Games, Learning, and Society

This volume is the first reader on games and learning of its kind. Covering game design, game culture, and games as twenty-first-century pedagogy, it demonstrates the depth and breadth of scholarship on games and learning to date. The contributors represent some of the most influential thinkers, designers, and writers in the emerging field of games and learning – including James Paul Gee, Soren Johnson, Eric Klopfer, Colleen Macklin, Thomas Malaby, Bonnie Nardi, and David Sirlin. Together, their work functions both as an excellent introduction to the field of games and learning and as a powerful argument for the use of games in formal and informal learning environments in a digital age.

Constance Steinkuehler is an assistant professor of educational communications and technology at the University of Wisconsin-Madison. She is currently on leave to serve as a senior policy analyst in the Office of Science and Technology Policy in the Executive Office of the President to advise on national initiatives related to games and learning.

Kurt Squire is an associate professor of educational communications and technology at the University of Wisconsin-Madison. He is the director of the Educational Research Integration Area at the Morgridge Institute for Research, a design and research lab that makes scientific discovery visible through the development of games and simulations for public understanding.

Sasha Barab is a professor in the Teachers College at Arizona State University, where he also holds the Pinnacle West Presidential Chair and is a founding senior scientist and scholar of the Learning Sciences Institute.

LEARNING IN DOING: SOCIAL, COGNITIVE, AND
COMPUTATIONAL PERSPECTIVES

SERIES EDITOR EMERITUS
John Seely Brown, *Xerox Palo Alto Research Center*

GENERAL EDITORS
Roy Pea, *Professor of Education and the Learning Sciences and Director,
Stanford Center for Innovations in Learning, Stanford University*

Christian Heath, *The Management Centre, King's College, London*

Lucy A. Suchman, *Centre for Science Studies and Department of Sociology,
Lancaster University, UK*

BOOKS IN THE SERIES
The Construction Zone: Working for Cognitive Change in School
Denis Newman, Peg Griffin, and Michael Cole

Situated Learning: Legitimate Peripheral Participation
Jean Lave and Etienne Wenger

Street Mathematics and School Mathematics
Terezinha Nunes, David William Carraher, and Analucia Dias
Schliemann

Understanding Practice: Perspectives on Activity and Context
Seth Chaiklin and Jean Lave, Editors

Distributed Cognitions: Psychological and Educational Considerations
Gavriel Salomon, Editor

The Computer as Medium
Peter Bøgh Anderson, Berit Holmqvist, and Jens F. Jensen, Editors

Sociocultural Studies of Mind
James V. Wertsch, Pablo del Rio, and Amelia Alvarez, Editors

Sociocultural Psychology: Theory and Practice of Doing and Knowing
Laura Martin, Katherine Nelson, and Ethel Tobach, Editors

Mind and Social Practice: Selected Writings of Sylvia Scribner
Ethel Tobach et al., Editors

Computation and Human Experience
Philip E. Agre

(Continued after index)

Games, Learning, and Society

Learning and Meaning in the Digital Age

Edited by

CONSTANCE STEINKUEHLER
University of Wisconsin-Madison

KURT SQUIRE
University of Wisconsin-Madison

SASHA BARAB
Arizona State University

CAMBRIDGE
UNIVERSITY PRESS

Contents

Contents   ix

Contributors

Sasha Barab
Arizona State University

Rebecca W. Black
University of California, Irvine

Trina Choontanom
University of California, Irvine

Sarah Chu
University of Wisconsin-Madison

Douglas B. Clark
Vanderbilt University

Bob Coulter
Litzsinger Road Ecology Center

Drew Davidson
Carnegie Mellon University

James Paul Gee
Arizona State University

Melissa Gresalfi
Indiana University

Erica Rosenfeld Halverson
University of Wisconsin-Madison

Elisabeth Hayes
Arizona State University

Soren Johnson
EA2D

Yasmin B. Kafai
University of Pennsylvania

Eric Klopfer
MIT Scheller Teacher Education Program

Richard Lemarchand
Naughty Dog

Greg LoPiccolo
Harmonix Music Systems, Inc.

