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Foreword

Andrew Feenberg

In 1982 I was part of a team at the Western Behavioral Sciences Institute that created one of the first e-learning programs. We attracted professors from leading universities, excited about gaining access to a computer network, and business and government leaders interested in experiencing the new technology and able to afford the high cost of this early experiment. Our equipment was primitive by contemporary standards and enabled us to do no more than exchange messages online. The faculty elaborated a pedagogy based on discussion with and between the students. Gradually, other faculty at other institutions initiated similar experiments. But it was only in the late 1990s that university administrations and software companies showed an interest. Their involvement led to a huge expansion of access to online education, but their agenda was quite different from ours. While we were mainly intrigued by the educational potential of online discussion, they seemed more interested in automating higher education on the Internet. These divergent agendas emerging at the very origins of e-learning as a recognized field typify the field of educational technology.

In nearly every country in the world except the United States, education is the single-most costly item in the state budget. Yet there are grave doubts about the effectiveness of all this expense. It is widely believed that achievement has declined as educational opportunity has increased. Many researchers and political and corporate leaders continue to hope that technology can meet the challenge of mass education. After all, technology has vastly revolutionized production, distribution, and many services. Why not in education as well? Studies are conducted to ground this hope in numbers with the aim of justifying expensive investments today by the promise of future cost savings. Meanwhile, teachers propose other solutions, such as smaller class sizes, and these proposals are supported by other studies.

These debates over the problems of education would be more likely to lead to a conclusion if the various policy alternatives could be judged by the same standard. Funding and administrative agencies demand quantitative results. But professional teachers often feel that their knowledge is ignored by such research. Different methods

are privileged by these different actors and no “meta-method” exists to judge between them.

The issue is often formulated in terms of the distinction between quantitative and qualitative research. Qualitative methods are rooted in experience. They can articulate the informal knowledge acquired by teachers in the course of teaching and the common sense understanding of students. Much of this knowledge concerns what “works” in the classroom. Some of it is also contextual and has to do with institutional features of the educational system. Starting out from this basic experiential knowledge, social scientists elaborate more or less rigorous methodological approaches. But qualitative methods are contested for their lack of experimental grounding.

Quantitative research is modeled on the natural-scientific method and seeks to tease out causal connections from statistical correlations. Like the natural scientist, the researcher sees himself or herself as completely independent of the object of research and various checks are incorporated into studies to eliminate subjective bias. In the best case, research would supersede professional judgment in education as it has to a great extent in medicine. However, the results in education will never carry conviction to the same degree as controlled double-blind studies of many thousands or even tens of thousands of experimental subjects in medicine. Inconclusive studies give rise to the researchers’ worst nightmare, the phenomenon known as “no significant difference,” which appears to show that different practices and technologies have no impact on outcomes. This has very practical consequences.

Education is not a pill, and relationships between cause and effect are notoriously difficult to establish. Methodological conflicts and disagreements over strategies for improving education are intertwined in ways that block consensus. We have no choice but to learn to live without certainties. Many different perspectives must be brought to bear on the problems of mass education and many different solutions to those problems need to be experimented. The book you are reading is a plea for such methodological pluralism in the study of e-learning.

Education is complex and reveals different aspects from different points of view. Qualitative methods are too often overlooked and un-

dervalued but they can inform the study of technology in education, sharpening awareness of achievements and problems. Methodological self-awareness may refute assumptions that seem obvious but cannot stand up to informed scrutiny. Correctives to flawed quantitative studies can be developed.

Since teachers have access to research results, these flow into the field and influence practice for better or for worse. This is especially true of the qualitative methods described here, which are often more accessible and open to commonsensical application and adoption. These methods can help teachers make their tacit understanding of their work explicit and so subject to criticism and refinement.

Thus a survey such as this one has a double purpose: to inform researchers of the variety of available methods, and to enable teachers to appreciate the contributions of research to their practice. The latter is particularly important in the field of e-learning, which has yet to establish a uniform culture guiding the expectations of teachers and students.

When we first explored the potential of computer-mediated communication in the early 1980s, I wrote that this new form of communication was uniquely reflexive because so many of its codes were still uncertain. At the time I thought that by the first decade of the twenty-first century the field would have settled into a familiar pattern. But rapid changes in technology and usages have refuted my expectations. E-learning is an example of a domain of communicative practice that is still in flux nearly thirty years after its earliest emergence. This book can contribute to the realization of its potentials.

Acknowledgments

An overview like the one provided in this book can emerge only through extensive dialogue with friends and colleagues, across disciplines, research orientations, and national boundaries. The author therefore has many specific contributions to acknowledge and many individuals to thank.

