Introduction

Digital technology, and particularly information and communications technology, is frequently, but rather obliquely, referred to in contemporary academic comparative education. Most commonly the capacity to enable rapid international communication and networking is invoked as a facilitating factor in the process of globalization, or more generally as a key component in the formation of contemporary societies, be they identified as postmodern, late-modern, post-industrial, knowledge-centred or some variant of these. Very rarely, however, is sustained attention given to the characteristics and uses of these technologies themselves. This is a pity, since lack of critical scrutiny can lead us to accept some questionable assumptions about what digital technologies do and can do in relation to education and society.

It is all too easy to get drawn towards utopian visions which, for instance, view virtual worlds as new frontiers in which material constraints and physical oppression can be cast aside in the creation of new digital democracies, throwing open access and opportunity to disenfranchised and marginalized groups. Likewise, the virtual dystopian complement of this, the potentially unbounded and unregulated moral and cultural corruption of society, is equally easy to envision and elaborate. A comparative perspective, which by definition grounds and contextualizes activity, on the uses of digital technology would caution and protect against the collapse into any single unitary perspective. Comparison as an activity demands difference, diversity and, at its best, dialogue, and as an academic activity requires explanation, understanding and theoretical development. With respect to digital technologies, however, such academic comparative scrutiny is largely absent.

This lack of specific attention to digital technology constitutes a further lost opportunity in the development of comparative education. Cowen (2006) argues that:

the academic field of study called comparative education must always deal with the intellectual problems produced by the concept of context (the local, social embeddedness of educational phenomena) and transfer (the movement of educational ideas, policies and practices from one place to another, normally across a national boundary); and their relation. (Cowen, p. 561)
The academic study of digital technology and education presents copious opportunities to explore the pedagogic, social and cultural dynamics of embedded educational and cultural practices, and offers an ever-expanding constellation of examples of the transfer of technologies and practices from one context to another. Above all else, it offers rich opportunities for the exploration of the effects of re-contextualization, both as these technologies and associated practices move from one context to another and as the technologies themselves act as a conduit for the transfer of knowledge and the bringing together of individuals and groups, and their pedagogic, cultural and social practices. In the light of this, rather than address the local and global impact of digital technology in general terms, in this chapter I will address a number of dimensions, and specific instances, of the educational use of digital technologies in a range of contexts.

In planning and compiling the World Yearbook of Education 2004 (Brown & Davis, 2004), which addressed the theme of digital technology, communities and education, Niki Davis and I focused on the uses of digital technologies by individuals and groups in a variety of contexts, both in their own learning and in the creation of learning communities and networks. As in this chapter, we worked with a broad conception of digital technology, taking this to include both technologies for the production and manipulation of digital artifacts, such as digital video and audio, and digital communication technologies and media, such as the internet and mobile telephony, signifying a convergence of digital production and distribution. We also set out to explore the use of digital technologies in a wide range of contexts, for instance in individual and collective activities, formal and informal educational settings, and economically rich and poor communities. The resulting collection was correspondingly diverse in the perspectives adopted and the substantive focus of the papers, ranging from consideration of the impact of digital technology on pedagogic modes and school curricula through the technological augmentation of everyday cultural practices and economic activities of children and adults to the extension of the locality, networks and community from geographic into virtual space.

In this chapter I will take up some of the key themes explored and consider these in the light of recent developments in practice. In particular, I want to explore the relationship between the practice and its context in relation to the production and reproduction of social relations in and through education, a distinctly sociological concern but not incompatible with Cowen’s framing of academic comparative education. Engaging with digital technologies and their uses challenges our conceptions of what constitutes a context (by, for instance, the facilitation of virtual communities) and, though their capacity to act as a conduit within and between contexts, foregrounds the need to understand the processes and effects of transfer.