Colleen Macklin
Parsons The New School for Design

Thomas M. Malaby
University of Wisconsin-Milwaukee

Mario Martinez-Garza
Vanderbilt University

Nathan McKenzie
Independent Game Designer

Bonnie Nardi
University of California, Irvine

Yoonsin Oh
University of Wisconsin-Madison

Kylie A. Peppler
Indiana University

Judy Perry
MIT Scheller Teacher Education Program

Patrick Pettyjohn
Indiana University

Stephanie M. Reich
University of California, Irvine

David Williamson Shaffer
University of Wisconsin-Madison

John Sharp
Savannah College of Art and Design–Atlanta

Contributors xiii

Josh Sheldon
MIT Scheller Teacher Education Program

David Sirlin
Independent Game Designer

Maria Solomou
Indiana University

Kurt Squire
University of Wisconsin-Madison

Constance Steinkuehler
University of Wisconsin-Madison

Series Foreword

This series for Cambridge University Press is 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 sphere 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 borne 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

James Paul Gee

People of all ages spend massive amounts of time watching television. In his book *Cognitive Surplus*, Clay Shirky argues that we could change the world if we could get people to devote many of those hours to important causes. And, indeed, more and more people today are turning off the television and using digital media to produce and not just consume, to participate and not just spectate, and to innovate and not just replicate. Video games are one important medium that has siphoned cognitive energy from television. However, for nongamers, video games are often not what they think they are based on what mainstream media often makes them out to be.

Games are not like books, movies, or television. Books, movies, and television are all about their content. In these media, content is king. Games have content, but they are not about their content. They are about doing, making decisions, solving problems, and interacting. Content is there in a game to facilitate and serve acting, deciding, problem solving, and interaction. In good games, content (including story or plot) needs to be a loyal vassal to *game mechanics*, that is, all that players must do and decide in order to succeed. *War and Peace* is about war and peace; *Grand Theft Auto* is not about crime – it is about players coming up with good strategies for success in a virtual world with multiple constraints, some stemming from the story and many from the design of the virtual world and the game play in it.

People certainly can learn things from books, movies, and television. But learning is, for nearly all good games, a core game mechanic. Gamers do not just do things and make decisions. They must learn things and even master them. If they don't, they don't leave the first level of a game. Imagine a book that constantly had quizzes and tests at the end of each section (oops, that's a textbook). Few people would consider it fun (few people consider textbooks fun). But games constantly assess players. Every action is a test with feedback, and the boss at the end of a level is a "final exam" for

xvii

that level. Games have found that both learning and constant assessments of that learning are a "turn-on" for people. And players pay lots of money for this turn-on. The textbook makers can only marvel in envy.

Good games work because they know that learning is a deep drive for humans, a drive that school has managed to kill for many. Games are simply spaces of learning and problem solving with a "win" condition (beating each level and the game as a whole). But to sell, they have to organize learning in engaging and highly motivating ways. They have to tap into the innate drive for learning and mastery that is inside all human beings.

As learning systems, games are not traditional pedagogy (tell the learner everything through overt instruction) or liberal pedagogy (just turn the learners loose in a rich environment). Games make it feel like the player has been turned loose in a rich environment. But the game mentors, guides, and teaches the player all the time. Games do this by designing experiences in the game world in such a way that they shape players' goals, decisions, and actions while still leaving players a good deal of freedom and responsibility for their own decisions and actions. It is a sort of magic: design as mentor and teacher.

Games honor "tacit knowledge," that is, knowledge about how to act (do things) gained from experience. But they also know that knowledge gets deeper when we can articulate it and think about it overtly. Not all tacit knowledge can be rendered overt, conscious, and articulated. But a good deal can. School tends to rarely honor tacit knowledge. It fails to realize as well that moving from tacit knowledge to explicit knowledge is a route that ensures the ability both to solve problems and store relevant facts and information. Simply teaching and assessing information and facts, as school so often does, gets paper-and-pencil tests passed but does not lead to problem solving.

Games often build into their designs lots of language, exposition, and explanation, so that players can learn some explicit articulated knowledge from game play itself. But very often games rely on interest-driven, fan-based communities associated with the game to accomplish this goal. In these communities (which I have elsewhere called *passionate affinity spaces*), gamers reflect on, critique, and analyze the game, game play, and different strategies. They even use software tools to redesign ("mod") aspects of the game or to design devices (such as damage meters) that can be used in the game by other players, tools that often require a deep understanding of the statistical model underlying a game.