For many lively discussions and exchanges of ideas on matters of e-learning research generally and issues of culture, narrative, genre, and media in particular, a considerable debt of gratitude is owed to Liam Rourke and Theo Hug. For a recent and rich postdoctoral experience that contributed much to the treatment of critical theory and critical-historical research in this book, I thank Andrew Feenberg and members of his Applied Communication Lab at Simon Fraser University. Darryl Cressman and Edward Hamilton are two students at this research center who deserve special mention, not only for their considerable assistance in gathering conversational data utilized in chapter seven of this book, but especially for helping me to gain a better understanding of my own field from a critical-theoretical perspective. The critique of cognitivism and the introduction to conversational analysis and discursive psychology in this book benefitted from the advice of W.M. Roth, and from guidance provided by psychologists Jack Martin, Tom Strong, and Henderikus Stam. Finally, the hermeneutic-phenomenological emphasis of the final chapters owes much to the continued support and guidance of Max van Manen. This section also reflects the ongoing influence and encouragement of my Scandinavian (and other) peers in phenomenological research, Tone Saevi and Carina Henriksson. The outstanding assistance of Johanne Provençal with issues of editing and strategies of organization and emphasis for this publication also deserves special notice.

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Material in various chapters appears elsewhere. Chapter 2 is based on an article, "Chronicles of Change: The Narrative Turn and E-Learning Research" appearing in *E-Learning* (vol. 5, no. 3); a version of chapter 3 appears in the *International Journal of Computer Mediated Communication* under the title "Genre and CSCL: The Form and Rhetoric of the Online Posting." Parts of chapters 4 and 5 appear in *Mind, Culture and Activity* (vol. 16) in an article entitled "Discursive Psychology and Educational Technology: Beyond the Cognitive Revolution." Finally, chapter 6 appears in *AI & Society* (vol. 23), and a version of chapter 8 has appeared in *Ubiquity* (vol. 9, no. 22; www.acm.org/ubiquity/volume_9/v9i22_friesen.html).

Chapter One

Introduction: Re-Thinking E-Learning Research

In the rapidly changing world of the Internet and the Web, theory and research frequently struggle to catch up with technological, social, and economic developments. Since the mid-1990s, for example, myriad business models and even an entire “new economy” associated with the Internet have risen to prominence and fallen into disrepute. The same period has also witnessed the rise of wikis, blogs, and other social software as new means of collaborative authorship and dissemination, of advocacy and social action. In the wake of such developments it becomes a significant challenge to interpret, differentiate, and disentangle hype and backlash, design and accident, as well as past certainties and future possibilities. In the social sciences generally, Internet and Web studies have emerged to address this situation by developing and adapting ethnographic, social-psychological, linguistic, critical, and other methodologies for this new virtual world. These fledgling fields provide valuable interdisciplinary contexts for investigating new online manifestations of identity, language use, and other cultural, commercial, and technical forms, from Aggregators through Facebook to YouTube.

In education, a similar proliferation of novel practices, applications, and forms—from bulletin boards to Webcasts and from online educational games to open educational resources—have come to be addressed under the rubric of “e-learning.” This is also a relatively new field for both practice and research. Its disciplinary cornerstones and precursors include instructional technology and design, distance education, and educational psychology. E-learning combines insights from these fields together with an emphasis on Internet and Web technologies in general. But so far, research in this field has gravitated toward many of the same methods and philosophical frameworks used to investigate and design earlier and quite different instructional technologies and practices. Above all, this research is marked by studies that reaffirm assumptions about the nature of technology, of human activity, and the interaction of humans and technology that have long been cast into doubt in other fields of research. Technical

progress, for example, is seen as single-handedly “impacting” education; human action is seen as fundamentally rational and rule-bound, while phenomena such as education and communication are understood according to models that are predominantly functional or technical in nature. These understandings have been contradicted by the complex unpredictability of technical, social, economic, and educational continuities and transformations, which continue to defy reductive explanation or predictive calculation. The challenge remains, then, for research in e-learning to be re-thought, to catch up with new developments in theory, and to reflect rapidly developing social and technical practices and configurations.

Re-Thinking E-Learning Research takes up this challenge by introducing and illustrating a number of research frameworks and methodologies relevant to e-learning. These include methods of narrative, content, genre, and discourse analysis, of hermeneutic-phenomenological investigation, and also, of critical and historical inquiry. These frameworks and investigations stand as examples of a few possibilities taken from the rich palette of methodological opportunities that can begin to address the ever richer and expanding subject matter proper to e-learning. Almost every chapter in this book both describes and applies a particular “alternative” research method to a common or emerging e-learning technology, practice, or phenomenon. Examples of these pairings of method and subject matter include narrative research into the adaptation of blogs in a classroom setting, the discursive-psychological analysis of student conversations with artificially intelligent agents, a genre analysis of an online discussion, and a phenomenological study of online mathematics puzzles. Nearly every chapter in this book, then, offers a discussion of technologies familiar to a wide range of students, teachers, and researchers in e-learning, and of methods that can readily be used in their investigation.