**Learning Technologies**

Alexander’s (2001) international comparison of primary education in five countries illustrates the complexity of the relationship between the practices of formal education and the historical and contemporary political, social, cultural and economic conditions of the societies in question. The organization of pedagogic spaces, modes of regulation,
the content of the curriculum, student expectations, the construction of identities, the recognition of achievement and so forth are interrelated, are shaped by a complex of factors from the systemic to the individual level and vary across contexts. Digital technologies present a number of challenges to these practices, but clearly, given the manner in which practice is shaped in different contexts, these challenges take different forms and have diverse consequences.

As Kress (2004) has argued, the manner in which information is presented on the screens of computers and portable digital devices, for instance, challenges existing notions of literacy. As multi-modal forms of presentation and representation become increasingly common, a demand grows for the facility to produce and interpret not only linear written text, but also audio, digital still images, animation, video and so on. The bringing together of these forms of representation into complex non-linear hypertexts further extends what we might consider to be basic communicative competence in the digital age:

The media of the new screens provide, simultaneously, means for the production of text and for its dissemination. Given the facts of social diversity, the disappearance, or attenuation, or absence of central power, and above all the displacement of the state by the market as the telling source of power, there is now no longer a canonical mode of representation. Rather, the characteristics of the audience (now in any case no longer seen as citizens but as consumers), their needs, wishes and their real or attributed desires move into the foreground. Representational mode becomes a matter of design: does this group prefer image or writing? Moving image or still? What ensemble of modes will serve best my rhetorical needs vis-a-vis this audience? (Kress, 2004, p. 38)

The potential impact of digital technologies on schooling is itself multi-dimensional. The incorporation of competences relating to the use of digital technology into the curriculum of the school clearly transforms the content of the curriculum, but more than this, argues Kress, the productive potential of the creation of multi-modal texts demands the radical revision of underlying models of learning from the reproduction of meaning to the individual and collective production of meaning, from a curriculum based on transmission to a curriculum based on design. Furthermore, as Jewitt (2003) has observed, the move away from the acquisition of ‘competences’ to the fostering of creativity and innovation, with the consequent reshaping of the curriculum and of pedagogy, creates a need for transformation of the practices of assessment within the school:

The multimodal reshaping of the construction of curriculum entities and the practices of reading brought forth by the multimodal context of learning, in particular computer mediated learning, have important consequences for literacy and assessment. There is a need to move beyond language in order to understand the complexity of learning and literacy in the multimodal environment of the classroom. Further, in order to assess what it is that is learnt assessment needs to re-focus in order to attend to the full range of modes involved in learning. (Jewitt, 2003, p. 100)
In this way the use of digital technology both within and beyond the school has the potential to provoke transformation in the curriculum, in pedagogy and in assessment by virtue of the increasing importance given to multi-modal communication, and in particular production, in contemporary schooling. Digital technologies can also be incorporated into the school as pedagogic resources, and used in teaching and learning across the curriculum (for instance, in the development of virtual and managed learning environments, the use of digital visual and audio production, the use of the internet to access information and facilitate collaboration). Whilst much of the literature on digital technology and education presents these transformations as necessities (a thinly veiled form of technological determinism), there is marked variation at the level of practice. This is unsurprising because, from studies such as Alexander’s, we already understand that the practices of schooling are diverse and are the product of a complex of influences. Digital technology and its associated practices and potentials, inside and outside formal education, are made sense of, and incorporated into and transformed by, systems of schooling in the context of this diversity and complexity.

