Designing for Virtual Communities in the Service of Learning

While many of us are concerned with the loss of communal spaces and ties that broaden one's sense of self beyond the "me" or "I" and into the "we" and "us," less clear are the educational advantages of a community approach in terms of learning curricular content. We know even less about whether something resembling community can be designed and about how to measure whether it has emerged. The authors of the chapters in this volume explore the theoretical, design, learning, and methodological questions with respect to designing for and researching Web-based communities to support learning. Coming from diverse academic backgrounds (computer science, information science, instructional systems technology, educational psychology, sociology, and anthropology), they are frank in examining what we do and do not know about the processes and practices of designing communities to support learning. Taken as a collection, these writings point to the challenges and complex tensions that emerge when designing for a Web-supported community, especially when the focal practice of the community is learning.

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LEARNING IN DOING: Social, Cognitive, and Computational Perspectives

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Series Foreword

This series for Cambridge University Press is becoming widely known as an international forum for studies of situated learning and cognition.

Innovative contributions are being made by anthropology; by cognitive, developmental, and cultural psychology; by computer science; by education; and by social theory. These contributions are providing the basis for new ways of understanding the social, historical, and contextual nature of learning, thinking, and practice that emerges from human activity. The empirical settings of these research inquiries range from the classroom to the workplace, to the high-technology office, and to learning in the streets and in other communities of practice.

The situated nature of learning and remembering through activity is a central fact. It may appear obvious that human minds develop in social situations and extend their spheres of activity and communicative competencies. But cognitive theories of knowledge representation and learning alone have not provided sufficient insight into these relationships.

This series was born of the conviction that new and exciting interdisciplinary syntheses are underway as scholars and practitioners from diverse fields seek to develop theory and empirical investigations adequate for characterizing the complex relations of social and mental life and for understanding successful learning wherever it occurs. The series invites contributions that advance our understanding of these seminal issues.

Roy Pea
Christian Heath
Lucy A. Suchman

Foreword

These are early days in the exploration of how *the concept of community* – challenging enough in its own right for inquiries in social science, politics, and education – is to be understood in the emerging hybrid worlds in which people live. These worlds are not simply governed through face-to-face communication. Conversations and relationships are, for a growing number of people, mediated through new tools enabled by computing and telecommunications. These are exciting times, akin to the first decades of the written word and the discourse that might have ensued around what it meant to have the new "virtual talk" that texts created. An examination of Socrates' dialogues in Plato's *Phaedrus* may provide some insight into what such discourse might have been like as Socrates questions the wisdom of writing and books. In these dialogues, Socrates outlines the myth of how the ancient god Theuth gave writing to Thamus, the king of Egypt, and although Theuth advocates that his discovery of writing "provides a recipe for memory and wisdom" that ought to be imparted to other Egyptians, Thamus challenges the gift:

> If men learn this, it will implant forgetfulness in their souls; they will cease to exercise memory because they rely on that which is written, calling things to remembrance no longer from within themselves, but by means of external marks. What you have discovered is a recipe not for memory, but for reminder. And it is no true wisdom that you offer your disciples, but only its semblance, for by telling them of many things without teaching them you will make them seem to know much, while for the most part they know nothing, and as men filled, not with wisdom, but with the conceit of wisdom, they will be a burden to their fellows (Plato, *Phaedrus*, 274c–75b, trans. Hackforth).

The editors have assembled a number of the most active researchers in the field of "virtual communities" for learning, and, to varying degrees, the authors take on the voice of Theuth, Thamus, or the dialectic between them as they challenge us to consider what the designs and implementations

of virtual learning communities are accomplishing and how we might learn to more successfully contribute to learning with our design features and processes for online communities. To this end, many of the authors ask: What is a community? What makes a community? And once we move online in our activities: What is a virtual community? What does it mean to "design" a community, whether real or virtual? What is special about designing virtual communities in the service of learning rather than for other purposes? How do virtual learning communities relate to place-based "communities of learning"? And how can systematic methods of investigation of online community participation contribute not only to scientific understanding of human behaviors in such systems but to new design cycles that improve the fit between community member needs and system properties?

