

Edited by Helen Beetham
and Rhona Sharpe

Second
Edition

ROUTLEDGE

Rethinking Pedagogy

for a Digital Age



designing for 21st century
learning

Rethinking Pedagogy for a Digital Age

Through a critical discussion of the issues surrounding the design, sharing and reuse of learning activities, the second edition of *Rethinking Pedagogy for a Digital Age* examines a wide range of perspectives on effectively designing and delivering learning activities to ensure that future development is pedagogically sound, learner-focused, and accessible. This powerful book:

- examines the reality of design in practice
- analyses design within complex systems
- discusses the influence of open resources on design
- includes design principles for mobile learning
- explores practitioner development in course teams
- presents scenarios for design for learning in an uncertain future

Illustrated by case studies from across disciplines and supported by a helpful appendix of tools and resources for researchers, practitioners and teachers, the second edition of *Rethinking Pedagogy for a Digital Age* is an essential guide to designing for 21st Century learning.

Helen Beetham is an independent e-learning researcher and writer, and has worked as a consultant in the UK Higher Education sector since 2001.

Rhona Sharpe is Head of the Oxford Centre for Staff and Learning Development at Oxford Brookes University, UK and a Higher Education Academy National Teaching Fellow.

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Rethinking Pedagogy for a Digital Age

Designing for 21st Century Learning

Second Edition

Edited by Helen Beetham and
Rhona Sharpe

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Foreword to the Second Edition

Do we need to rethink pedagogy again? Does technology innovation imply the continual renewal of what we mean by pedagogy?

There is some continuity of thinking within education. No one has yet shown that we need to change our understanding of how students learn. There have been some wild statements from opinion-formers about technology revolutionizing how students will learn in the 21st century, but the research-based fundamentals of what it takes to learn have not been challenged. The theoretical concepts and approaches still call on Dewey, Vygotsky, Bruner, Papert, Lave and Wenger, with no challenge to our fundamental understanding of what it takes to learn in formal education. Pedagogy is still seen as guiding the learner to learn. The emphasis is still on pedagogy leading the use of technology, rather than adapting to what technology offers.

However, pedagogy has a close relationship with the technologies of learning, and inevitably the scope and style of pedagogy change as the technology changes. The multiplicity of learning technologies, beyond the classroom and away from the teacher, opens up new territories for education. Digital technologies trigger a different kind of relationship between the teacher, the learners, and what is being learned. Yes, we do need to keep rethinking the style and scope of pedagogy as the digital age continues to throw up new technology-driven challenges.

The focus has shifted in recent years from the individual teacher designing a module or session to include teams designing whole courses. There is a greater sense that, with learner access to the burgeoning resources on the web, and with their increasing digital skills, we should remodel education so that learners can take control of their own learning. Certainly, the research literature and the national 'e-learning' policies and strategies of the past few years are full of the promise of the 'self-directed' and 'independent' learning that now become possible. The past few decades of educational thinking have maintained an unchallenged drive to more active forms of student learning – collaborative, experiential, inquiry-based, problem-based approaches citing theories of constructionism, social constructivism and situated learning. The initial manifestation of the web allowed little more than the acquisition learning that was familiar from books and lectures, and did little to address the active learning

sought by educators. With the development of opportunities for user-generated input to digital repositories, crowd-sourcing and social media, the web has at last begun to enable these active forms of learning.

At the same time, the Open Educational Resources movement has turned the web into a universal educational library of lecture materials and well-produced educational resources, available to all. This is a significant shift for education because it provides access to educational materials to anyone who has Internet access. It is a wonderful democratization of access to resources. But it is not the same as access to education. And learning technologists have to keep alive the vision for what technology-enhanced learning could be.

We have to contribute to the policy debates about learning technologies, because opinion-formers outside the field easily overplay the capabilities of technology. At the time of the first edition, learning technologists were insisting that there was more to online learning than lectures on the web, and we should be looking to the active forms of learning that could be offered. Since then, we have had the explosion of social media to connect learners to each other, there are more opportunities for user-generated content, and yet now there are even more lectures on the web. The wider expectation is therefore that ‘self-directed’ and ‘independent’ learning have indeed become possible but online access to opportunities for inquiry, discussion, production, collaboration and acquisition is not itself education. It does enable informal, self-directed, independent learning activities, just as public libraries and public houses have always done – which is wonderful, but it is not education.