Studies of the use of digital technology in specific contexts present a predictably varied picture of the realization of this potential in practice. As part of Module 1 of the Second Information Technology in Education Study (SITES M1), a survey of the use of ICT in primary and secondary schools in 26 countries was carried out (Pelgrum & Anderson, 1999). This revealed substantial variation in the extent to which new technology was used in schools, and highlighted differences in access to new technology and variation in teacher knowledge as key factors in this. Module 2 of the study (SITES M2) followed this up by collecting reports on innovative pedagogical practices (locally defined and identified by national expert panels) from each of the participating countries (Kozma, 2003). In her analysis of the resulting 130 case studies, Law states that there is some evidence of a shift towards “more collaborative, student-directed, enquiry-based and productive modes of learning” (Law, 2004, p. 151). This statement is made, however, on the basis of examples of what could be considered by the expert panels to be best practice and thus not necessarily representative of practice more generally. Grouping these cases into six activity types (ranging from innovative scientific investigation and project work, through media production and online courses, to more conventional task-based learning and expository teaching), Law then explores the role played by the teacher and the pedagogic strategies they use.

The picture that emerges is that whilst there is evidence of substantial innovative practice using new technology, in terms of the kinds of activities set, the role of the teacher and the kinds of pedagogic strategies they use are somewhat more conventional. Law observes that whilst innovative practice is almost equally represented in the case studies from the five regions covered by the study (the Americas, Eastern Europe, Western Europe, Southern Africa and Asia), the distribution of innovative pedagogy varies markedly. From this she suggests that whilst the dissemination and transfer of activity types between regions is relatively well established, the transformation of pedagogic practices or teacher roles is somewhat less common and more difficult in practice. These, it could be suggested, are less prone to change as they are tied to both the professional identities of teachers and local pedagogic cultures. The range of what is pedagogically possible in one region, or country, or school, for
instance, in making the transition from predominantly didactic forms of pedagogy to more facilitative approaches, can be very different from another. The next phase of the SITES study (Plomp, Pelgrum & Law, 2007) includes exploration of the factors within and beyond school that might act to shape pedagogical practice and the use of digital technology in the classroom, and the contextual factors amongst these that might dispose teachers and schools to innovative practice.

In wide-ranging and large-scale multinational studies such as SITES, it is difficult to explore the relationship between digital technology, pedagogic practice and the impact on student attainment in any meaningful way (given the diversity of forms of schooling). Some sense of this relationship can be gathered from more detailed and nuanced studies in specific, more limited contexts. Take, for instance, the evaluation of the use of interactive whiteboards in London schools, carried out by Moss and colleagues (2007). Substantial investment has been made in the provision of interactive whiteboards in schools in economically wealthy countries. These enable teachers to develop teaching materials that incorporate multi-modal resources (including image, sound and movement) and to use these interactively with classes of students. Moss and colleagues set out to ascertain the impact of large-scale investment in this particular pedagogic technology across London, focusing particularly on the process of learning and teaching, student and teacher motivation, student behaviour and attendance, and standards of student attainment in core curriculum subjects. In this study, once again, the manner in which the technology is used in teaching is highly variable, with the most innovative practice being most evident in the practice of those leading in the introduction of the technology.

In assessing the potential of this technology to transform pedagogy, the researchers observe that this depends on what the teachers think it is for. They find that teacher thinking about interactive whiteboards revolves around the potential for greater pace of delivery, increased multi-modality of teaching resources and a more interactive form of class teaching. However, the extent to which pedagogic change can be fostered depends on how deeply the technology is integrated into the pedagogic approach adopted and how the facilities offered by the technology relate to established forms of pedagogy in the classroom and the character of the particular subject area being taught. Put simply, speed of delivery, or the use of a variety of forms of representation, may or may not be beneficial in the learning and teaching of particular aspects of particular subjects. The potential of the technology thus relates to the existing pedagogic practices and to the pedagogic cultures and curricular content of the area being learnt and taught. Whatever the perceived potential and observed practice, the research was unable to find evidence of any relationship between student attainment in the core curriculum subjects and increased use of interactive whiteboards in the year of the study.

