World Yearbook of Education 2004

Digital technology, communities and education

Edited by
Andrew Brown and
Niki Davis

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Series editors' introduction

The *World Yearbooks of Education* have dealt with topical educational issues for well over fifty years now. Many of the topics covered in recent volumes would have been familiar to the original editors since many educational issues stay constant – the management of schools and vocational education would be two examples. At first glance, the topic of this *Yearbook* would appear to be novel, for both the speed of development in digital technology and its impact on education almost appear to have suddenly sprung upon us. But this is not really the case. Like vocational education and the management of schools, the impact of new technologies on education has also been a recurring topic. The 1982 *World Yearbook: Computers and Education* and the 1988 *World Yearbook: Education for the New Technologies* demonstrate a continuing concern for the way in which education faces up to the rapid development of new technologies. This volume continues this process. What is new is that digital technologies are really beginning to make dramatic changes to education in ways that were only glimpsed at in those earlier volumes.

As this current volume makes clear, a real revolution in the way in which we conceptualize and practise education and learning is taking place. Revolution is not too strong a word as both the pace of change and its impact on education are truly remarkable. This volume goes further than merely describing this rapidly changing educational context, seeing digital technologies as emancipatory for teachers, learners and the communities to which they belong, including new virtual communities, while at the same time warning of the dangers of a 'digital divide' both within states and between them. The volume is appropriate to the *Yearbook* series not only because its contributions cover a wide range of states, but also because the authors recognize that digital technology and its impact on education are major aspects of the wider process of globalization. Several chapters are indeed forerunners of next year's volume on globalization.

It is no longer a specialist field, although the contributors are all specialists. Anyone with an interest in the current rapid changes in

education must take on board the issues raised by this book. Consequently, we are grateful to Andrew Brown and Niki Davis for collecting together such a wide-ranging set of perspectives, ground-breaking case studies and radical analyses.

David Coulby and Crispin Jones
Bath, 2003

Introduction

Andrew Brown and Niki Davis

Writing on the educational and social potential of new technologies is interspersed with imagined cyber-utopias and cyber-dystopias. Commentators have been preoccupied with, on the one hand, the emancipatory potential of technology to empower individuals and groups and, on the other, the potential of technology for surveillance, oppression and constraint. Similarly, in relation to cognitive development, new forms of technology are frequently presented as either enabling (providing additional tools and contexts in which learners can develop new skills and understandings) or limiting (engaging users in routine tasks and procedures that dull creativity and impede problem solving activity). In the meantime, practitioners and researchers across the world, in a variety of institutional settings and social, cultural and economic conditions, are using new technologies in anticipated and unanticipated ways, with both anticipated and unanticipated consequences.

This *World Yearbook* sets out to explore the manner in which digital technology is used by individuals and groups in both their own learning and in the development of communities of practice which act as contexts for learning and interaction. In doing this, the editors and authors recognize that we are dealing with a diverse set of technologies and a wide range of communities. The technologies in question range from communication media such as email and the Internet through to production media such as digital video. These media are, however, converging and the separation between communication and production, between distribution and content, becomes ever less tenable. At the same time the division between formal and informal educational settings and between leisure activities and learning has also been eroded. It is for these reasons that we have chosen to focus on 'digital technology' rather than 'information and communication technology' (ICT), the term used predominantly in the UK, or 'technology', the preferred term in the US. 'Digital technology' as a term is sufficiently broad and free of limiting connotations and is internationally recognizable.

The notion of community is key to the chapters in this *Yearbook*. Digital technologies have provided a means for the creation of new virtual

communities, for instance around particular social or cultural interests, and for the reproduction, reassertion or reinvention of identity of spatially displaced communities, such as refugee groups. It has also enabled groups and individuals to interact with each other through new media and highlighted the need to address issues of intercultural communication and understanding.

As well as considering different forms of digital media and their use in different social, cultural and economic conditions, the chapters cover a range of different forms of community, forms of cultural identity, and forms of communication, understanding and relations between different cultural groups as they are facilitated and mediated by the use of digital technologies. These issues are variously addressed by authors both with respect to relations within and between their own 'local' communities and wider international and intercultural relations in the global arena. In the process of doing this, the issue of 'digital equity' and the differential access to digital technologies and skills is brought to the fore.