This is what the contributors to this book help to clarify. Our digital native students may be able to use technologies, but that does not mean they can learn from them. Being able to read and write never meant you could therefore learn from books. Learners need teachers. As learners we cannot know what it is possible to know, or how to make that journey to what we want to become. We need guidance. Pedagogy is about guiding learning, rather than leaving you to finding your own way. Pedagogy puts the onus on teacher to guide the learner’s journey to a particular and productive end. We may prefer to find our own way. Good. There have always been libraries and friends and experiences to enable us to do that, now supplemented with digital resources and Internet friends and virtual experiences. Informal learning continues with ever better opportunities. Education does something different from what we can do for ourselves. As learners going to education we have higher ambitions – for this we need teachers because that learning journey is as hard as it ever was.

This is why, throughout these chapters, there are references to the centrality of the role of the teacher, and to the complexity of designing for learning. The complex architecture of activities learners engage in as they tackle new ideas and high-level skills shows the difficulty of the teaching task. The field is beginning to recognize that teachers need to help each other discover how best to organize the mix of learning technologies in support of learning.

Equally important is the role of students in helping teachers discover how best to develop the new pedagogies. The exploration of a greater equality of control over the design of learning could be a significant shift for pedagogy. It is a powerful idea that the teacher can learn about teaching from their exchanges with students. Technology gives teachers much better access to how students discuss and debate in an online forum, to data analytics that describe how they progress through a sequence of learning activities, what they produce in a collaborative wiki, how they reflect on their learning journey in their e-portfolio. If, as teachers, we use technology to elicit and make use of this extensive information to remodel our teaching that will be a new task to fit into the teacher's repertoire. It is an exciting prospect, but requires a major rethink of how to manage teacher time to optimize pedagogy.

There is another important source of information about teaching: students themselves. The design for learning field is exploring new ways of representing pedagogy, so that teachers can articulate and exchange their designs. These new forms of digital representation, available in design pattern libraries on the web, can also be available to students, to annotate. It is a much richer and better-targeted form of evaluation than the termly questionnaire, or the feedback sheet. It also raises the prospect of another kind of information explosion for the teacher to handle. Again, this is part of rethinking pedagogy in the face of technology opportunity.

Innovation in digital technology will continue, with teachers being warned that they will revolutionize education, as they have been told repeatedly over the past few decades. Clearly it does not happen easily. There are many actors taking responsibility for what happens in the education community, from ministers to agencies to institutions to employers to families, and in the midst of it all are the teacher and learner trying to accomplish a difficult journey. Digital technologies have many different roles to play in helping us achieve our ambitions for education. One fundamental question is how best to use them to support the teacher and learner in their journey. We will continually be rethinking pedagogy as we explore the answers.

*Diana Laurillard, London Knowledge Lab,
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Foreword to the First Edition

Education is in an interesting transitional phase between its ‘ICT-free’ past and its ‘ICT-aware’ future. That it is in such a transition is a fairly safe claim. Over the centuries prior to digital technology, education evolved into a system that used paper technology in a variety of highly sophisticated ways to fulfil its mission to develop and accredit knowledge and skills. Its future must certainly be one in which it extends this capacity to a sophisticated use of digital technology. Like every modern enterprise, education is currently learning and adapting to the opportunities afforded by information and communication technologies, albeit slowly. Learning technologists make it their business to accelerate the process because the learning cycles of the education system are long, while those of its immediate environment – youth culture, employment demands, scientific knowledge – are short, and changing ever more rapidly.

Leaders in the education system know that it derives its support from the communities that recognize its value, but have been slow to realize that this increasingly depends on how well it exploits the transformational potential of digital technology. All our educational ambitions for the post-compulsory sector are challenging: personalized learning, higher attainment standards, wider participation and improved retention in further and higher education, closer relationships between education and the workplace, lifelong learning, a more highly skilled workforce for our knowledge economy. We do not lack ambition. Achieving these ambitions, or even significant progress towards them, would have enormous value for the communities served by education. Every one of them requires the improved quality and economies of scale that proper use of technology will confer. Yet so many of our institutional and organizational strategies for education consign digital technology to the merely incremental tasks involved in improving our current systems supporting education, not to the transformational task of changing them.

What are we doing? In teaching and learning currently, we tend to use technology to support traditional modes of teaching – improving the quality of lecture presentations using interactive whiteboards, making lecture notes readable in PowerPoint and available online, extending the library by providing access to digital resources and libraries, recreating face-to-face tutorial discussions

asynchronously online – all of them good, incremental improvements in quality and flexibility, but nowhere near being transformational.