The subjects and methods discussed and illustrated in this book present important and timely examples and contextualizations intended for both Master’s and Ph.D.-level students in educational technology, instructional design, and distance education programs. Students who are seeking to learn about qualitative and alternative methodological possibilities and approaches available for their re-

search will be well-served by this book. This text will also be of interest to those researching, teaching, and studying technology and education from a variety of theoretical and academic perspectives, including curriculum studies, the history and philosophy of education, media and education, as well as Internet and new media studies. It will also be valuable to reflective practitioners or teachers who are working with new technologies of various kinds, and are interested in ways of thinking about technologies in educational contexts that avoid either reduction or hyperbole. This book, finally, could also be useful as a textbook for courses in educational technology and media, instructional design and distance education. This is especially the case in courses with a focus on research methods where there is an understood need to present students with a balance of both quantitative and qualitative, post-positivist and “naturalistic” approaches (Lincoln & Guba, 1985).

Defining E-Learning as Research and Practice

This introductory chapter provides more than just an overview of the contents of this book. It also presents an argument for re-thinking the way that e-learning is typically researched and outlines a “re-thought,” alternative approach to this kind of research. The chapter begins by examining and synthesizing dominant understandings or definitions of “e-learning” and of “e-learning research.” It then looks at the challenges and inconclusive results that have been produced thus far through these understandings of e-learning and its investigation. It advocates the adoption of an approach to e-learning that it refers to as “multivocal”: one that affirms a multiplicity of knowledge types or forms, rather than understanding knowledge in exclusively technical or natural-scientific terms. This chapter concludes by showing how this multivocal knowledge can be mapped out, and indicates how this multivocality is realized in the individual chapters of this book.

The term “e-learning” was first used in the mid-1990s as a shortened form of “Electronic learning” (OED, 2007). Since that time, of course, the term has been used to describe not only a kind of learning, but also practices in education, teaching, design, and research. Look-

ing at the way “e-learning” has been used in the titles of various books and articles indicates that it has come to represent a useful shorthand for a range of different orientations to research and to the use of technologies in education and learning. Often the precise way that the term e-learning is used is dependent on an author’s particular purposes or specific research agenda. For example, in *E-Learning and the Science of Instruction*, instructional designer Ruth Colvin Clark and cognitive psychologist Richard E. Mayer (2003) describe e-learning essentially in terms of multimedia technologies and theories of individual learning and cognitive processing: “E-Learning,” they explain, “should promote psychological engagement between the learner and the lesson content in ways that help learners to select, integrate, and retrieve new knowledge” (p. 151). In a book titled *E-Learning in the 21st Century*, distance education specialists D.R. Garrison and Terry Anderson (2003) speak of e-learning principally in terms of its “unique ability to bring together a community of learners, unrestricted by time or place” (p. 12). Instead of seeing a single learner engaged with content as the paradigmatic e-learning scenario, Garrison and Anderson understand e-learning primarily in terms of what they call a “collaborative constructivist” framework of learning and communal inquiry.

Despite these very different characterizations of e-learning—as predominantly individual on the one hand, and predominantly communal on the other—attempts at defining e-learning for general use have shown considerable consistency and agreement. “E-learning,” as educational technologist Rob Koper writes (2007), “can be defined as the use of information and communication technologies (ICTs) to facilitate and enhance learning and teaching” (p. 356). Other sources similarly indicate that e-learning designates “learning conducted via electronic media [especially], on the Internet” (OED, 2007). As educational technologist William Horton (2006) writes, e-learning “marshals computer and network technologies to the task of education” (p. 1). E-learning, then, designates the intersection of education, teaching, and learning with information and communication technologies. In addition, it gives special emphasis to technologies and practices associated specifically with the Internet and the Web. The utility and flexibility of this general definition is illustrated by its ability to em-

brace the emphases of Garrison and Anderson on “bringing together communities of learners” and of Mayer and Clark on “psychological engagement between the learner and the lesson content”: both refer to the conjunction of computer and especially Internet technologies with a particular conception of learning or education.

Designating the intersection of online technologies with learning and education, e-learning as a field is intrinsically interdisciplinary. It involves disciplines proper to technologies and technical design as well as fields related to the study of education, curriculum, and learning itself. E-learning, however, is not the first field of practice and research to take both technology *and* education simultaneously as its principal focus. It is preceded in this by at least two other disciplines, *educational technology* and *distance education*. Educational technology, which also goes by the name of instructional technology – and “computer based instruction” and “programmed instruction” before it – has concentrated on the integration of media and other technical artifacts into classrooms and other teaching and learning settings. Distance education, as the name itself implies, focuses on the systematic provision of education over distance and on the use of print, televisual, electronic, and other media for this purpose. The significance of distance education and educational technology for e-learning is also indicated by some of the definitions and orientations cited above and the disciplinary backgrounds of those who have authored them. For example, Garrison and Anderson, who characterize e-learning in terms of learning communities, are experts in distance education; and Koper and Horton, who provide definitions of e-learning more generally, are experts in educational technology. These connections are illustrative of the intellectual and practical continuities that link e-learning with these more established fields of study. They also suggest that e-learning, like any other field of endeavor, does not arise completely *sui generis* or without precedent, but that it inherits many of the strengths and also the limitations of the disciplines and disciplinary configurations from which it emerged.

