is (Topping, 1997), this official government 'advice', interestingly found on a statistics site, is contrary to the evidence that many specialist computer workers are unemployed in the UK. Children currently learning keyboard skills in primary schools will certainly not be using them when they enter the employment market in 6-10 years time. As digital technology is constantly changing to meet the needs of capital it follows that technological literacy is not fixed but constantly developing. As Cuban (1993), asserts changes in the classroom for which business lobbies rarely hold long-term value. Rather, they are often guided by labour-market needs that turn out to be transitory; when the economy shifts, workers are left unprepared for new jobs. As Naughton (2007: 12) notes in article entitled *'Welcome to IT class, children; log on and be bored stiff',* the current curriculum requires:

training in the use of Microsoft software such as Word, Excel and PowerPoint and children go home and log onto Bebo, My Space to update their profiles, run half a dozen simultaneous instant messaging conversations, use Skype to make free phone calls, rip music from CDs they have borrowed from friends, send incomprehensible text messages, view silly videos on YouTube and use BitTorrent to download current episodes of *Lost*. Our schools are providing ICT training whereas what is needed is ICT education. Preparing kids to use the ageing tools of an old paradigm – rather than educating them for life in a networked society.

Clearly, digital technology is not going to be removed from schools – the critical question about educational technology concerns control. As Castells (1999: 40) points out, 'the control over knowledge and information decides who holds power in society'. The same is true for education and schooling. Even some at the forefront of the IT industry recognise that 'What's wrong with education cannot be fixed with technology' (Steven Jobs, co- founder of Apple Computers, 1996). Firstly, there has not been any real debate about the nature of schools, curriculum and pedagogy with ICT. What children really need to be taught in school is not tool skills but process and critical understanding. Children and teachers need to be far more involved in the design and ownership of the technology. Also, as Heppell (heppell.net) has consistently argued, schools need to build on many children's experience of technology at home. A significant part of ICT use outside school is computer games.

According to The Guardian (2005, G2: 4) 'In the UK, among the 10-15 age group 77 per cent of boys and 36 per cent of girls play regularly'. The average time involved is 14.2 hours per week and the industry was estimated to be worth over £200m to the UK balance of trade in 2003.

Whilst acknowledging the challenges posed by Capital for teachers and teacher educators ('the suppression of critical thought, the dumbing down and exclusionary nature of political society and the commodification and marketisation of education'), Hill (2003), argues that opportunities exist for counter-hegemonic struggle and 'whatever space does exist should be exploited. Whatever we can do, we must do'. Through engaging in critical transformative practice (Hill et al., 2002, etc) educators can enable critical reflection and encourage children to be concerned and informed about equality and economic and social justice, in relation to digital technology and all other aspects of the curriculum and life in general.

**Summary and conclusion**

This paper has considered the use of educational technology from a critical Marxist position in order to question the view that there is inherent benefit in the use of educational technology for both children and teachers. In order to start to unravel the collusion between the global IT industry and educational state apparatus five myths about the provision and use of educational technology have been uncovered and discussed. Of particular significance is the expectation that teachers will increasingly use ICT in their teaching and administration along with the focus on 'e-learning' and 'e-confidence'. This has led to an intensification of teachers' workload and a blurring of the work/life divide. In turn the surplus value of teachers has increased. As Marx (1977) has pointed out, the capitalist system of production consists of the appropriation by the capitalist class of ever greater quantities of surplus value.

The paper has argued against technological determinism and technological fetishism and for an acknowledgement of structure and agency (Apple and Whitty, 1999, etc). Multiple digital divides caused and reinforced by global capital's control of new technology have led to exclusion from the Internet. There is a further division in the ownership, access and use of new digital technology, a division which is unsurprisingly based on class, 'race', and gender. However, this is not a call for the

abandonment of educational technology. As Apple and Whitty (1999: 17) point out, relations of dominance and struggles against them are based on daily social and cultural relations and practices. Digital technology is also a site for resistance and educators can learn from global resistance through ICT. Wright (2004), for example, draws on the work of Hay and Hutnyk (1999) and Stoecker (2000) to show how ICT can be understood as a tool that is useful only so long as it facilitates the movement's efforts at social change. The danger would be if the Internet encourages not only an information rich, but also an analysis poor culture. As Hay and Hutnyk (1999) state, 'More education is more important than more information'. Vast quantities of information available online may blind us to the knowledge and wisdom available from face-to-face encounters with those who have experienced and learned from earlier struggles against capital and the state (Wright, 2004).

Cleaver (1997) argues that we need to review and rethink our understanding of the process of communication. He draws our attention to the importance of challenging the meaning and utility of information, as part of a reconsideration of those with and from whom we aim to be informed. He points out that one of the great lessons that the Zapatistas have learned within their communities is the fundamental importance of listening. Of listening, and understanding, before you speak. Do we need to do rethink our understanding of the process and ownership of communication before spending billions of pounds on (soon to be obsolete) kit, putting it into schools and calling it progress?

This paper has started to critically evaluate the complex position of ICT in education. As Apple (2003) has noted, 'ICT is part of the problem and part of the solution in education'. Educators concerned with social justice need to engage in critical transformative practice. There is also a need to develop local solutions through local ownership both in schools and communities. Children and teachers must be involved in designing and owning their own software. There is also a need to teach children to critically reflect on the use of ICT and for teachers and children to independently conduct further research into the appropriate use of ICT in the classroom.

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