What might we be doing? Let's look at it through the lens of the learner, and embrace all those vaulting ambitions in considering how they could combine to transform the educational experience of one individual. How can a young person who has always hated study, who believes further education is not for them, with few skills and low self esteem be persuaded to achieve their learning potential? The ambitions are right – their combined effect would certainly be to bring motivation, opportunity and support to that young person. But look at what it takes to achieve that: the processes of teaching and learning have to engage their attention so that they enjoy study; the knowledge and skills they need must link to their interests so they are motivated to study; they need constant personalized support and encouragement at the pace and level to keep them engaged; the content and process of learning must be compatible with their social culture; they need to be able to see the long-term value in the hard work of study – every teacher with a vocation to teach wants to provide all this, but in a non-elitist system this level of personalization cannot be offered for every student. The promise of new technology is that it can, for every one of those learner needs. It is an engaging and highly responsive medium; it can gather content according to interest; it can respond to individual needs of pace and level; it fits with the style and forms of youth culture; it can link the classroom to the workplace and in doing so enables teachers to provide much more of what only they can do for their students. Wherever we find an impossible challenge to inclusive educational provision, there is usually a way in which digital technology could make a significant difference.

But we focus the majority of technology provision on what we already understand – information systems, data gathering, communication processes, presentation – rather than using it to tackle the really difficult problems presented by our ambitions for universal and effective education. Imaginative use of digital technologies could be transformational for teaching and learning, taking us well beyond the incremental value of more accessible lecture presentations. The problem is that transformation is more about the human and organizational aspects of teaching and learning than it is about the use of technology. We have the ambition. We have the technology. What is missing is what connects the two. If education leaders were fully engaged with this, it would be strategy, and we would have a top-down change process. If practitioners were fully engaged it would be experimental innovation, and we would have a bottom-up change process. Better to have both, but too many educational institutions still lack serious leadership engagement with the innovative application of digital technologies. In any case, innovation in the pedagogical aspects of teaching and learning should be coming from the academic community. That is the focus here.

In this book, learning technologists from the UK and further afield pool their ideas around one way of accelerating the exploitation of digital technology: bringing its creative use within the capability of the individual teaching

professional. By setting out to explore the design of learning activities in educational contexts already rich in electronic and mobile technologies, the authors show us what a technology-aware future for education would be like.

When our education system is making sophisticated use of e-learning it will pervade everything we do, just as paper technology does. Lecturers will count it as part of their professional responsibility to ‘design for learning’, using a variety of forms of digital technology. We will have discarded the idea that the problem of pedagogic innovation can be left to the commercial suppliers, and instead see their role as being the provision of the tools and environments that lecturers can use in all the creative, innovative and scholarly ways they currently use paper technologies. We don’t expect the publishers to write the textbooks, we shouldn’t expect them to create the educational software for us either. The authors collaborating on this book are providing the means for this to be possible, researching and developing the forms of learning activity, the tools for pedagogic design, the environments for collaborative practice, the conceptual frameworks, all of which will contribute to building the bridges between what digital technologies make possible, and what our educational ambitions require.

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Abbreviations

AI	artificial intelligence
AIM	access and identity management system
ANT	Actor Network Theory
API	Application Programming Interfaces
AUTC	Australian University Teaching Committee
BYOD	bring your own device
CAD	computer-aided design
CADMOS	Courseware Development Methodology for Open instructional Systems
CC	Creative Commons
CERD	Centre for Educational Research and Development
CETL	Centre for Excellence in Teaching and Learning
CHIC	Courseware for History Implementation Consortium
CLFP	Collaborative Learning Flow Pattern
CMC	computer-mediated communication
CMS	courseware management system
CPD	continuing and professional development
CSCL	computer supported collaborative learning
EML	Educational Modelling Language
FAQ	frequently asked question
FDTK	Fund for the Development of Teaching and Learning
GPS	global positioning system
ICT	information and communication technology
IEEE	Institute of Electrical and Electronic Engineers
IMS	originally Instructional Management System(s); now usually refers to IMS Global Learning Consortium and its interoperability standards and specifications
IMSLD	IMS Learning Design
IP	informant practitioner
IPR	intellectual property rights
ISD	instructional systems design
IT	information technology

JISC	Joint Information Systems Committee
LAA	learning activity authoring
LAMS	Learning Activity Management System
LD	Learning Design
LDVS	Learning Design Visual Sequence
LMS	learning management system
LOM	Learning Object Metadata
LOR	Learning Object Repository
MIT	Massachusetts Institute of Technology
MOOC	massive open online course
OCSLD	Oxford Centre for Staff and Learning Development
OEP	open educational practices
OER	open educational resources
OOC	open online course
OSID	Open Service Interface Definition
PAT	Pattern Analysis Template
PBL	problem-based learning
PCK	pedagogical content knowledge
PLE	personalized learning environment
REAP	Re-Engineering Assessment Practices
RLO	reusable learning object
SCORM	Shareable Courseware Object Reference Model
SIG	special interest group
SLM	structured learning module
STEM	science, engineering, technology and mathematics
TESEP	Transforming and Enhancing the Student Experience through Pedagogy
TLTP	Teaching and Learning Technology Programme
TPCK	technological pedagogical content knowledge
UML	Unified Modelling Language
URL	universal resource locator
VLE	virtual learning environment
X-Delia	eXcellence in Decision-making through Enhanced Learning in Immersive Applications
XML	Extensible Markup Language