At the same time, the interdisciplinary reach of e-learning extends well beyond educational technology and distance education. Because e-learning involves education, learning, and teaching, the interdisciplinary makeup of this field also includes the related disciplines of

psychology and instructional design. Again the connection of these fields to e-learning can be illustrated in terms of the specializations of some of the experts cited above. Richard E. Mayer and Ruth Colvin Clark, who define e-learning as the engagement of individual learners with multimedia, are writing from the perspectives of cognitive psychology and instructional design, respectively. This is illustrative of the close connection of cognitive psychology and instructional design to e-learning as a discipline. As in the case of distance education and educational technology, e-learning is in many ways constituted through the intellectual and practical legacy that it shares with these psychological and design fields. The individual characteristics of psychology and instructional design are as a result related to e-learning, too, and are therefore worth defining, however briefly.

Psychology, of course, refers to the systematic study of mental processes, behavior, and of human activity. Of all the disciplines with an immediate connection to e-learning, psychology is unique in that it has both practical and applied dimensions, in addition to well-developed theoretical and philosophical aspects or sub-disciplines. Both of the practical and theoretical dimensions of psychology are given significant attention in this book. Instructional design, on the other hand, has been described as a form of “applied...psychology in the best sense of the term” (Dick, 1987, p. 183). It is concerned with the design and development of instructional materials and activities to meet learning needs. Instructional design as a field generally investigates the instructional use of technologies and media through the application of systems science to organizational and educational processes.

E-learning can thus be defined as a field that emerges at the confluence of educational psychology and instructional design, of educational technology and distance education, and of recent technological developments related to the Internet and the Web. This way of defining e-learning generally is closely associated with specific ways of understanding e-learning research in particular. To use the words of educational technologist Rob Koper (whose definition of e-learning was quoted earlier), this research tends not to be “theory-oriented,” but rather “technology-oriented” in character. E-learning research, Koper (2007) explains, is not focused on “predicting or understanding

events [in] the world as it exists” (p. 356); it instead seeks to “*change* the world as it exists” (p. 356; emphasis added). E-learning or technology-oriented research, in other words, attempts “to develop new technological knowledge, methods, and artifacts” for practical ends or purposes (p. 356). It is this applied, practical, and technological research that Koper (2007) says is ideally suited to e-learning. E-learning is seen in this way as developing new technological knowledge, methods, and artifacts specifically with the aim of improving “learning, training and teaching” (p. 356). Koper sees this as occurring in a number of particular ways:

- By making [learning, training and teaching] more *accessible* to everyone at any place and at any time
- By making [learning, training and teaching] more *effective* by facilitating the implementation of advanced pedagogical and organizational approaches, [and]
- By making [learning, training and teaching] more *efficient* by providing advanced (partly automated) support mechanisms for learners and teachers to perform their various tasks. (p. 356; emphases in original)

E-learning research, in other words, is seen as harnessing predictive, technological knowledge “about the world as it exists” in order to change and improve this world—making technologies and techniques more effective, efficient, and better. Speaking in terms of the various disciplines and definitions discussed above, one can say that the point of e-learning research is to take the practical and theoretical knowledge of psychology, instructional design, distance education, and educational technology, and adapt it to the effective, efficient, and inclusive design of Internet, Web, and other advanced technologies for education. According to this definition, where a new technological innovation appears that could allow for gains in efficiency, effectiveness, or accessibility, it would be the task of e-learning research to investigate and optimize the results of its application.

E-Learning Research: Ripe for Re-Thinking?

Although this way of defining research in e-learning appears quite direct and simple, and presents a clear, pragmatic path for both development and research, a more in-depth look at the nature and implications of this definition reveals serious problems. These problems are of two kinds: First, this definition of e-learning research does not begin to address some practical and contextual aspects that are indispensable to understanding e-learning as the use of ICTs in learning and teaching. These are presented by human, cultural contexts in which learning, teaching, and ICT use take place, and include questions such as teaching and learning practices, personal and institutional decision making, and the conventions and cultures in which all of these things take place. A second problem is presented by past experience with the kind of “technology-” and improvement-”oriented” research described by Koper – namely, the inconclusive results or statistically insignificant measures that this kind of research has tended to produce. These two problems are considered here in order to underscore the need for new methodological possibilities and alternatives in this area of research.