The point here is that, again, the form of realization of this digital technology in practice relates to the context in which it is embedded. As the technology moves from place to place, its meaning changes. The technology itself is both re-contextualized and re-contextualizing. Kress and colleagues see digital technology as transforming modes of representation and communication and, through this, demanding a transformation in our models of learning and practices of education. In the practice of formal, and informal, education these technologies and their usage are radically contextualized,
and, as international studies such as the SITES studies and more localized studies, such as Moss and colleagues, demonstrate, factors such as the pedagogic culture of a context (at any level from a system to a specific classroom), the skills and understandings of teachers and the expectations of the students act to shape what is possible and lead to a diversity of practices, which conform and diverge in varying degrees from any imagined ideal. There is more to be understood, though, than the dynamics of the contingency of practice. These practices have social consequences and potentials, and to explore these I want to shift attention from one side of the pedagogic relation to the other and to look at the engagement of learners (though a neat distinction between teachers and learners can sometimes be difficult to sustain over time), with a particular interest in the strategies by which differentiation is achieved. I will also shift attention from the physically defined settings of schools and classrooms to virtual pedagogic, and other, settings.

**Pedagogic Spaces**

Changing modes of communication and representation do not necessarily attenuate the tendency of education to produce and reproduce social and cultural differences in the distribution of attainment and life chances. Gino’s (2006) study of visual communication in an economically deprived urban neighbourhood in Israel, for instance, has explored the manner in which children from three culturally diverse groups living in close proximity draw on their distinct cultural histories in making and interpreting images. These children inhabit the same physical neighbourhood, but in their everyday lives have limited opportunities for interaction with children from the other communities. Visual communication, and in particular the making of images to represent aspects of their experience of living in the neighbourhood, can be seen as offering an opportunity to share experiences and perspectives and the creation of a common space and mode of communication that bypasses linguistic differences. However, the cultural differences between the groups give rise, despite working together to construct and share their work, to very different kinds of image, not only at the level of visual conventions, but also in terms of what can be represented.

The move to the visual here could be seen as reinforcing rather than attenuating cultural difference. This raises interesting questions with respect to the potential of computer-mediated multi-modal representation, both in relation to learning to make sense of a diversity of forms of text (where and how might this take place?) and the potential of intercultural communication (to what extent do online communities, with ready-at-hand shared communicative practices and understandings, reinforce divisions constructed and played out in neighbourhoods such as these). Here we have three communities in a tightly bounded physical space with shared common resources and experiences, but whose networks of identification are defined elsewhere and stretch beyond this setting. Online communication offers different possibilities, by virtue, for instance, of its dominant visual conventions, to each group, and both provides the potential to evade, for better or for worse, interaction with other groups prominent in their physical neighbourhood, and to reinforce existing social, cultural and, ultimately, economic differences.
A study of three secondary schools serving distinctly different communities in post-apartheid South Africa by Dowling and Brown (in press) explores the relationship between the characteristics of a community (including the culture and practices of students and parents, and the positioning of schooling and teachers in relation to this community and its aspirations) and pedagogic practices and relations within the schools (including the layout of classrooms, the use of texts, the modes of interaction between students and teachers, and the teaching and learning strategies of teachers and students). How school students position themselves in relation to their immediate locality and community, and how they envisage their future trajectories in relation to these communities clearly has an impact on their orientations to virtual communities and networks.

The school students at a predominantly white school located in a wealthy suburb, for instance, saw themselves as part of a global network and held aspirations that extended across this network (which was consistent with the aspirations and identifications of the school). In contrast students at a predominantly black African township school identified more strongly with their immediate community, but those that sought to leave this community (including teachers who aspired to pursue other careers) saw individual effort, within a supportive community, in formal education as the means to achieve this (Dowling & Brown, in press). Whilst this study does not concern digital technology directly, it does demonstrate the complex relationship between community and pedagogic practice in a way that might lead us to think carefully about assuming that virtual spaces are socially and culturally neutral, and to consider how they might act as contexts for the production and reproduction of social inequalities as do physical pedagogic spaces and practices.