The apparent lack of boundaries when using digital technologies leads to the reconsideration of the relationship between what have conventionally been considered formal and informal modes of education. Online learning and teaching, the emergence of new 'communities of practice' beyond the school and college and the active engagement of particular cultural and interest groups, including parents, have generated a range of new sites for pedagogy and learning. This collection explores the effects of this diversification of pedagogic sites on how we think about learning and teaching, on educational institutions, on the preparation of teachers, on the development of new educational media and on strategies for development and change. In reflecting on these effects, the authors adopt a range of approaches and a variety of perspectives. Descriptions are given of initiatives designed to increase access to and participation in education, an outcome urgently pursued by international agencies, including the United Nations Educational, Scientific and Cultural Organization (UNESCO), which also strive to work in ways that respect local cultures and diversity (Haddad and Draxler, 2002).

Yearbook structure

This *World Yearbook of Education* is unusual. The structure and content of the book reflect Castells' (1996) suggestion that, with the advent of the 'network society', it is necessary to rethink spatial distinctions to recognize the importance of both the virtual 'space of flows', created through the interlinking of digital information and communications systems in distant locations, and the physically bounded 'space of places', locales which provide the setting for much of the day-to-day experience of social agents. The approach we have taken in compiling the collection also

recognizes the creation, within the network society, of a 'Fourth World' of exclusion that crosses national boundaries and other established distinctions such as First/Third World and 'developed'/ 'developing' economy. This reinforces our concern for 'digital equity' and the consequences of the 'digital divide'.

We have not attempted to provide an overview of the use of digital technologies in education in the world today by presenting an array of distinct national, regional or other geopolitically defined perspectives. Instead the authors, drawn from twelve countries and five continents, reflect on the ways in which digital technologies serve to link cultures and disciplines within and across locales to build or reinforce communities in the enhancement of learning and teaching and in the production and reproduction of knowledge. To achieve this, we have attempted to combine analysis with the presentation of empirical research and description of specific experiences, projects and initiatives. The chapters also move from consideration of general issues across contexts to the specific concerns of particular groups, the perspectives of children to the professional development of teachers and relations within communities and interactions between culturally diverse groups. In this way we strive to get a sense of how people are thinking about the relationship between digital technology, communities and education and what groups and individuals are doing with these technologies within conditions of complexity, diversity and flux.

The chapters in the collection are organized as four interrelated sections. The first, *digital transformations*, deals with the impact of digital technology on educational thinking and practice in formal and informal settings. The second section moves on to consider the central social agents of education, *learners and teachers*. In the third section the focus is on the *intercultural interactions* that are facilitated by the use of digital technology. The final section presents a number of examples of the use of digital technology in *building communities*, concluding with a paper on the restructuring of education in Chile, which provides an example of how carefully planned collaborative support with digital technology can foster change in complex settings subject to changes in local, regional, national and global political climate.

Digital transformations

Digital technology is both a key element in the production of late modernity and a product of it. It both shapes and is shaped by contemporary circumstances. In relation to education, digital technology fuels change in and an increased demand for formal education, whilst motivating fundamental questions about what constitutes learning, where and how learning takes place, and the effects of interaction using digital technology on the reproduction of social and cultural relations.

However, whilst 'ICTs have revolutionized the world economy', education, it appears, remains relatively unchanged (Haddad and Draxler, 2002: 6).

In the first chapter, *Gunther Kress* adopts a semiotic view of learning in the context of digital technologies and develops a theoretical perspective that has the potential to address current demands for education to 'produce' 'young people who have dispositions towards creativity, innovation and ease with change'. He notes that the rearrangement that has taken place 'in the constellation of modes of representation and media of dissemination – from writing and book to image and screen – is having profound consequences for meaning-making and hence for learning'. Currently dominant learning theories were developed in a more static era when a society's rules and officially sanctioned knowledge could more easily be identified and critiqued. The social semiotic approach to meaning taken by Kress asserts the inseparability of the sign from the sign-maker's motivation. He explores the implications of this by using a number of examples. Learning, from this perspective, is about the making of meaning and, in the light of this, it is necessary to rethink educational processes. New media have fundamentally changed relations between author and reader and offer new possibilities for multimodal production. Authority relations with respect to knowledge production have subsequently, Kress argues, been inverted and groups and individuals can now take responsibility to gain and create the knowledge they require. As a consequence Kress urges us to view education in the age of digital technology as design rather than transmission. This requires us to provide support for learners to ask: 'How can I implement my desires, given these historically shaped resources, the structure of power in this environment, these characteristics of my audience?'