An Introduction to Rethinking Pedagogy

Helen Beetham and Rhona Sharpe

In her foreword, Laurillard encourages us to build bridges between the technologies we have at our disposal and the ambitions we have to transform post-compulsory education. Throughout this book we argue that this can be achieved by a reconsideration of the pedagogical practices that underpin education. As learning contexts are increasingly rich in electronic and mobile technologies, so research into e-learning has more to offer the mainstream of educational practice. The chapters collected here offer a critical discussion of the issues surrounding the design, sharing and reuse of learning activities, and offer tools that practitioners can apply to their own concerns and contexts. The aim is to bring the insights of learning design into the educational process, and to extend the repertoire of tools and techniques in everyday use.

What is pedagogy?

The term ‘pedagogy’ is not without its critics, particularly in the field of post-compulsory education from which many of the ideas and practices of this book originate. Malcolm Knowles, for example (1990), notes that the term derives from the ancient Greek word *paidagogos*, meaning the slave who led children to school, and argues that this makes it inappropriate for the years beyond school in which learners gain in self-direction and self-reliance. Others have found the usual definition of pedagogy as the ‘art or science of teaching’ at odds with their preferred emphasis on the activity of learning. In a truly learner-centred environment, they suggest, teaching should not be the focus of concern.

These debates and difficulties are, in fact, one reason why we have chosen to foreground the term ‘pedagogy’ in this book. First, despite its etymological connection with children (*paidia*), contemporary use of the term has lost its exclusive reference to childhood while retaining the original sense of leading or guiding to learn. We observe that the need for guidance is not confined to childhood, and that even the most self-directed of adult learners can benefit from the support of others. At a time when learning is increasingly seen as a lifelong project, it makes sense that the associated ‘art or science’ of guidance should extend its scope into adulthood. And as – in the West at least – the boundaries

are becoming blurred between school and college, formal and informal education, learning *for* work and learning *at* work, it also makes sense to consider the continuities across different contexts of learning. How people learn, and how they can best be guided to learn, are no longer concerns that belong behind school gates.

Second, the word ‘pedagogy’ embraces an essential dialogue between teaching and learning. This is particularly significant in a context of educational discourse in which the two terms have come to be used in tension and even in opposition to one another. In extreme cases, the term ‘teaching’ is seen as denying the active nature of learning and individuals’ unique capacities to learn (see for example the review by Alexander 2002). How are we to make sense of this apparent contradiction?

In the last century, a series of educational thinkers in the West sought to reinstate ‘learning’ as the central concern of pedagogy, arguing that undue emphasis had been placed on the content of what was taught, and that this had led to rigid and unhelpful habits of instruction. These trends in pedagogical thinking are discussed in more detail in Chapter 1. Taken together they amount to a new emphasis on the individual capacities and needs of learners. Learners are no longer seen as passive recipients of knowledge and skills but as active participants in the learning process. Fields such as psychology and cognitive science have contributed to our understanding of how this process takes place, and how it can differ from one learner to another. Social scientists have demonstrated the impact that social and cultural contexts have on people’s engagement with learning. Rightly, there is excitement about these advances and eagerness to ensure that they are set at the heart of educational practice.

One of the ways in which this revolution has been acknowledged is in the privileging of the term ‘learning’ over ‘teaching’ in educational discourse. Throughout this book, we use the term ‘pedagogy’ in the original sense of guidance-to-learn: learning in the context of teaching, and teaching that has learning as its goal. We believe that guiding others to learn is a unique, skilful, creative and demanding human activity that deserves scholarship in its own right. We will not be afraid to use the term ‘teaching’ as well as ‘learning’ in this volume, recognizing that education concerns not only how people learn ‘naturally’ from their environment but also the social interactions that support learning, and the institutions and practices that have grown up around them. In fact, the essential dialogue between these two activities is at the heart of what we mean by ‘pedagogy’, and helps us to reclaim the idea of teaching from negative associations with dominant, unresponsive, or even repressive forms of instruction.

It will be seen from this discussion that there is a further complexity to the term ‘pedagogy’. As well as referring to the activities of learning and teaching, it is also used to describe how we think and talk about, plan and structure those activities when we are not actually engaged in them. From the time of Plato at least, thinkers have proposed specific theories of – as well as methods for – education. Pedagogy, then, involves ways of knowing as well as ways of doing.

Like other applied disciplines, it is centrally concerned with how we understand practice (the ‘evidence base’ for theory), and how we apply that theoretical understanding *in practice* once again.