Many, but not all, of the chapters investigate issues affiliated with K–12 education–related communities of learning that are conducted to a significant degree online. We learn about several different environments developed to support online community engagement among pre-service and in-service mathematics and science teachers, about a campus of virtual places used by teaching professionals throughout the K–12 continuum and those who support their learning, about a community forum for mathematics educators at all levels, and about several online communities established to foster learning for schoolchildren. In the realm beyond K–12, there are accounts also of several scholarly learning networks, in technology and in linguistics, and of workplace communities. There are rich profiles of developing methods for studying virtual learning communities, including social network analysis and computer-mediated discourse analysis. Throughout the book, we learn about the struggles, dilemmas, cautions, and dualities that surface in designing for virtual communities. Although often optimistic in tone, these works do not promote online community as a panacea for learning. They deepen our appreciation for the subtle and intricate nature of motives, trust, and identity displayed in social engagements.

I would caution the reader not to be too swept up in a quest to find "the right" definition for learning community, virtual community, or community more generally. I am fond of telling my students that definitions, like maps, are developed for a purpose, and that they become useful to the extent that they enable wayfinding for those who are using them. The philosopher Ludwig Wittgenstein pushed us far in thinking about definitions when he argued that the meaning of the concept "game" is not one governed so simply as by an Aristotelian definition of necessary and sufficient conditions for category membership. He makes the case that concepts are organized in mental and social life by prototypic exemplars, a view rediscovered and developed in cognitive science during the 1970s as Eleanor Rosch and colleagues at Berkeley demonstrated prototype effects in experimental studies of categorization, including "typicality," a finding that

people reliably judge certain exemplars as more representative of a concept than others.

My sense from reading the contributions to this volume is that there is an emerging vision here of prototypic exemplars of virtual communities designed in the service of learning. This book chronicles an initial cartography for the terrain in which investigations of virtual learning community are taking place, and it launches a wayfinding process for those seeking to identify the key issues for learning in online communities as they exist or as they are being designed. The fascinating exercise for readers will be to find their own ways through the territory the authors have begun to map and to bring their own discoveries back to the quest for understanding and exploring the future of learning served by virtual community tools and systems.

Finally, I wish to acknowledge my grief and sadness at the loss of such a valuable colleague and friend as co-editor Rob Kling, whose clarion voice representing the importance of constant consideration of values of social justice, fairness, and community in the face of technology-centered design has inspired so many of us.

Roy Pea
Stanford University
June 16, 2003

Preface and Acknowledgments

This volume brings together a series of chapters focused on the theoretical, design, learning, and methodological questions with respect to designing for and researching virtual communities to support learning. We are at an interesting time in education and technology, with terms such as *communities of learners*, *discourse communities*, *learning communities*, *knowledge-building communities*, *school communities*, and *communities of practice* being the zeitgeists of education and the Internet serving as a much touted medium to support their emergence. More generally, any time a new technology is introduced, it suggests the promise of the revolution of education. Thomas Edison was convinced that film would transform education and make the teacher obsolete. Although the Internet offers much promise and the potential to support new environments for learning, we are just beginning to understand the educational potential of community models for learning and whether community can be designed online or face-to-face. In fact, we know very little about whether something such as community can be designed and, if so, whether this can be done online. We are witnessing instructional designers employing *usability* strategies effective for understanding human-computer interactions, but we have little appreciation of how to design to facilitate sociability – that is, supporting human–human interactions as mediated by technology.

The authors of this edited volume came together to advance a critical and in-depth look at what we *do* and *do not* know about the process and practices of designing for virtual communities in the service of learning. Some of the core questions taken up by the authors include: What constitutes community? How do these electronic environments relate to more familiar place-based pedagogical ones? How well do the techniques and constructs that are used to understand the processes of learning and enculturation in traditional face-to-face community settings suffice for these new settings? What is the educational value of a community approach to

learning? How do we capture and what are the relations among individual, group, and community trajectories?