Doherty (2006) provides an illustration and analysis of the complexity of projecting pedagogic practices and attendant assumptions, from one culture to one or more others, by way of an online distance education programme. This study focuses on an MBA unit offered internationally by an Australian university. In designing this online course, care was taken to respect the cultural identities of the participants, and to treat the diversity of experiences and perspectives of the participants as a pedagogic resource, for instance, in setting up small group discussions around the workplace narratives of the members of these, deliberately formed, culturally diverse groups. This in itself presents a paradox that is difficult to manage. Individual members of the groups become privileged informants on, and thus heavily identified with, sets of culturally marked localized practices. This representation of self through the abstraction and re-description (for an international audience) of workplace experience clearly bears the danger of defining individuals and groups in relation to the dominant culture or cultures of the programme. It can also lie in tension with the aspirations of participants who have made a positive commitment to enrol on an ‘international’ programme as a means of extending or supplementing their cultural identities and gaining access to what they might see as being a potentially valuable international or global discourse.

Other ‘troubles’ identified by Doherty more predictably revolve around sometimes systemic assumptions of cultural homogeneity, like the ethnocentric default naming conventions in the virtual learning environment, the presumption of knowledge of textual conventions in assessed coursework and the effects of time/space displacement on
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 provision of feedback to participants. Though Doherty’s analysis – and related work on international programmes, such as Singh and Doherty (2004) – goes further than this, the main point to be made here is that online courses in virtual settings are as much party to the play of pedagogic, social and cultural identities as any localized, located and demarcated face-to-face educational programme. Indeed, they may provide particularly fruitful contexts for the further development of the ‘sociology of pedagogy’ (Singh & Luke in Bernstein, 1996, p. xiii).

Collis (2006), in a collection of papers exploring “the patterns and dynamics of the network society in its policy dimension” (Castells & Cardoso, 2006, p. xix), considers the transformation of education in corporate, professional and higher education settings in the light of the shift to a knowledge economy. She focuses particularly on the potential of e-learning to support productivity in a situation where, citing a New Zealand Ministry of Economic Development statement on the skills needed to sustain contemporary knowledge economies, ‘know-why and know-who matters more than know-what’ (Collis, 2006, p. 216). Though this clearly echoes a long-standing aspiration of broadly progressive forms of education, Collis observes that much of the practice in e-learning, in which digital technology is used in the management and delivery of education and training, particularly in corporate settings, works in a contrary direction by delivering de-contextualized fragments of knowledge through depersonalized managed learning environments. Collis presents a number of counter-examples in which digital technology, in particular the use of Internet-based resources, online interaction and digital repositories, has and could be used to foster corporate cross-disciplinary knowledge building and sharing, the development of physically remote but mutually supportive professional communities of practice and modes of assessment in higher education that foster reflection, sharing and cumulative knowledge building.

It is notable, however, that once again whilst digital technologies are presented as key drivers of the development of the knowledge economy, the conditions for the appropriate and productive use of digital technology in education are far from in place. The productive use of electronic portfolios in higher education, for instance, is seen as requiring greater institutional investment, flexibility of accreditation bodies, reform of the practices of lecturers and transformation of the expectations of students. As Selwyn (2007) has observed, the gap between the aspirations of advocates of educational technology, like Collis, and the current limited, rigid and constrained usage of digital technology evident in higher education is not easily breached. The use of digital technology in higher education is, Selwyn argues, shaped by a range of forces at various levels within the system, from governmental concern with global economic competitiveness, through the ‘new managerial’ concerns of university administration and the commercial interests of the software, hardware and system providers to the experience, interests and concerns of university students. The development of productive engagement with digital technology in formal higher education from this perspective thus requires macro and micro political engagement if the aspirations of educational technologists are to be realized.