Ironically, the establishment of education as a field of study in its own right has helped to divide these two elements, so that within the same institution there may be professionals ‘doing’ teaching and professionals researching, thinking and writing about teaching who never have contact with one another. Educational developers, following the example of Schön (1987), have established the ideal of *reflective practice* as one means of reconnecting the two aspects of the discipline. Practitioners are encouraged to continuously evaluate the impact of their own pedagogical approaches and choices on their learners. At the same time, educational researchers and thinkers have used the term *scholarship of teaching* to describe the body of theory they have developed and the ways in which it can be applied (Trigwell *et al.* 2000). Rightly, the techniques used by reflective practitioners and by scholars focused on the pragmatics of teaching – such as evaluative methodologies, conceptual toolkits, and model teaching approaches – often resemble one another quite closely. In using the term ‘pedagogy’ we are therefore initiating a dialogue between theory and practice, as well as between learning and teaching, which draws consciously on these traditions.

If we are serious about this dialogue, we must acknowledge that pedagogy needs to be ‘re-done’ at the same time as it needs to be ‘re-thought’. Throughout this book we have tried to keep theoretical arguments and real-life examples of practice in alignment with one another. Many creative and innovative teachers have been involved in providing ideas for this book so that our theories can be rooted in the practical business of guiding learners to learn. Our understanding is that neither of these two activities – the doing or the thinking – makes sense in isolation from the other.

The digital age

If the last century did so much to reinvent the art or science of teaching, why does pedagogy need to be re-thought again just now? This is a particularly urgent question in relation to the new digital technologies, because teachers who are excited about these technologies are often accused of using them regardless of whether or not they are pedagogically effective, and even in ignorance of the long tradition of pedagogical evidence and thought. The argument that technology should be at the service of effective learning experiences is one with which all the authors in this book would concur. However, we would take issue with the idea that there is nothing particularly new for educators to consider as digital technologies enter the frame.

Papyrus and paper, chalk and print, overhead projectors, educational toys and television, even the basic technologies of writing were innovations once. The networked digital computer, and its more recent mobile and wireless counterparts are just the latest outcomes of human ingenuity that we have at our disposal. It

is true that none of these technologies has changed human beings' fundamental capacities to learn, if learning is understood in purely cognitivist terms. But they have profoundly changed how ideas and practices are communicated, and what it means to be a knowledgeable or capable person. While this book will situate discussions about the new technologies for learning firmly within established educational discourse, we also contend that these technologies represent a paradigm shift with specific and multiple impacts on the nature of knowledge in society, and therefore on the nature of learning. The final chapter looks in more detail at this paradigm shift and considers what it means to design for learning in a period of radical and uncertain change.

In rethinking pedagogy for an age of digital information and communication, then, we are not trying to define some new aspect or area of the discipline: we are trying to re-articulate the entire discipline in this new context. The danger of 'business as usual' with digital enhancements – when they are proven effective – is that we reproduce existing practices rather than appreciating where digital technologies have the potential to disrupt norms, challenge assumptions, innovate disciplines and professions, and usher in completely new forms of learning activity.

So how do digital technologies constitute a new context for learning and teaching? The technical advances are relatively easy to identify. The latest figures for access to the Internet in the UK are that 77 per cent of households have Internet access, but the modes of access are changing with 45 per cent of users having accessed the Internet from a mobile phone. For the 16–24-year-old group, social networking is the main online activity (Office for National Statistics 2011). Personal web pages, blogs, podcasts and wikis are democratizing the creation of information; social software is allowing participation in online communities that define and share the information they need for themselves. Individuals have access to processing power in personal applications that even five years ago would have been confined to specialist institutions. Personal mobile and wireless devices are increasingly integrated with the global computer network, to provide seamless, location-independent access to information services. Chapters 14 and 16 deal with some of these technologies in terms of their specific impacts on, and benefits for, learning.

But what of the social and cultural changes that have accompanied these technical developments? The phrase 'information age' was coined by Manuel Castells (1996) to describe a period in which the movement of information through networks would overtake the circulation of goods as the primary source of value in society. Some of the social and cultural reorganization that he predicted can already be traced in the ways that the contexts of education are changing.

Epistemologically, for example, what counts as useful knowledge is increasingly biased towards what can be represented in digital form. Many scientific and research enterprises now depend on data being shared in the almost instantaneous fashion enabled by the Internet. Vast libraries have been digitized, and there are movements to ensure that governmental and publicly funded scientific

data are openly available online. Open educational resources of the highest quality can be accessed – for the cost of getting online – by people who will never see the inside of a university. Academic institutions have a central role to play in these developments and in the debates over personal data and copyright that increasingly shape our digital information landscape. However, less thought has been given to the knowledge that is forgotten or lost in the process of digitization: practical skills, know-how that is deeply embedded in the context of use, and other tacit knowledge associated with habits of practice (Dreyfus and Dreyfus 1986). Ironically, it may be exactly this kind of knowledge that is drawn on by effective teachers, and by effective learners too, in their most transformational work.