The concerns of other authors in this and other subsequent sections of the book frequently address and overlap with the issues raised by Kress. *Bernard Cornu* also argues that there is a need to view education in a fundamentally different way in the light of digital technology. In particular he presents an innovative view of the potential role of education in facilitating the development of 'collective intelligence'. Cornu traces successive conceptions of learning and intelligence, from the view that learning is individual to an understanding of learning as collaborative and subsequently to a contemporary view of learning as networked and intelligence as collective. He states: 'Collective intelligence is a third step, more complex, made of networks of intelligences and which includes a collective dimension in the knowledge, in the problems to be solved and in the way intelligence is activated.' He urges educators to explore this new concept and develop the necessary tools to enable learners and teachers to work collectively in our networked society. He suggests that our conception of a teacher needs to develop

beyond the now established transition from 'sage on the stage to guide on the side' to a collective mode of operation that facilitates collaboration with learners in the achievement of collective intelligence.

The increasing incidence of 'multimedial' texts in formal educational and everyday settings raises questions about how we understand the relationship between different modes of communication and how, in the light of these understandings, we approach instructional design. *José L. Rodríguez Illera* demonstrates the difficulty of identifying a coherent unified descriptive language from current research on multimodal communication. He argues that, in pedagogic terms, the 'multimediality' of programmes, materials or environments has no necessary positive value in its own right. Furthermore, the move to the Internet as the dominant mode for the delivery of educational multimedia has imposed limits on the richness and interactivity of programmes. In order to construct pedagogically effective multimedia environments we need, he argues, to understand the specificity of different modes and how they work together, and to integrate this understanding into a broader theory of learning. Adding additional modes or media to pedagogic texts achieves nothing in itself, and, indeed, can be detrimental to learning, he argues. Whilst digital technology opens up new possibilities for pedagogic design, it is our understanding of pedagogy and learning that must guide this design, not the fetishization of multimediality.

Children's understandings of ICT are central to the realization of the potential of digital technology in education. *Bridget Somekh*, drawing on a comprehensive national study of the impact of ICT on education in the UK (BECTA, 2003), provides evidence of the complexity of children's concepts and of the transformation that has taken place in the domestic world and out of school activities of children. Whilst this research in notable for being the first large-scale study to show a statistically significant positive impact of ICT on learning, it is striking that the informational and communicative connectedness evident in children's out of school activity cannot be matched by their use of digital technology in school. This prompts another call, from another direction, for the transformation of schooling in the light of the impact of digital technology. It also reminds us again of the need to be aware of variation in access to digital technology and the importance of actively attending to 'digital equity'.

In a paper written collaboratively using hypertext-authoring software, *Soh-young Chung, Paul Dowling* and *Natasha Whiteman* examine the transformative potential of community and individual activities in cyberspace for the institutions of formal education. Literature and literacy are conventionally 'possessed' by formal education: Chung, Dowling and Whiteman explore the ways in which this is challenged by the increased visibility, facilitated by the Internet, of the popular production and consumption of literacy in the areas of both popular

and conventionally elite culture. The spaces and communities created, recreated and transformed by the increasing accessibility of new media are not socially neutral, however. As in all areas of social practice there are principles of exclusion and inclusion, and the potential for territorialization and struggle over possession, whilst offering the possibility of new alliances and topographical reconfiguration.