Whilst schools and higher education institutions struggle to incorporate creative and flexible uses of digital technology and establish programmes in which the collaborative co-production of knowledge is ostensibly prioritized over transmission, there are
communities of physically dispersed agents, collectively and productively engaged in the co-construction of knowledge, collaborative activity and the sharing of information and strategies thriving, to varying degrees, on the Internet. Most notable are the flourishing informal communities based around shared interests, such as fans of a particular television programme or computer game, or those with an interest in particular technological, cultural or political activities, or shared identities and practices. These communities do not, however, escape the play of cultural and social capital that marks similar endeavours in the ‘space of places’.

In a study of Internet fan sites, Whiteman (2006) explores the manner in which authority is established and maintained in online interaction. Far from being open to the free play of positions, perspectives, voices and identities, these sites, though highly productive in the exchange of ideas and information and in the production of commentary on their specialized, and related, areas of interest are highly regulated in and through the contributions made by participants. The strategies deployed by participants act to establish a range of possible legitimate identities and positions mark out who can say what in which settings. The strategies can be viewed as pedagogic in that they act to induct participants into particular modes of engagement and interaction in addition to producing and reproducing knowledge about their chosen area of interest. In conducting the research, Whiteman deploys a broadly comparative strategy in that she looks at two distinctly different sites (though how they might be distinguished beyond surface description is as much a product of the analysis as a starting point). One site, City of Angels (COA), is dedicated to the US television series Angel and the other site, Silent Hill Heaven (SHH), concerns the Silent Hill series of videogames.

By analysing postings in a sample of the discussion lists, Whiteman explores how authority and status are established in these fan communities, and the manner in which affinity to particular objects is achieved and regulated. She identifies continuities and discontinuities between the two sites, and is able to explore the different strategies that are deployed by participants in the establishment of an online identity, in claiming authority, in building and regulating a community, and so on. In each case a balance between openness and regulation is achieved in what are ostensibly completely open contexts. Each, however, has its own distinct culture and exhibits the deployment of range of pedagogic strategies through which participants are inducted into appropriate behaviour, and are included, positioned and excluded (Whiteman, 2006). Though not formally constructed as such, these are pedagogic spaces and within these spaces social difference, relations and structures are produced and reproduced.

**Digital Divisions**

Access to digital technology is clearly not uniform within or between contexts. For those who see digital technologies as a key contemporary educational resource, the differential access to these technologies is a central concern in addressing what is commonly seen as the ‘digital divide’, with relative wealth or poverty of access clearly discernible between rich and poor communities, regions and countries. Whilst access to these technologies is clearly an important issue, this chapter has attempted
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to establish that it is not the only issue in understanding, and addressing, social and cultural inequity in, and beyond, education. The struggle to ensure more equitable access to digital technology has to be accompanied by endeavouring to understand how, through different modes of engagement with and through these technologies, inequalities are (re)produced. Not to do so invokes the danger of the fetishizing of technology, and the pursuit of access as a social project in and of itself.

This is evident in the One Laptop per Child (OLPC) project, initiated by Nicholas Negroponte and other faculty of the Massachusetts Institute of Technology Media Lab. The aim here is to develop a low-cost laptop computer that can be widely distributed to children in both the ‘developed’ and ‘developing’ worlds (see http://laptop.org). The laptop and its software have been developed, it is claimed, to exemplify a ‘constructionist’ approach to learning and thus facilitate ‘learning learning’. Though it is claimed that this is an education not a technology project, the development of the laptop, rather than the principles of its use, have been to the fore. This project has not been universally well received. The Government of India, for instance, turned down the offer to participate on the basis that it would divert funds away from more established needs (The Hindu, Tuesday 25th July, 2006). Others have argued that, with even small amounts of money able to make a distinct difference to life chances in desperately poor parts of the world, through, for instance the provision of fresh water and vital medication, this effort is misplaced. Aside from this, the project itself has run into a number of problems relating to the production of the technology to specification and budget and relating to assumptions made about the conditions in which people live, difficulties in meeting the costs of running the machines and the provision and maintenance of basic infrastructure.