Our collaborative pursuit of these questions began with the planning and coordination of two symposia for the annual meeting of the American Educational Research Association, at which eleven of the authors presented. To expand the dialogue and broaden our understanding, we asked the participation of other authors from multiple disciplines who are interested also in community and design questions. With support from an NSF CAREER grant and the NSF-funded Center for Innovative Learning Technologies (CILT), we organized two face-to-face author meetings and hosted a Web site with the goals of enhancing communication among authors and producing a more conceptually cohesive book than would otherwise have been possible. As a result, chapter authors read and commented on each other's work, and the group as a whole grappled with a range of common concerns, such as the meaning of "virtual," "designing community" versus "designing *for* community," and the goal of designing "in the service of learning."

Throughout this process we strived for much cross-fertilization of ideas, as authors from diverse backgrounds read and reviewed drafts of each other's papers, incorporating their responses into subsequent drafts of their own papers. It was our commitment to develop a volume that had a distinctive intertextuality, thereby distinguishing it from the (relatively) disconnected contributions of many edited volumes. We view this intertextuality as a strength of the book, allowing for a more cohesive yet multilayered look at the diverse theoretical perspectives and empirical cases presented. The book also was not to be simply more theoretical arguments touting the virtues of community or glossing over the complexities of building for them online. Instead, in their own work, all the authors were committed to clarifying their theoretical assumptions at the same time as they exposed the challenges and inherent dualities involved in designing for and researching virtual communities.

Taken as a whole, this volume offers a much needed critical examination and reflection of what is being learned about the educational potential and challenges of designing for virtual communities. The authors are neither evangelical nor pessimistic about this process, and, at the same time, they have worked to avoid hyperbole and unsubstantiated claims. They are academic and rigorous in their research and in the claims they advance, offering a critical gaze about the challenges and potential of virtual communities to support learning. Each author presents his or her struggles and lessons learned in a manner that provides insight into local struggles while also serving as a resource for others doing similar work in other contexts. It is our hope that by sharing our experiences we as participants in a design field can better understand how to develop contexts for learning that will best meet the needs of those who will be learning through them.

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In Memoriam

From AI (Artificial Intelligence) to SI (Social Informatics): Rob Kling's Intellectual Odyssey

In 1971 Rob Kling presented a paper on reasoning by analogy at an international conference on artificial intelligence held in London. He had been a doctoral student with Edward Feigenbaum at Stanford and his early output reflected his formal research training and also suggested a certain kind of career trajectory within computer science. But a mere couple of years later Rob was delivering a paper at the ACM national conference in Georgia titled, "Towards a person-centered computer technology." And again, in 1973, he published "Notes on the social impacts of AI." The scene was set.

I don't know exactly when Rob's Paul of Tarsus moment occurred, but it is safe to say that his interest in the social dimensions of computing, a set of concerns he was to corral years later with the rubric *social informatics*, dates from the early 1970s. Even a cursory look at the titles of some of the publications included in his curriculum vitae conveys a sense of his evolving intellectual concerns: "Computing as social action," "Computers and social power," "Computer based social movements," "The social design of worklife with computers and networks," "Computing for our future in a social world." For thirty years, until his untimely death, Rob Kling had been doing what some of us were only beginning to think about doing decades later. In fairness, a discerning group of colleagues and scholars recognized the significance of his work early on; others, a growing band of fellow travelers, only came to appreciate his manifold contributions relatively late in his life. But I am already getting ahead of myself.