What are the educational goals in a world where the knowledge and skills that were once valued are changing (Facer 2011)? The nature of work in Western societies has altered beyond recognition, and learning institutions have changed their offering in response. As more and more jobs demand advanced levels of ICT use, graduate employability has been refigured as the acquisition of capabilities – new forms of literacy and numeracy, adaptability, problem solving, communication – rather than the mastery of a stable body of knowledge (Barrie 2007). And as the job market demands ever more flexibility and currency, post-compulsory education has been reorganized around a model of constant updating of competence – lifelong learning or continuous professional development.

Technology has also had a profound impact on educational organizations themselves. Schools and colleges are networked in a way that cuts across traditional institutional sectoral, and even national boundaries: if not yet completely ‘borderless’, the walls of the classroom are increasingly see-through. Learners are more mobile between institutions than could have been imagined before standardized credit, e-portfolios and personal learning records – all of which require digital technology to be implemented at scale. As learners have more choice about when and how – and whether – they participate in formal education, they are also interacting with educational institutions in a way that is increasingly mediated through digital systems. They probably use a public website to find out about courses of study, apply and enrol online, contact tutors by email, access course information and resources through a managed learning environment, take examinations and receive grades via a computer-based assessment system. Colleges increasingly see the need to present study opportunities in transparent and open ways if they are to attract students and meet their expectations once enrolled (McGill 2011).

The wholly virtual learning experience is still a minority choice, and most such courses are provided by specialist institutions such as the Open Universities of the UK and the Netherlands, or Phoenix University in the US. Institutions of this kind are now competing with more traditional universities and colleges for market share, and this is having an impact on the way that all educational institutions relate to their learners, and to potential learners in their communities. For example, the UK Open University has made much of course content

openly available and is encouraging everyone to engage in some small way with its knowledge, whether through watching a television documentary, ordering a poster, downloading a podcast, browsing course materials, discussing them with other learners, participating in a massive open online course, or finally, signing up for a fully online course (Bean 2012). This represents both a marketing strategy and a public expression of the institution's mission and values.

Finally, learners themselves are changing. Most young people in Western societies make routine use of the Internet and email, text messaging and social software, file sharing sites, cloud services and mobile devices. Their familiarity with these new forms of exchange is carried over into their learning. Beyond whatever engagement with technology is required by their institution or course of study, learners use the communication and information tools they have to hand to help manage their learning. Indeed some curriculum transformation projects have found that more progress can be made by allowing students to choose their own technologies (McGill 2011).

Some of the habits of mind associated with personal and social technologies are regarded by teachers as unhelpful, particularly the often uncritical attitude to Internet-based information, and the cut-and-paste mentality of a generation raised on editing tools rather than pen and paper. There have been worrying findings that such behaviours are persisting even until doctoral studies (British Library 2012). The brevity of chat and text pose a challenge to traditional standards of spelling and grammar, and there is no doubt that the use of personal technologies creates new inequalities among learners. Teachers should be free to respond critically, as well as creatively, to these new technologies, but they cannot afford to ignore them if they want to engage with their learners.

This is not a book about social change – many others have covered this terrain – but it does take change within and beyond the educational organization as essential background for understanding the new pressures on learning and teaching. Against the argument that new technologies make 'no significant difference' (Russell 2001), we contend that learning is a set of personal and interpersonal activities, deeply rooted in specific social and cultural contexts. When those contexts change, how people learn changes also. We do not intend by this argument to suggest that educational practice is determined by technology *per se*. The developments outlined in this section were not pre-destined when the first two computers were networked by Thomas Merrill and Lawrence G. Roberts in 1965. Such events may dictate that our society and its relationship with knowledge will change, but not what form or direction those changes will take. Otherwise there would be little point in a book such as this one, in which we lay out some of the alternative possibilities over which we, as human actors, have decisions to make. Understood as a social and cultural phenomenon, technology cannot but influence the ways in which people learn, and therefore what makes for effective learning and effective pedagogy.

The idea of 'effectiveness' in this discussion should alert us to the fact that pedagogy and technology also involve issues of value. Just as the impact of

technology is changing how knowledge is valued in our society, so it is also changing how we value different kinds of learning and achievement, and different models of the learning organization. Some values, such as the values of the marketplace and the values of the traditional academic institution, are brought into conflict by the effects of technology. Though different contributors to this book have different perspectives on these debates, we will be explicit about the alternatives wherever we find conflicts over value arising.