First, education is generally a collective and organized undertaking, be it school-level education, job retraining, or university-level specialization. (Even if it is undertaken informally or independently, it is made possible and contextualized by others’ organized efforts.) This means that the deployment of technologies in e-learning settings of whatever kind is necessarily *not just* a technical or scientific problem. It is also necessarily collective, institutional, and even political in character. As such, it is and should be subject to examination and discussion that is of social and critical relevance, directed at issues of equity and social justice. Although social-critical research is of a very different kind than the natural-scientifically based technological research defined by Koper, it too holds out the promise of practical, “world-chang[ing]” results that Koper promises for e-learning research. A fairly obvious example of this type of research and of its possible results is provided by the issue of the digital divide, both within wealthy and technologically advanced countries as well as in parts of the world that are less privileged. The accessibility, effective-

ness, and efficiency of e-learning programs and technologies can, of course, be closely tied to the digital divide issue. And such a divide needs to be dealt with not only as a technical problem, but also as one that is sociopolitical and economic in nature. Consequently, it is a major issue for learning that can be addressed as much through research contributing to advocacy and policy change as through technological improvements or adaptations.

As a corollary to the importance of advocacy and policy in education, e-learning research must also take into account *practice*, specifically the practices of teaching and learning. Practices of these kinds are not always anticipated in the technical design and improvement of ICTs in learning, and do not always occur right at or directly through a technological interface. As the study of the use of new technologies in teaching and learning, e-learning research consequently also needs to focus on what students and teachers are actually *doing* with technology in often complex circumstances and how they may be *adapting* it in unforeseen ways to their own educational practices and priorities. These obvious but complex questions are all too easily overlooked in design and development processes, and, for example, in task-oriented usability tests. At the same time, these questions can be very directly and explicitly addressed in the form of case study research, as is illustrated in chapters two and three of this book. Such studies do not measure the efficiency or effectiveness of a technological intervention or task completion per se. What they *do* investigate is a range of challenges and opportunities afforded through the use of particular Internet technologies in specific educational contexts. Given the rapid and ongoing changes in technologies and practices, this kind of approach has much to contribute to e-learning.

In the context of these dynamics of change, it is possible to argue that an expansion of e-learning research approaches and questions could be quite radical. Consider the question of the nature of learning and education itself. Basic questions related to education—such as student experience, teaching processes and practices, and even processes of thought and expression—are affected and reconfigured under the technical and social conditions and circumstances associated with the use of ICTs in teaching and learning. One example of these kinds of basic questions is that of common student experiences such as

communication and interaction. These come to have meanings on the Web and in technological settings that are quite different from the significance that they might have in the “traditional” classroom. Although students are said to interact, discuss, and chat in both settings, the actual experience of, say, a threaded discussion forum can be quite different from a seminar meeting: one unfolds through written expression over days or weeks, and the other occurs through the spoken word over minutes or hours. The redefinition of seminar or classroom experiences in terms of interactive and even artificially intelligent Web technologies is examined in the second and third parts of this book. This explication and investigation shows that the educational significance of basic pedagogical experiences and processes is hardly self-evident and that research can benefit from a re-evaluation of some of the most fundamental terms constitutive of learning, education, and student experience.

The second problem in e-learning research as a technology-oriented activity is presented by previous research undertaken by its disciplinary precursors, educational technology and distance education. For decades, research studies in these fields have attempted to utilize natural-scientific and technical means of both effecting and measuring improvements in techniques and technologies. According to some (e.g., Schulmeister, 1997), this emphasis on the measurement of improvements has dominated research in these established fields. At the same time, this kind of research and development has not produced the results that were expected. It has not led to a coherent, progressive set of findings and insights that have been associated with gradual increases in student learning, performance, and educational productivity. Instead, studies of these kinds—seeking to measure the effect of the introduction of a new media or other technological innovation in education—have been associated with what is called the no significant difference phenomenon. The phrase refers to the innumerable quasi-experimental “media comparison” studies that show the introduction of a new medium or technology in education as producing only statistically insignificant differences in student outcomes. These studies have shown, in other words, that technology-based courses, when compared to those taught in the classroom, do not

result in a statistically significant difference in student performance or educational efficiency. From print-based correspondence to courses taught via radio, television, and the Web, the use of new media in each case was *not* found to result in a statistically significant improvement in educational efficiency. When compared with more traditional classroom settings, any differences in student performance attributable to technological innovations tend to fall within acceptable margins of error or statistical insignificance. In a book-length survey of the phenomenon, Russell (1999) examines more than 350 studies conducted over 75 years, all of which consistently arrive at the result of no significant difference. Although this is not a predetermined outcome for all studies of this kind, one can generally expect to conclude (as does a more recent report cited by Russell) that, “no significant differences [are] found in outcomes for students in...two [technologically different] modes of instruction.”