This appreciation of Rob Kling is being written at very short notice and under the Damoclean sword of a publisher's deadline. That said, I am most grateful to Sasha Barab for the invitation to append a few words to the present volume. After all, Rob was/is his co-editor: it is nothing less than fitting. My only regret is that I shall necessarily fail to capture the many rich (a favorite Klingian epithet) and highly nuanced insights the Great Man

generated in the course of his remarkably productive life. More to the point, I am not especially well qualified to write on the significance of Rob Kling's empirical and theoretical contributions to the nascent domain of social informatics. There are many others who knew him and his work much better than I; collaborators and friends, who could do him justice in print. Ken Kramer and Mark Poster of the University of California-Irvine spring to mind, as do other former members of the "Irvine school" such as John King, now at the University of Michigan, and Suzanne Iacono, currently a program director at the National Science Foundation. My short reflection does not really conform to any established genre of academic writing. It is certainly not a detailed critical assessment of his life's work – that is for another day and another hand – better still, a platoon of knowing hands. It is part an *in memoriam*, part a personal reminiscence. The *Festschriften* will follow in good time.

I first met Rob Kling in 1995, shortly before he uprooted from the West Coast to come, to many people's surprise, not least my own, to the corn-fields of Indiana. But let me here quote verbatim the comments I made immediately after his death. They are still fresh and reflect accurately my enduring sense of, and personal feelings for, the man.

Recruiting Rob Kling was like reeling in a prize marlin: a wrenching struggle, but also a massively gratifying experience. Not that he was rapacious; Rob actually took a salary drop coming to IU from UC Irvine. That spoke volumes. Our negotiations were protracted, but we got to know one another well as draft letters of offer winged their way westward and back. He played according to the Queensbury rules. Rob Kling's accomplishments are legion, and well documented. They don't require retelling here.

He was quite simply the brightest bloke with whom I have had the pleasure of working. Infectiously curious, playfully serious, razor sharp, generous of spirit, and wonderfully open-minded. Which isn't to say that we always saw eye-to-eye; over the years we had a couple of serious spats; on both occasions he ate humble pie in a way that only a special kind of colleague could have. He probably didn't need to, but he did. That, too, spoke volumes. We regularly read and commented on one another's drafts. And we chatted a lot, to the point that we could complete one another's sentences. He'd laugh, the upper body juddering, a cross between sometime UK Prime Minister Edward Heath and a pneumatic drill. I can see him vividly as I write; eyes sparkling, mischief never a million miles away.

Rob cared about the academy, and was passionately committed to maintaining scholastic standards and collegiality. He juggled a workload that made the rest of us blanch. Yet, as soon as a new problem, challenge, or opportunity presented itself, he was off. Another ball was tossed up into the already seriously congested air. I'd routinely tease him that he had more bees in his bonnet than an apiarist, but the man was not for turning. Such was Rob, and we would not have had it otherwise. He added so much to the life of our school and IU in a relatively short time. He enthused and inspired us all, young and old, seasoned and wet behind the ears. I cannot bear to think that the Big Man's face will never again peer around my door.

Those of us who have had the pleasure of working with Rob Kling know just how fortunate we are.

These comments were posted along with many others on the School of Library and Information Science's Web site. I revisited these touching tributes and was struck by the profound effect Rob had on the lives of so many people in so many vectors of academic life. I thought I had a good sense of the man after seven years as his colleague, but in the days and weeks following his death I discovered so much more about him simply by listening to, and reading, what others had to say. Rob was indefatigable and extraordinarily generous in terms of his willingness to engage with, advise, and mentor all and sundry. He would as happily debate or work with a graduate student as a distinguished coeval peer. That says a lot. He didn't just understand the social aspects of computing, but recognized the social aspects of thinking and writing about the social dimensions of computing. In fact, Rob exemplified classic Mertonian norms, such as communism and disinterestedness, to say nothing of organized skepticism. He was an exemplary scholar, for whom the values of the academy (collegiality, faculty governance, peer review) mattered greatly. And, as he confessed to me not so long before he passed away, he still got nervous before teaching his class, a sure sign of an individual who took his pedagogic responsibilities seriously. Rob's intellectual vibrancy was matched by his passion for disciplined enquiry. He was the perfect "trusted assessor," a colleague who always managed to ask a penetrating question, reframe an argument, or critique a draft manuscript in a way that simply didn't occur to most of us.