The future of literature and literacy in the light of increasing accessibility of digital technology is also a central concern for *Ronald Soetaert, Andre Mottart* and *Bart Bonamie*. Their particular focus is the exploration of the successive paradigms that have informed the practices of language teaching and that provide conceptual frameworks for understanding the positioning and identity of the members of a particular professional community, language teachers. They reject the quest for a single paradigm and propose a critical rhetorical approach to all modes of communication, not only spoken and written language, but also visual, audio and gestural modes, which recognizes the 'inherent rhetoricity' of electronic and other forms of discourse. They look to the transformation of the relationship between the arts brought about by digital technology, and in particular, as Chung, Dowling and Whiteman have indicated, the potential erosion of difference between the visual arts and literature as writing, to signal ways in which language teachers might 'rethink and retool' in the face of the pervasiveness and potential of 'digitization' in formal education and popular culture.

Learners and teachers

In shifting attention specifically to learners and teachers, the central themes of the previous section are extended and contextualized. In relation to the transformation of education through the use of digital technology, *Toni Downes* states categorically that 'if there is any potential for digital technologies to be used in homes and schools to transform children's lives, it will require a significant and fundamental shift in how we conceive of childhood, learning and schooling' and that until this has been achieved 'it is hard to see how the complex learning that is afforded by digital technologies in the home can also be a reality in schools, and the new learning that children bring from home can find recognition and authenticity in school'. To explore this disjunction between home and school uses of digital technology, she draws on national demographic data from Australia and the US and from a major Australian study of children's use of computers in homes and later UK research. She stresses that children should not be seen as 'workers' in their use of digital technology, but as involved in playful and purposeful activity in which they exercise control over technology and learning. This contrasts with the oft-mundane uses of digital technology in schools, with tight control over time, pacing and forms of activity. As Chung, Dowling

and Whiteman observe, school seems set to become 'an increasingly dour place to be'. Downes draws attention to the variation in levels of access between nations and between social and cultural groups, and points out that the effects of low levels of domestic access to digital technology are frequently compounded by poor facilities in neighbourhood schools. As Castells has emphasized, with the increasing internal diversification of the Third World and the generation of social exclusion within the boundaries of First World nations, the network society has led to the

> emergence of a Fourth World of exclusion, made up not only of most of Africa, and rural Asia, and of Latin American shanties, but also of the South Bronx, La Courneuve, Kamagasaki, or Tower Hamlets of this world. A fourth world that ... is predominantly populated by women and children.
>
> (Castells, 1997: 7)

Harvey Mellar and *Maria Kambouri* present research into the use of digital technology to address the social exclusion of adult individuals and groups who are lacking the basic skills, principally numeracy and literacy, that are seen as essential for employment and participatory citizenship. Their research covers a range of settings and communities, including prisons and refugee groups, and a variety of initiatives, including 'learning shops' and the use of computer games in adult learning designed to reach groups who are alienated from formal education. They observe that the use of digital technologies in these settings is leading to changes in what constitutes 'basic skills', which now includes skills relating to ICT use, and in the occupational and work aspirations of individuals. As in the earlier chapters, the potential of particular forms of provision to exclude as well as include is demonstrated. For instance, the use of computer games to enhance literacy and numeracy can draw in particular groups whilst alienating others. They also identify the experience and approach of tutors as being central to the success of initiatives. The persistence of 'old pedagogies' can lead to the reproduction of the digital divide as a learning divide.

The transformation of pedagogy is the focus of the research presented and discussed by *Nancy Law*. She provides an overview of a 28-country international study of innovative pedagogical practices using ICT, conducted to explore the impact that governmental investment in ICT in education is having on teachers and teaching. The case studies presented illustrate ways in which teachers are incorporating ICT and digital technologies into their practice. The findings also indicate that teachers as professionals have become more connected, working collaboratively with colleagues and members of the broader community to bring about more challenging and more fruitful learning experiences for their students. It is also clear, however, that whilst there is evidence of

changing practice, the transformation of underlying pedagogy, essential, Law argues, to achieve sustained change in education, is somewhat more problematic. The transfer of 'emerging practices' from one setting to another achieves little without the creation and adoption of 'emerging pedagogies'.