The general response of educational technology and distance education to this disappointing or at least inconclusive finding has been to urge a redoubling of existing efforts and to demand increased scientific rigor and precision. In the conclusion of one report that attempts a rigorous analysis of many such media comparison studies, Lou, Bernard, and Abrami (2006) urge that in the future, such “studies should...strive for [more] rigorous control of...methodological factors, such as instructor equivalence, instructional materials equivalence, and time on task differences” (p. 168). Similarly, Ungerleider and Burns (2002) conclude their own review of this type of research by saying that “[t]here are simply too few studies of sufficiently rigorous design to permit informed policy choices...concerning the use and implementation of ICTs” (p. 17). Still others have advocated more radical solutions: characterizing educational technology in particular as being largely “pseudoscientific” in nature, Reeves (1995) has argued for a “moratorium” on “efforts to find out how instructional technology can effect learning through empirical research.” While this book supports the views of scholars like Reeves that past and current circumstances of e-learning research could be better, it advocates not a halt, but

rather an expansion of research frameworks and approaches in e-learning.

E-learning Research as a Multivocal Enterprise

The expansion and inclusion of different approaches, understandings, or voices that this book advocates and demonstrates is interdisciplinary and multidisciplinary in character. It is *interdisciplinary* in that it seeks to combine and explore the *interconnections* between new and different approaches from different fields and specializations; it is *multidisciplinary* in that it simultaneously tries to respect the *multiplicity* of differences that can separate one research approach from another. One programmatic characterization of e-learning research that will serve as a kind of working definition for this book emphasizes both of these aspects of e-learning research:

As a research area, e-learning is both multi- and inter-disciplinary, covers a vast range of research topics, from those that focus on technologies through to wider socio-cultural research questions...[as these extend] across pedagogical, technical and organisational boundaries. (Conole & Oliver, 2007, pp. 3,5)

This basic definition, provided in an edited collection entitled *Contemporary Perspectives in E-Learning Research*, highlights a number of elements central in re-thinking e-learning research. First, it identifies e-learning as interdisciplinary, not simply in the sense of linking educational efficiencies with technological ones, but in a much deeper and expansive sense: one that extends well beyond technology to encompass not only psychology and technical and instructional design but, as the authors add, also to wider “socio-cultural research questions,” and matters of “professional roles and identities, organizational structures and associated strategy and policy” (Conole & Oliver, 2007, p. 3). This interdisciplinarity also goes far beyond any attempt to combine or meld a number of disciplines into a single, consistent, and unitary purpose. Instead, e-learning research, as Conole and Oliver define it, encompasses a multiplicity of “separate voices, each with its own potentially productive tale to tell...” (p. 5). This re-

thinking of e-learning research, in other words, is not about the construction of a single, “authoritative” perspective, account, or knowledge form. It is instead about the combination of many different and not always consistent “voices” and points of view that represent a range of disciplinary and methodological possibilities.

In addition to being designated “multivocal,” the type of research that is explored in this book could just as easily be called “multipistemological,” referring to a plurality of “method[s] or grounds of knowledge” (OED, 2007). There are many ways of conceptualizing the multiplicity or plurality of knowledge forms, but one that is widely referenced and also central to this book is outlined below (Table 1.1). It describes both human knowledge and human interests as “technical,” “practical,” and “emancipatory,” and is the principle way in which the multivocality of knowledge is understood here. This understanding of knowledge is commonly associated with a theoretical framework and approach to research known as “critical theory,” described in detail in chapter eight. Knowledge is understood in this context as taking the form of instrumental, causal explanation, of practical, linguistic understanding, and of emancipatory, critical reflection.

Table 1.1: Three kinds of human interest and knowledge as identified by critical theorist Jürgen Habermas

Interest	Knowledge	Medium	Science
Technical	Instrumental (causal explanation)	Work	Empirical, analytical, or natural sciences
Practical	Practical (understanding)	Language	Hermeneutic or “interpretive” sciences
Emancipatory	Emancipatory (reflection)	Power	Critical sciences

Source: From Carr and Kemmis (1986, p. 136)

Instrumental knowledge corresponds to human interests and activities that are associated with work, labor or production, and with the natural sciences. This corresponds directly to the type of technology-oriented research and knowledge that Koper (2007) de-

scribes as the proper focus of e-learning research. This type of research, as Koper explains, is directed at the development of “new technological knowledge, methods, and artifacts” for the sake of practical efficiency (p. 356).

Practical knowledge is concerned with the meaning and coordination of everyday activities. It serves to establish “a common identity (or mutual understanding) between persons” in everyday domestic, workplace and social settings (Ingram & Simon-Ingram, 1991, p. xxx). It is the kind of knowledge used in conversing at the water cooler, making dinner arrangements, or discussing the events of one's day. Despite its practical and commonplace character, this kind of knowledge—and the way it is generated and validated—is not simple or one-dimensional. Formally speaking, this type of knowledge is developed and validated through interpretive or hermeneutic methods. Hermeneutics, or the “science of interpretation,” involves a kind of progressive, cyclical inquiry that takes into account both the individualized parts and the contextualized whole. Hermeneutic knowledge of this kind has proven to be invaluable to branches of psychology and sociology focusing on the complexity and unpredictability of both human interactions and institutional change. Given the importance of interactions and institutions to education and learning, this kind of practical knowledge should also be indispensable in re-thinking e-learning research. This kind of practical knowledge, therefore, plays a correspondingly central role in this book. It is especially important for the second chapter of this book, which introduces the methodology of hermeneutics in the context of narrative forms and accounts. It also plays a central role in the sixth and seventh chapters, which introduce and apply hermeneutic or interpretive phenomenology to the study of student experiences of technology, specifically in the context of mathematics education.