The very assumption that the provision of a laptop (or, in this case, a simplified device that bears only limited similarity to a commercial laptop) and selected software (though not, in this case, established business and educational software) will make a substantial contribution to the educational and life prospects of the school students in this vast array of social, economic and cultural circumstances, is itself open to serious question. Even in classrooms in the USA, doubt has been cast by researchers of the value added by giving one-to-one access to laptops. For example, Dunleavy, Dexter and Heinecke (2007), in a study of two middle schools, found that a one-to-one ratio of laptops to students in the classrooms studied did not automatically add value, and suggested that the high cost and the management challenges presented to teachers by the provision of laptops creates a demand for thorough professional development to ensure that teachers are able to create and manage appropriate learning environments.

This does not necessarily mean giving up on digital technology in all but the most economically privileged circumstances (and thus opening the divide further). An alternative strategy is to select and deploy digital technologies in a way that is more carefully attuned to the specific context and circumstances of their use. In the light of the studies cited so far in this chapter, a focus on teacher development would seem to be particularly valuable. Leach and Moon (2002) explore the ways in which digital technologies can be deployed in the education of teachers in wider attempts to reform schooling and to meet national and international objectives, such as universal primary education. They present a number of examples from contexts ranging from poor rural communities in sub-Saharan Africa attempting to rebuild education in the
face of war and disease to urban schools in rich Western countries attempting to pro-
vide for increasingly linguistically, culturally and economically diverse populations.
In all cases, the creation and maintenance of a sufficiently large teaching force with
appropriate knowledge and professional skills are seen as key challenges, which dig-
ital technologies and new approaches to teacher education can help to meet.

The strength of the approach proposed and of the examples given is the contextual
sensitivity and appropriateness of the interventions. In many cases conventional forms
of teacher education are themselves not feasible, given the scale of the enterprise and
the levels of resources available. In these settings, the use of communications tech-
nologies to facilitate teacher learning and networking can enlarge the possibilities for
teacher development far beyond the conventional investment in buildings and other
physical facilities that concentrate resources in one area thus creating distance between
professional development activities and the context of their eventual realization.

The Digital Education Enhancement Project (DEEP) is one such research and
development project which focuses on the use of digital technologies in fostering the
development of the pedagogic knowledge and practice of teachers, and exploring the
impact of technology enhanced strategies on the motivation and achievement of school
students, in 12 schools in the city of Cairo in Egypt and 12 schools in towns and rural
areas of the Eastern Cape Province in South Africa. As part of this, Leach and Moon
(2004) explored the use of handheld computers by teachers in this project, find-
ing that these small, portable, flexible and easy to use devices became easily integrated
into teachers’ daily workflow and had a substantial impact on teacher professionalism,
organization and planning, collaboration and shared learning, the development of new
classroom practices and the self-esteem of teachers. Studies such as this give some
indication of the potential of new technologies in teacher education and development.
It should be clear, though, that the outcomes are not a function of the technology but
of its interaction with contextual factors in the setting within which the technologies
and their related practices are embedded. This means not only that care has to be taken
in assuming that these technologies/practice can be transferred elsewhere to similar
effect, but that the perceived effectiveness of the intervention itself is likely to be tran-
sitory as, for instance, the technology takes on new social and cultural meanings over
time, and as other conditions change.

Conclusion

Digital technologies are viewed as enabling rapid communication across distances.
They enable the production and distribution of information and digital artifacts, in
the form of text, graphics, sound and video. As these artifacts move from one place to
another, whilst their form might remain stable (or might not), their meaning, poten-
tially, transforms as they shift from one system of signification to another, and as they
are read and reread by different agents bringing different meanings and understandings
to their interpretation. This is nothing new, and indeed is the stuff of that strand of aca-
demic comparative education which attempts to understand the relationship between
systems and practices through addressing, for instance, the borrowings, transfers and
translations between one system and another. So practices associated with child-centred
education in England, such as the public display of individual children’s work as a way of celebrating individual achievement and encouraging collective endeavour, come to mean something very different when transferred to the classrooms of rural Indonesia. This re-contextualization constitutes a transformation as practices are plucked from one network of meaning, or culture, and replaced in another.