The use of digital technology in teacher education to facilitate the development of effective pedagogy is at the heart of the work presented by *Richard E. Ferdig, Laura R. Roehler, Erica C. Boling, Suzanne Knezek, P. David Pearson* and *Aman Yadav.* They describe the use of multimedia case studies of the teaching of reading, which include online videos of practice in US classrooms presented within a searchable database and linked with an online asynchronous conferencing facility. Hypermedia programs like Reading Classroom Explorer use the potential of digital technology to provide teachers with opportunities to experience, explore and discuss good practice in an environment that brings together theory and practice, and for trainee and novice teachers they act to link course-work and field experience. The chapter explores the potential of digital tools and resources like these to supplement, interact with and transform established pedagogic approaches and enable the development of communities of reflexive and reflective practitioners.

Intercultural interactions

The digital transformations discussed in the first section of the book, together with the changing experiences, practices and perspectives of learners and teachers considered in the second section, lay the foundation for the discussion of research and development on intercultural interaction presented in the third section. Digital technology provides tools for individuals and communities to (re)present themselves and for intercultural interaction in virtual spaces. The increasing accessibility of these spaces, and the facility to author and interact within them, raises new questions about the relationship between cultures and individual and collective identities, and the need for greater 'intercultural competence' in digital environments.

Paul Resta, Mark Christal and *Loriene Roy* explore the ways in which Native people in the United States are re-developing their culture, heritage and education, and the manner in which they have adopted and adapted Western technology. They seek to overcome the tendency for digital technology to become an expression of cultural imperialism and develop its potential to improve the lives of indigenous people in a way that is congruent with the indigenous worldview. Their suggestion that other indigenous cultures and nations should explore the development of appropriate protocols and strategies clearly relates to discussion elsewhere in the collection of the relationship between digital technology and education within and between diverse communities and

cultures. Their powerful argument clearly generalizes to other contexts and communities.

The notion that communication technologies can support the learning of, and give voice to the experience of, displaced and potentially excluded people is clearly appealing. The experience of using digital technology with refugee children across Europe presented by *Liesbeth de Block* and *Julian Sefton-Green* leads us, however, to be less sanguine and pay greater attention to complex local social contexts in and through which children establish their identities. They stress that, while there is potential to use communication technologies to connect diaspora over time, displaced children's day-to-day priorities relate to the demands of their immediate social environment. The chapter thus emphasizes the more general point that effective application of digital technologies is always challenging because they need to be embedded within diverse local contexts. In addition, we need to be clear that our aspirations as adults, and the aspirations of policy makers, frequently do not match the priorities and circumstances of children. For the children in this project, the virtual contacts appeared to have greatest potential when they related to current shared popular culture rather than past experiences.

From a corporate perspective, *Michelle Selinger* considers what constitutes culturally appropriate pedagogy. Currently an education consultant for Cisco Systems, an international corporation specializing in Internet networking technology, Selinger draws on her experience as a teacher educator and distance education specialist to survey the Cisco Academies. These were established by Cisco Systems to educate people in over 150 countries worldwide in the use of networking technologies. She argues that the translation of global e-learning into local cultural terms and the use of appropriate pedagogies by local instructors is crucial in making training effective. On the basis of this, she recommends the further development of communication technologies to engage instructors more fully, as a community of learners themselves, in the improvement of the quality of pedagogy and resources to address the diversity of cultures and languages worldwide. The commercial corporate context addressed by this chapter is important because companies are diversifying opportunities in education and, as Haddad and Draxler (2002) note, there is an increasingly urgent need to respond to increasing demands for education worldwide.

Marsha A. Gartland, Scott R. Imig, Robert F. McNergney and *Marla L. Muntner*, like Ferdig and colleagues in the previous section, have created resources to put digital technologies to work. They, too, use case studies and have developed a 'case method' for intercultural education in the digital age. Simulations are known to be effective uses of digital technologies in education and this chapter extends simulation to intercultural teacher education. The chapter provides more than a description of a

multimedia project: it also explains the pedagogical approach in some depth and helps us appreciate the ingredients of a good case that incorporates engagement with intercultural issues.