Design for learning

If ‘pedagogy’ helps to locate this book within a tradition of thinking about learning and teaching, ‘design’ helps to identify what is different and new about the ideas we are proposing. Why is ‘design’ a good term around which to reclaim the scholarship of teaching, and to rethink pedagogy for the digital age?

First, like pedagogy, design is a term that bridges theory and practice. It encompasses both a principled approach and a set of contextualized practices that are constantly adapting to circumstances. In other words it is a form of praxis, both in the widely used sense of iterative, reflexive professional learning (e.g. Kolb 1984) and in the more radical sense of developing a critical awareness in action, in order to bring about transformation (e.g. Freire 1996).

Second, ‘design’ is a highly valued activity in the new digital economy, and a discipline – or capability within other disciplines – of increasing importance as more of our significant interactions take place via designed spaces or interfaces. In the academic world, we have already touched on the impact that new information technologies have had on what counts as valuable knowledge. This change has been variously characterized by commentators as a ‘postmodern turn’ (e.g. Hassan 1988) or as a shift from ‘mode 1 to mode 2’ knowledge (Gibbons *et al.* 1994). In either case, knowledge comes to be seen as provisional, contextualized, culturally specific, constructed or designed rather than discovered. This shift is not without its critics, particularly from within the natural sciences and other ‘enlightenment’ disciplines of the academy. It can seem at odds with the academic values of disinterested, independent investigation. Nevertheless, even within these disciplines, knowledge is understood to have specific uses and users, and the ways in which it is communicated to those users have become an essential aspect of what is known. Design has therefore become a valued activity in many academic disciplines as well as in graduate professions.

Third, quality assurance of courses and professionalization of teaching have meant an increasingly formal approach to course design. ‘Designs’ in the form of lesson plans, validation documents and course handbooks are routinely produced as evidence for quality enhancement or personal/professional review. Although it takes different forms in different states, the desire of national governments to establish the ‘return on investment’ available from higher and further education has added to the pressure to standardize representation of educational design processes and their outcomes.

So design is both a significant aspect of professional practice in education and a powerful metaphor for the approach teachers take to the learning of others. As in other areas of professional practice, the process of design in education involves:

- *Investigation*: Who are my users and what do they need? What principles and theories are relevant?
- *Application*: How should these principles be applied in this case?
- *Representation or modelling*: What solution will best meet users' needs? How can this be communicated to developers and/or directly to users?
- *Iteration*: How does the design stand up to the demands of development? How useful is it in practice? What changes are needed?

Teaching has always involved 'design' in these senses, though it has also always recognized the process of learning as emergent – valuing the capacity of teachers to respond in the moment – and performative – valuing what teachers can accomplish with their voice and physical presence. With the use of digital technologies, new elements of the learning situation ask to be planned or designed for in advance. Teachers continue to be responsive and to give engaging performances, but sometimes these interactions with learners may be via digital media either live or asynchronously. An interesting and unforeseen consequence of the greater reliance on technologies in education has been that aspects of pedagogic practice become more visible and so more available for reflection, revision and review.

'Design for learning' is a phrase we have coined for the process by which teachers – and others involved in the support of learning – arrive at a plan or structure or designed artefact for a learning situation or setting. The situation may be as small as a single task, or as large as a degree course. In a learning situation, any of the following may be designed with a specific pedagogic intention: learning resources and materials; the learning environment; tools and equipment; learning activities; the learning programme or curriculum. In this book we are mainly concerned with the design of learning activities and curricula. For practitioners, who are rarely involved in the design of the materials and environments they are offered as pedagogically useful, the crucial questions are: how can I choose from, use, adapt and integrate the materials available to me to provide a coherent experience for my learners? Our aim is to focus on design as a holistic process based around the learning activity, in which designed elements such as materials and environments must also be taken into account.

When we talk about design for learning we are viewing design as an intentional and systematic, but also a creative approach to the encounter of learners with subject matter and task requirements. In reality learners and learning situations are unpredictable: as teachers, we encourage learners to engage in dialogue with us, to respond individually to learning opportunities, and to take increasing responsibility for their own learning. The use of digital technologies does not

alter this fundamental contract. We acknowledge, then, that learning can never be wholly designed, only designed *for*, from principled intentions but with an awareness of the contingent nature of learning as it actually takes place. This contingency demands constant dialogue with learners, recognizing that effective designs will evolve only through cycles of practice, evaluation and reflection. Also in this book, ‘learning designs’ will be used to mean representations of the design process and its outcomes, allowing for aspects of design to be shared.