The third knowledge form and corresponding human interest is *emancipatory*. This type of knowledge is articulated in terms of politics, ideology, and the dynamics of social power. Epistemological validity in this context is not understood as something unchanging and certain, but rather, as the expression of a struggle between contradictory interests, influences, and social groups. This type of

knowledge is central to the final two chapters of the book, which look at the political or ideological character of some of the basic “truths” or presuppositions of e-learning and its institutional, post-Cold War history.

This way of understanding epistemological multiplicity, it should be noted, does not ascribe any kind of special or exclusive status to one knowledge form; all three forms of knowledge and corresponding human interests are seen as being equally important. Also, this multiplicity of knowledge and methods does not imply, as is sometimes said, that simply “anything goes”: it does not mean that any finding or account is as valid as the next. As the different chapters and sections of this book demonstrate, each method brings with it different potentialities, strengths, and limitations. Each also brings with it particular ways of judging and validating the knowledge it produces.

Outline of the Book

As indicated earlier, the chapters and various methodological orientations presented in this book are organized into four principal sections or parts. The first of these deals with methods, frameworks, and understandings related to questions of *culture* in e-learning. Like any human activity, e-learning possesses important cultural dimensions and these are explored in terms of the specific cultural categories of *narrative* and *genre*. Referring to the work of psychologist Jerome Bruner, the first chapter in this section introduces *narrative* as an epistemology or way of knowing that provides a valuable set of alternatives to more “logical” and scientific epistemologies. This chapter presents narrative inquiry as a research method by focusing on the case of an instructor’s narrative account of the introduction of blogging into a writing class. Through its use of techniques of interviewing and interpretation, this chapter illustrates the potential of narrative epistemology and narrative case study research for e-learning.

The next chapter does something similar by operationalizing the cultural category of *genre*. Referring to “kind,” “sort,” or “style,” genre can provide a useful means of understanding the various elec-

tronic forms, formats, and conventions that have proliferated and become commonplace on the Internet and in e-learning. This third chapter illustrates how it is possible to undertake a kind of “genre analysis” in e-learning by examining the form and style of online discussions. It combines this examination with a content analysis of an online discussion transcript. The results of this inquiry show how formal or generic continuity—rather than processes of “critical discourse” or “communal inquiry”—can serve as a basis for understanding how students orient themselves in online discussion forums.

The second section (constituting chapters four and five) focuses on the role of psychology in e-learning research and practice. Chapter four differs slightly from those that precede it in that it does not introduce and apply a particular method to a given e-learning context or technology. Instead, it undertakes a historical examination of the role of technological innovations as metaphors for mind and learning, and investigates the connection of these metaphors to ways of doing research in e-learning. Computer and networked technology are shown to play two different roles in this research: as metaphors or models for understanding human thought and learning, and also as vital means of supporting these processes. These two roles are argued to have a circular or self-referential relationship that renders them problematic. The role of ICTs as defining both the challenges and the solutions associated with e-learning research represents a kind of epistemological and practical conflict of interest. “[H]aving conceived of thinking as a kind of machinery,” as Andrew Feenberg (2002) puts it, “machinery in fact turns out to be the perfect image of the process of thought” (p. 97).

This argument serves as the basis for the introduction and application of an alternative psychological methodology in chapter five. This alternative is sometimes characterized in computer design and psychology communities as coming *after* cognitivist psychology. It is seen as being part of a “*post-cognitivist* turn” that breaks with understandings of the mind as a knowledge-representation and information-processing device. This alternative psychology focuses on the recording and rigorous analysis of everyday conversation and discourse and is therefore also often referred to as “discursive psychology.” “Discourse” in this sense takes the place of cognitive processes

as psychology's central focus. Discourse or "talk-in-interaction" is seen as the means through which people construct their social and psychological worlds, "produc[ing] versions of reality and of cognition...in the course of their [everyday] practices" (Potter, 2001, p. 35). This chapter looks specifically at the way that these versions of reality and of cognition are produced in examples of "chatbot" conversations—text-based interactions with "artificial" interlocutors or agents. Through this analysis, this chapter shows how discursive-psychological methods and heuristics can be applied to interactions both between humans and between humans and computers.