The project to create a transatlantic community for doctoral students conducting research on ICT and education, discussed by *Andrew Brown* and *Niki Davis*, provides a transition between consideration of the challenges of intercultural communication and the development strategies for community building through digital technology, addressed in the final section. It was in building this transatlantic community, motivated by the same factors that stimulate the study of intercultural communication including an imperative of peace (Martin and Nakayma, 2000), that Davis came to realize that the idea of culture shock, normally associated with physically living within an unfamiliar 'foreign' community, has much to offer our understanding of intercultural interaction in online communities. Their project aims to develop the intercultural competence of the next generation of leaders in educational digital technologies, both through opportunities to travel to become physically part of an unfamiliar research community in other countries and through Web based learning with doctoral students from other settings and cultures. In this way it is intended that students and their university tutors can come to know themselves and others professionally and personally from multiple perspectives.

Building communities

The chapters in this section provide specific instances and realizations of the themes introduced and explored in preceding sections. The purpose is to provide insight into particular examples of the use of digital technology in building communities.

Elsebeth K. Sorensen and *Eugene S. Takle* have developed a complementary transatlantic partnership between their courses, such that Sorensen's Danish students, who are specialists in the use of digital technologies, advise and critically reflect on the ongoing development of Takle's digitally enhanced meteorology course on global change. The collaboration over the years has permitted them to compare their academic cultures, which vary in both in terms of location and discipline. They also bring together intercultural challenges and the building of communities. As with other projects, there is an important social semiotic dimension to their analysis.

Thérèse Laferrière, Alain Breuleux and *Gaalen Erickson* have been working across universities and schools to build large telecollaborative communities of practice in education within and beyond regions of Canada. They describe a synergy, and possibly another instance of collective intelligence, between the groups of actors that include teacher educators, student teachers and school pupils.

Chapter 18 by *Márta Turcsányi-Szabó* on the use of tele-houses in rural Hungary to support education, demonstrates how careful theory-based planning can increase capacity. This chapter provides further examples of activities designed to bridge the digital divide and bring resources into regions challenged by their geography and place in society. Turcsányi-Szabó brings a systemic view to planning and strategic development in the use of digital technologies to raise the profile of marginalized and disenfranchized communities. Her quote from a participant is particularly revealing in relation to the two-way communication that digital technologies allow: 'It is not only our eyes that have been opened, but that of the world too, to see us.'

Christina Preston and *Laura Lengel* have also been supporting development in the 'New Europe' that includes Hungary. Their chapter describes the way in which two communities of professionals who lead ICT in education can enhance the work of each other using communication technologies by building communities of practice between the old and the new Europe.

The final chapter of this *World Yearbook* presents a complex and systemic approach to the renewal education in Chile facilitated by ICT. *Pedro Hepp, J. Enrique Hinostroza* and *Ernesto Laval* present an overview of the Enlaces (which translates into English as 'Links') project, which has been held up as a model by several world agencies including UNESCO and the World Bank, and won the Society for Information Technology in Teacher Education 2003 award for Digital Equity in Technology in Teacher Education. The project is noted for the quality of its systematic planning, which recognizes the need for shared leadership and local interpretation of the teacher education and school support components of the initiative. It is also a story that starts with indigenous people and ends with a visionary aim to connect with 100 per cent of the school population in Chile, including the most remote school in Antarctica. This systemic approach to educational renewal catalysed with new technologies provides us with many clues for the integration of digital technologies in the service of education worldwide and the development of our collective intelligence in this area.

Digital technology, communities and education in 2004

The 2004 *Yearbook of Education* presents a range of perspectives, from key researchers and practitioners in the field, on the use of digital technologies in formal and informal educational settings in and across diverse cultures and communities. In doing so, a number of common themes, outlined in the preceding discussion, have emerged. Authors have repeatedly emphasized that technology must be situated in existing social, cultural, political and economic conditions and systems. They have also stressed the importance of the recognition of complexity (Davis, 2002) and

the need for respect for diversity. Digital technology is seen as offering, but not determining, a range of possibilities for the development of learning and teaching and in the creation and enhancement of communities, including communities of learners and teachers. Our intention has been to present a culturally nuanced and informed account of current thinking and practice in an area that is in the throes of rapid change and development, and in doing so make a timely contribution to international debate and literature in the field.

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