School is about "belief." It is about what others have claimed and what is true or not. Although belief is important, games and game play are about "design knowledge." Design knowledge is not just about belief but

also about which beliefs, facts, and tools are adequate or not for various purposes and goals.

As I have mentioned, games engage in constant assessment. In school, assessments are about "knowledge," about what facts and information and formulas one can articulate or write down. In games, assessment is about knowledge in that sense as well (and you are, in particular, in trouble in a game-based passionate affinity space if you cannot articulate your knowledge). But they also assess three others things: (1) problem solving, (2) the quality of one's choices and decisions across time in terms of their short- and long-term consequences, and (3) preparation for future learning, that is, how well the player is prepared to go to the next harder level, not just what the player has mastered in the level. Games do not want you to pass tests if you can't pass the next one and win in the end.

All in all, good games are a model of twenty-first-century learning. The same principles that games use to "hook" gamers can be used to "hook" learners on anything worthwhile, including school "content" such as science, civics, and math (which, then, must be seen as things to do and not just facts to repeat).

Many have hoped that the cognitive surplus drawn away from television to more interactive and social media will lead to transformation in the real world. It may then seem surprising that gamers use a lot of that cognitive surplus to engage in theory crafting, modding, and designing for games and other virtual environments. They study the underling statistical models in games; they use scientific thinking, and even carry out experiments, to argue about the complex interaction of variables in games; they study the economics of massive multiplayer games so that they can manipulate it; they use digital 3D tools to design all sorts of different things for games (e.g., *the Sims* and *Spore*) – such as houses, environments, creatures, clothes, cities – and virtual worlds such as *Second Life*.

Some worry that all this intellectual effort and all these skills will not "transfer" to the real world. But the reality is that games – which today, for the most part, involve real people collaborating and working and playing socially with each other – are the real world. The models gamers build and the designs they make influence others across the world and sometimes lead to new businesses selling virtual or real goods. The evidence that the cognitive surplus devoted to games transfers to other aspects of the real world is the large number of game players, modders, and designers who have moved on to other technical, artistic, and entrepreneurial enterprises. Games are, without doubt, a great source of a secondary, value-added, enhanced cognitive surplus that spills out into many aspects of the world.

However, in my view, the real contribution games studies – when they involve papers such as the ones in this volume – has to make is to show us that we swim in a new sea of possibilities. We can learn from games and gaming not just new ways to build better games but also ways to build better learning, assessment, production, participation, design, and creativity for all people, old and young, in a fast-changing, high-risk, global world. Levi-Strauss once said that people in oral cultures used myths to show that objects in nature were "good to think with" and not just to eat or use. This discovery was one of the origins of science and theory building. Games are good to think with as well and not just to play. They, too, can be the origins of new ways with learning and knowledge.

Acknowledgments

This book is the culmination of many brilliant people creating the future of new media, unpacking how they operate, and applying how they operate to try and transform education. This community (and book project) reflects the work of game developers, academics, and teachers, many of whom play all three of these roles from time to time. We are indebted to everyone in this community and particularly to James Paul Gee, Henry Jenkins, and Connie Yowell, who have paved the way for this collaboration through building this field. This particular book project, which seeks to engage the learning sciences community in these conversations (where all three of us were trained as scholars) from a situated learning perspective, is also indebted intellectually and practically to John Seely Brown, Jean Lave, Etienne Wenger, Lucy A. Suchman, John Bransford, Roy Pea, and Ann Brown.

As is always the case, our thinking in conceptualizing this work is deeply indebted to our graduate students. We are greatly indebted to Crystle Martin without whose indefatigable conceptual and practical management "up" we would never have been able to finally pull this volume together. Her work has made all of ours better in numerous ways. We would also like to acknowledge Tyler Dodge whose wonderful spirit was engaging, sincere, and deeply committed to using media for social justice. Much of the thinking in Sasha's chapter comes directly from Tyler, who has shaped all our thinking on games. Tyler will be missed by this community, but most profoundly by Sasha, who is deeply grateful for Tyler's selfless willingness to share his contributions so generously.