He did not accept things at face value (such as the presumed benefits or limitations of online learning), was wary of punditry (he would challenge utopian and dystopian IT futures with equal relish), and was deeply suspicious of one-size-fits-all solutions (the electronic publishing regimes that work for high-energy physicists won't work for everyone else, he stressed often in his later publications). Kling understood that choices relating to the adoption and use of ICTs (information and communication technologies) were not apolitical; he understood the role of power in organizations and work groups. Through fieldwork and empirical studies he deftly explored the soft underbelly (or "underside," to use his term) of ICTs in organizations of all kinds, trying to understand the interaction (a key construct in his *oeuvre*) of human behaviors and information technology. The compendious (961 pages to be exact) second edition of his edited volume, *Computerization and Controversy: Value Conflicts and Social Choices* (Academic Press, 1996), particularly the introductory and linking sessions written by him, give a good idea of what motivated Rob Kling. We need to move beyond analysis of technology "effects" and "impacts" to an understanding of the mutual shaping of technology and human behavior. He was not the only one to think thusly, but he was certainly one of the most vocal cheerleaders in

the sociotechnical systems camp. But let me here defer to his words: "I believe that understanding the social repercussions of any technological system requires that we be able to see it from the perspectives of the people who are likely to use it and live with it, or even, in part, live within it. It takes some empathy to appreciate their perceptions; it takes courage to unflinchingly acknowledge the pains as well as the pleasures that new technologies bring to people's lives" (p. 9). Rob Kling was no saint, but he was a humane man with a well-developed social conscience and a sterling sense of professional propriety.

In an elegantly written and well-informed obituary in the *Los Angeles Times* (May 26, 2003, B11), Myrna Oliver, a staff writer, remarked that Kling often used automotive analogies to explain social informatics: "Technological debates could be likened to discussing the latest sports car model . . . while informatics addresses how the automobile has affected society, including construction of highways and developments of suburbs." Not altogether surprising, then, that he should have co-edited with Spencer Olin and Mark Poster the award-winning *Postsuburban California: The Transformation of Postwar Orange County* (University of California Press, 1991). This was just another example of his fecundity and breadth of scholarly interests. In his research, publications, and presentations Rob would frequently use telling metaphors and analogies to vivify abstractions (think "web of computing"). It was the same on the administrative plane. Invariably, he would illuminate the dullest of procedural discussions with an eye-opening or dissension-resolving observation.

When Rob came to Indiana University it was on the understanding that he would establish the Center for Social Informatics (CSI) and also act as editor-in-chief of *The Information Society*, a journal he improved greatly during his time at the helm. The CSI's mission statement (http://www.slis.indiana.edu/CSI/mission.html) notes that the Center is dedicated to supporting research into IT and social change. In his words, "[s]ocial Informatics (SI) refers to the body of research and study that examines the social aspects of computerization – including the roles of information technology in social and organizational change, the uses of information technology in social contexts, and ways that the social organization of information technologies is influenced by social forces and social practices." Rob's Center acted as a campus agora for debate on the social aspects of computing. Fellows of the Center were drawn from a range of academic units, including business, instructional systems technology, political science, informatics, library and information science, telecommunications, and journalism. It was a testimony to Rob's sapient leadership that he could seed interest so broadly.

Social informatics is a rather protean notion, one that has still not achieved universal acceptance, although the term "informatics" has recently migrated from Europe to the New World: witness the number of

embryonic schools of informatics dotting the academic landscape. Rob may indeed be "the founding father of social informatics," as the *LA Times* stated. Kling's ideas will surely continue to have an impact across fields and disciplines. His scholarly spoors are to be found in many different literatures, for he talked to and influenced quite a few academic tribes in the course of his career. Rob's research has been demonstrably influential in the fields of management, computer science, public administration, and sociology, to name but a few. In short, he wore seven-league boots.

Rob Kling had unquenchable intellectual curiosity and a trencherman's appetite for life. His brain fizzed and his personality sparkled. He was a singularly vivid presence in our lives, and he will live on in his many stimulating and original writings.

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