Viewed in this way, these practices cannot be understood as having a given essential meaning, but rather can only be understood in relation to the context of their realization. The movement of digital artifacts from one context to another can also be understood in the same way. The spaces through and in which they travel are, however, virtual as well as geographical (and the ‘and’ here is of central importance). It is not just the digital texts and artefacts, though, which meet this fate; it is also the digital technologies themselves.

The emphasis in this chapter has been on understanding digital technologies and their educational usage, both formal and informal, in relation to the contexts in which they are embedded. These contexts can themselves be embedded in other contexts. Individual schools, for instance, are embedded in particular groupings (defined, for example, by the ages of the school students, modes of funding, geo-political location and so on) within particular systems of education (defined, for example, in terms of nation or region or trans-national network of interlinked or associated institutions and so on). Each higher level of organization acts to provide a reservoir of meaning potential for its constituent parts, which in turn, through the realization of this higher level as a repertoire of instances, enables us to describe, understand and explain its characteristics. Classrooms thus have to be understood in relation to the systems in which they operate, and in turn act to constitute the system as instances of it. This relationship operates at any level from individual action to trans-global systems.

The formal and informal pedagogic spaces that have been considered in this chapter are clearly not socially neutral. Just like any material setting or community, virtual settings and communities are marked by the play of social and cultural capital, and through this patterns of social relations are produced and reproduced. Whilst the shift from reproduction of knowledge and artifacts to production and dissemination that is facilitated by digital technology can be seen as potentially subverting formal educational institutions, in practice existing patterns of social and cultural relations and their associated practices act against this. The perceived need, for instance, to train teachers and students to use specialized technologies in particular ways is one example. This inverts the notion of transformation of education by new technologies by reading these technologies as requiring new competences, of teachers and students, which must be acquired before they can be used effectively in pedagogic settings. This creates potential deficits and patterns of distribution of competence, and thus inclusion and exclusion and success and failure in the use of technology in particular sanctioned ways.

Increasingly, the technologies themselves are already part of the everyday experiences of students and teachers. These technologies are not, however, equally part of the everyday lives of all students (and so the degree of resonance between the culture, practices and common competences of, for instance, the home and the school will vary), nor are the material and symbolic resources (such as teacher knowledge and expertise) to be able to incorporate them into the curriculum equally available to all
schools. Even if they were, the relationship between the cultures of the children and the cultures of the school would be different. The framing of the ‘digital divide’ as being predominantly about access to appropriate hardware and software fails to address this. The OECD study carried out in 23 countries by Venezky and Davis (2002) noted that schools were clearly aware of the potential inequalities that the use of digital technologies in schooling might cause, but the strategies to overcome this that they cite relate only to helping low-income families to gain access to these technologies. The report notes that few schools had data to enable them to monitor differences relating to gender, income or achievement.

None of these are determining relationships, but involve potential and meaning, and thus, of course, entail facilitation and constraint. Much of the discussion of the relationship between education and digital technology within and between contexts confuses potential with practice and possibility with necessity. Consideration of digital technology from a comparative perspective, which acknowledges the social embeddedness of the phenomena with which it engages and seeks to understand what happens as entities move or are manifest in different contexts, can help us to avoid, or at least mitigate, these confusions and conflations. The disembedding, or rather re-contextualizing, potential of digital technologies also presents a challenge to comparative education in questioning the utility of the boundaries constructed around contexts (for instance, around national systems) and, indeed, constitutes a challenge to the very notion of a boundary as elements from one context are projected into (and read and reread) in others. Methodologically and conceptually, engagement with the uses of digital technology in formal and informal educational settings provides an opportunity for the enlargement and further development of the productivity of a comparative approach, both academic and applied.

References


