

## Preface

This book is about theorising technology and education and how we can theorise better. It will be particularly valuable for those interested in researching the ways in which technology has influenced teaching and learning – across different sectors and in both formal and informal settings. However, it will also have a more general appeal to those interested in, and perhaps flummoxed by, the idea of theory, in respect to education and social research in general.

The aim of the book is then to clarify the idea of theory and to encourage researchers to be more theoretical. I am interested in promoting discussion of theory and while I provide a clear agenda for how we can theorise better, this is not a ‘how to research’ guide. Moreover, my aim is to promote theorising, not a particular theoretical framework or theory. At this point, I do recognise that there are plenty of books on technology and digital tools in and beyond the classroom and for that matter several books on theory and theorising, so why another one? I have three main objectives.

First, I want to show that theory need not be so mystifying a concept if we think about it in broad and inclusive ways. Theory comes with many different associations, but at heart it is about providing an explanation, not any explanation but one that is backed up using concepts and ideas from a wider field of study. This is not difficult to understand even if discussion of theory is often emotionally charged. It is, after all, a major put- down to be told that our work is lacking theory or that we have misunderstood theory X or theory Y. Yet those who are so eager to critique the theoretical efforts of others often believe that theirs is the only legitimate version of theory and fail to set out what they mean by theory in the first place. We should not let that put us off offering theoretical claims of our own and doing so on our own terms.

Second, there have been strong criticisms of research into technology and education and a perceived lack of theoretical rigour within the field. Researchers have been criticised for superficiality, for being guided by novelty, and for offering romanticised accounts of technology. I accept some of this, but I want to use the book to offer a more balanced view of the field.

Third, technology is routinely described as ‘new’ but its use in education goes back decades. For those that care to look, there is a long history of experiments with technology for learning, taking in educational radio and television, tape recordings, old- style projection devices and so on.

Indeed, there is a rich history of the use of computers themselves with terminals introduced into some schools as long ago as the 1970s and the microcomputer taking off in many schools in the 1980s. I want to show the importance of looking back on what has gone on earlier. If we do not do this then we have missed opportunities to theorise and to write about technology in a more critical way.

### **Structure of the book**

The book is organised around seven chapters. Each chapter begins with a brief signpost to what is covered and how the chapter fits the overarching flow of the book. Chapters end with a summary and suggestions for further reading. Sections are, wherever helpful, illustrated using examples to draw attention to strengths or shortcomings in a particular research tradition.

Longer case studies are also supplied to show a research approach in more depth. The studies I cite take in different contexts, though there is probably more on schools as this is where some of the debates have been most vigorous. Some of the studies are more convincing than others, but I have tried not to include too much which is obviously methodologically flawed. This does not stop me making forceful criticisms at times.

Chapter 1 sets the book in motion by asking ‘What is theory?’. I look at several associations made with the word. For some, theory is about uncovering causal relationships between variables X (for example, technology) and Y (learning outcomes) or modelling the various factors that combine to produce an outcome. A different theoretical goal, particularly in qualitative research, may be putting forward a new concept (for example, ‘online presence’) to capture a phenomenon and charting the consequences of this phenomenon for teaching and learning. Theory can also be normative (what ought to happen) and theory in the field of education often has an action orientation that sets it apart from social science. We can then see theory in all aspects of social research but if there is one recurring idea about theory it is that of providing an explanation and different kinds of explanations are discussed. I finish the chapter by looking at criticisms of research into technology in education and asking are these criticisms fair?

If theory is a difficult term then theorising is no easier. In Chapter 2 I see theorising as associated with a move from descriptive to more explanatory reporting. So far, so good. However, explanations come in different shapes and sizes and I am particularly interested in theoretical explanation that draws on subject knowledge – of course subject knowledge of technology in education, but also of education and social research in general. The work of theorising may be

undertaken in a step- by- step manner but it often involves a leap of imagination too, enabling the researcher to see the data in a new and more coherent way. These leaps of the imagination, often described as abduction or guesswork, are difficult to describe and cannot be legislated for, but they do not come out of nothing. They are products of an intense engagement with the concepts and approaches researchers have read and thought about over the course of their project. Thus, a good place to start if we are to theorise better is to explore the concepts and vocabulary we have inherited in the field of technology and education. Of course, not everything can be covered but in the following three chapters I look at research on: learning and technology; teachers and technology; and technology itself. I show how theoretical approaches have been employed in these areas and how they have sharpened our thinking.

Chapter 3 focuses on learning and technology and looks at learning theory. I go back to ‘traditional’ learning theories of behaviourism, cognitivism and social constructionism as associated with Vygotsky before looking at social theories of learning, including community of practice, and examples of distributed learning specific to technology mediation. Theories of learning work by focusing attention on what is important and help both the researcher and practitioner make sense of an otherwise overwhelming context. However, theories come with shortcomings and some are tempted to claim that advances in learning analytics and artificial intelligence have obviated the need for theory given the sheer quantity of data that can be drawn on and the speed with which these data can be processed. It is a view that I critique.

Chapter 4 looks at schools and teachers and their use of technology. Here is a paradox. Computers can offer powerful support for learning but even when problems of access have been addressed the take- up of technology has often disappointed. Teachers often say they are keen to use technology and in many countries will use digital devices in their personal lives, but they seem reluctant to use it in the classroom. Why is this? Tyack and Cuban (1995), in an influential contribution, explained that technology did not seem to fit the ‘grammar of schooling’; teachers were constrained by the curriculum they had to get through and the pattern of the school day. Since interventions by Tyack, Cuban and others we now have more social psychology approaches, such as ecological theory, and sociology approaches, such as activity theory, on which to draw. These approaches show how teachers’ work is embedded in wider systems that constrain their actions and, at their best, allow us to see opportunities for change.

Chapter 5 goes into the theorisation of technology itself. Here there is another paradox: researchers interested in technology and education have not always had a lot to say about technology itself. Rather there has been a technocentric tradition which has tended to assume tools will be used as intended by designers and teaching experts across different contexts. Of course, this is not the whole story and I look at alternative ways of conceptualising technology, including the idea of affordances as first put forward by Gibson. I then go on to look at efforts to see technology use in hybrid and ecological contexts, and this takes us into the language of assemblage, that is, networks of people and artefacts. I look too at ways in which technology use is shaped by social and commercial forces before finally considering more action- oriented approaches, including participatory design and design thinking.

Having looked at some of the debates about technology, and its use in teaching and learning, I turn in Chapter 6 to wider narratives about technology itself. Here there is both excessive optimism and pessimism about the impact of technology and this is distorting the discussion of digital tools in school and beyond. I argue for a more balanced view which better accounts for the context in which technology is used and acknowledges the different ways that technology is experienced by users. Moreover, there is something inherent in the technology which means it offers both opportunity and constraint, rather than easy answers. An important question is not whether technology is in itself an asset for teaching and learning, but how can we use technology for desirable educational ends.

Finally, in Chapter 7 I reprise some of the key arguments made in the book and suggest we need a research community which values different kinds of theoretical contribution, while maintaining a distinctive focus on education. This community will consider what is new, but will use the past as a guide to the present. Community members will be enthused about technology but will not be afraid of standing on the sidelines and reminding anyone who cares to listen that claims for the impact of technology are often overstated and go unfulfilled. I then finish the chapter by suggesting ways in which individual researchers may theorise better in their own work. Theory is important, as without theoretical insight we are left to the whims of what is most novel or most touted by vested interests and/ or policy makers. Theory is for everyone.