The third section of the book focuses on another methodology—hermeneutic phenomenology—by first devoting a chapter (chapter six) to the introduction of its philosophical and theoretical underpinnings. The "phenomenon" that hermeneutic phenomenology takes as its principal subject matter is nothing less than lived human experience and its meanings. This chapter shows how certain traditions of hermeneutic-phenomenological research allow for the development of rich and unconventional ways of understanding and investigating the "lived experience" of human interaction with complex interfaces and computer technologies. The vocabulary through which these understandings and investigations are articulated, involving terms and concepts such as "handiness," "invisibility," and "breakdown," is derived from studies and descriptions of experience itself, rather than from the language of technical organization and operation. Along with these terms and concepts, chapter six describes different methods for drawing out experiential data from interviewees and research participants. It also shows how to develop these data in the form of self-contained quasi-fictional accounts and how to interpret these accounts through techniques of reflective writing. In doing so, this chapter provides a number of examples of such descriptive experiential accounts and it discusses how they are illustrative of various principles of hermeneutic phenomenology, both as a philosophy and a methodology.

This study of lived experience is taken a step further in chapter seven, which presents a hermeneutic-phenomenological study of children's experiences of a particular puzzle or "manipulative" used in mathematics education. This is the "Tower of Hanoi" puzzle,

which is well-known in computer science and in psychological studies of problem-solving performance. The chapter shows how the experience of engaging with this puzzle can be both highly engaging and emotionally charged. As such, the experience of working with the puzzle appears to be only indirectly related to the process of leading the student from concrete involvement to disembodied mathematical abstraction (as it is described in cognitivist research in development and mathematics learning). Instead, the experiential characteristics associated with this puzzle are remarkably similar to those described and celebrated by mathematicians as constitutive of what is at the “core” of mathematical experience and discovery. This study concludes by making the case that the unexpected, experiential meaning and value of this puzzle has ramifications for understanding student experience generally: that the vicissitudes of this experience can be obscured rather than illuminated through preconceived administrative and technological categories and abstractions. The chapter also presents the argument that important aspects of technological and educational experience overall can be brought to light by using tools and methods that are descriptive, simulative, and even countertheoretical in nature.

The fourth section of the book focuses on the study of politics and history in e-learning. Even though the field of e-learning research and practice is relatively new and closely associated with technology, it has its own distinct political and developmental history. Chapter eight looks at the politics of e-learning by first explaining and then deploying some of the methods associated with *critical theory*. It takes up again the question of multiple knowledge forms and human interests and focuses specifically on emancipatory and critical interests as knowledge. One methodology that is especially important to this emancipatory knowledge is “immanent” or “ideology” critique, which seeks to show how competing and conflicting knowledge claims underlie the most final or authoritative “truths” in a given subject area. The chapter applies the method of ideology critique to a number of commonplace claims in e-learning discourse. These include the claim that technology represents a kind of prime mover or “destiny” that single-handedly “impacts” society, culture, and education. In this way, chapter eight shows that technological forms and

uses can be viewed as a “scene of struggle,” rather than as a fait accompli for e-learning. The chapter also makes the more general case that knowledge generally—whether it pertains to e-learning technologies or any other subject—is always something that has multiple interests and is therefore prone to contradiction and conflict.

Chapter nine develops this general ideological frame of reference further by looking at how historical and political interests have been encoded in e-learning research and development over the past decade or more. This chapter employs two particular methods of ideological and historical analysis, one emphasizing linguistic devices and the second, the design and appropriation of technologies. The first of these methods is a kind of “discursive analysis” that focuses specifically on metaphor and other aspects of language. It examines the ways in which a particular official or specialized discourse is used to construct a particular, political, ideological world. The chapter examines a particular discourse within which the development of monolithic technological solutions to complex human problems—such as ideological struggle or education itself—is made to appear unavoidable. The second method of analysis examines technological artifacts and their design in terms of what is described as their “technical code.” This refers to the way in which political values or ideologies are “encoded” into the design of technical devices. An examination of the technical codes of the Internet and other technologies shows that these technologies bring with them significant evidence of their origins in the U.S. military-industrial complex. Chapter nine uses these two methods of analysis to show how the codes and priorities reflective of the U.S. military-industrial complex (as they relate to American empire or imperialism) can be traced to certain conceptions of e-learning. This chapter also argues that the codes and patterns evident in e-learning technology designs are not unchangeable and that they can be re-coded to be expressive of other values and priorities.

The concluding chapter picks up where this introduction leaves off: it gives additional consideration to research in e-learning as a multivocal enterprise, and contrasts this to recent attempts to define research and practice in this field in terms of a single, unified “natural” science of learning. Drawing from arguments presented throughout the book, the conclusion shows how understandings of the

“learning sciences” can lead to a repetition of the problematic findings and patterns of past research. The final chapter argues for a reconceptualization of e-learning as an inter- and cross-disciplinary endeavor – one that simultaneously offers multiple approaches to a field that is itself rife with possibility.