In using the term ‘design for learning’ we are conscious that ‘Learning Design’ is a discipline in its own right, with its own specific protocols and modelling language (Jochems *et al.* 2004; Lockyer *et al.* 2008). Historically, Learning Design has emerged from instructional design, but with a focus on learning activity as the central concern of the design process. The theoretical scope of Learning Design, and particularly its goal of providing a generalized means for describing and sharing learning activities, is clearly relevant to our project. All the authors of this volume would like to see pedagogical ideas discussed in ways that are meaningful across different settings. However, pursuit of this aim has uncovered many challenges, some of which are discussed in chapters by Masterman, Conole, McAndrew and Goodyear, and Ellaway. Some general principles can certainly be offered, but it is an open question whether general designs or patterns exist that make sense across a wide range of different learning contexts. Individual contributors to this book have different views on this question.

Reading this book

As we have outlined, a number of approaches – theoretical, practical and research-led – are relevant to effective design for learning. Part I of this book, Principles and practices of designing, outlines our current understanding of how people learn and of how planned, purposeful activities can help them to learn more effectively. Chapter 1 looks in detail at the principles and theories that are relevant to pedagogic design, while Chapter 2 suggests how these might be applied to the design of specific learning activities. Broader considerations for the design of complex learning environments are dealt with in Chapter 3. Moving on from theory to practice, Chapter 4 presents evidence that how practitioners actually design for learning may be a much less rational – and more responsive – process than design protocols allow. A number of design tools and environments are explored in Chapter 5, while the challenge of representing and sharing real designs for learning is addressed in different ways by the authors of Chapters 6 to 9.

Specific contexts are given more detailed consideration in Part II, Designing for learning in context. Starting with the practice of design which takes place in course teams (Chapter 10), we go on to discuss specific disciplinary aspects of design, recognizing not only that there are many differences in pedagogical cultures between the subject areas (see for example Meyer and Land 2005),

but that the discipline of educational design itself has different faces and draws on different traditions. We also include consideration of institutional cultures (Chapter 13) and the specific technical advances in mobile and wireless computing (Chapter 16), not simply to illustrate general points made in the first half but as an intrinsic part of our exploration of what ‘design for learning’ means. The final chapter looks towards an uncertain future and asks how we design for resilience and adaptability.

Each chapter opens with a brief introduction from us, the editors, to help guide your reading. Part III provides a range of conceptual tools that we hope you will find useful in your own communities and contexts of working.

References

- Alexander, R.J. (2002) ‘Dichotomous pedagogies and the promise of comparative research’, paper presented at the American Educational Research Association Annual Conference, New Orleans, April 2002.
- Barrie, S.C. (2007) ‘A conceptual framework for the teaching and learning of generic graduate attributes’, *Studies in Higher Education*, 32 (4): 439–58.
- Bean, M. (2012) ‘Great expectations: not a choice, a reality’, Keynote to the Higher Education Academy conference, Manchester, July 2012.
- British Library/JISC (2012) Researchers of tomorrow: the research behaviours of Generation Y doctoral students. British Library and JISC. Online. Available at <http://www.jisc.ac.uk/media/documents/publications/reports/2012/Researchers-of-Tomorrow.pdf> (accessed 18 July 2012).
- Castells, M. (1996) *The Rise of the Network Society, The Information Age: Economy, society and culture*, Oxford: Blackwell.
- Dreyfus, H.L. and Dreyfus, S.E. (1986) *Mind over Machine: The power of human intuition and expertise in the age of the machine*, Oxford: Basil Blackwell.
- Facer, K. (2011) *Learning Futures: Education, technology and social change*, London and New York: Routledge.
- Freire, P. (1996) *Pedagogy of the Oppressed*, (trans. Ramos, M.B.) London: Penguin.
- Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P. and Trow, M. (1994) *The New Production of Knowledge*, London: Sage.
- Hassan, I. (1988) *The Postmodern Turn: Essays in postmodern theory and culture*, Ohio: Ohio State UP.
- Jochems, W., van Merriënboer, J. and Koper, R. (2004) *Integrated e-Learning: Implications for pedagogy, technology and organization*, London: Taylor and Francis.
- Knowles, M.S. (1990) *The Adult Learner: A neglected species* (4th edition), Houston: Gulf Publishing.
- Kolb, D.A. (1984) *Experiential Learning: Experience as the source of learning and development*, Englewood Cliffs, NJ: Prentice-Hall.
- Lockyer, L., Bennett, S., Agostinho, S. and Harper, B. (eds) (2008) *Handbook of Research on Learning Design and Learning Objects: Issues, applications and technologies*, Hershey, PA: IGI Publishing.
- Office for National Statistics (2011) Internet Access – Households and Individuals. Online. Available at http://www.ons.gov.uk/ons/dcp171778_227158.pdf (accessed 9 July 2012).