

Notes

1 Introduction and Overview: The Future of Learning Institutions in a Digital Age

1. Washington Irving, "The Legend of Sleepy Hollow," in *The Sketch Book of Geoffrey Crayon* (New York: C. S. Van Winkle, 1820).

2. "Wikipedia," on Wikipedia, <http://en.wikipedia.org/wiki/Wikipedia:About>.

3. The initial posting of the draft manuscript of this book on the Institute for the Future of the Book's Web site in January 2007 amassed over 350 registrants. It has since changed considerably to take the comments and suggestions of these registrants into consideration. All comments through March 2008 have been taken into consideration in this printed book.

4. An excellent example of an interactive hybrid is the multiple publication sites for the proceedings of our first HASTAC conference (May 2007). *Electronic Tectonics: Thinking at the Interface*, edited by Erin Ennis, Zoë Marie Jones, Paolo Mangiafico, Mark Olson, Jennifer Rhee, Mitali Routh, Jonathan E. Tarr, and Brett Walters, was published under Creative Commons licensing by Lulu, an open-source venture founded by Red Hat CEO Bob Young. The book is available for purchasing as a printed volume or by free digital download. Additionally, a multimedia version is available on the HASTAC Web site (<http://www.hastac.org>),

and edited talks from the conference appear on the HASTAC YouTube channel (<http://www.youtube.com/user/video4hastac>). Finally, the interactive data visualization experiment collaboratively produced for the conference has contributed to the nonprofit research Web site SparkIP (<http://www.sparkip.com>), which also has an online for-profit component. All of these various forms of content creation constitute “publishing” in the digital age.

5. For more information on the history of the book, see Cathy N. Davidson, ed., *Reading in America: Literature and Social History* (Baltimore: Johns Hopkins University Press, 1989).

6. Roland Barthes, *Image-Music-Text* (New York: Hill and Wang, 1978).

7. Mark Granovetter, “The Strength of Weak Ties: A Network Theory Revisited,” *Sociological Theory* 1 (1983): 201–233.

8. Following this success, the MacArthur Foundation funded two subsequent competitions. The second focused on participatory learning; at press time, the third had not yet been defined.

2 Customized and Participatory Learning

1. Anderson, *The Long Tail: Why the Future of Business Is Selling Less of More*. (New York: Hyperion, 2006).

2. Jason Mittell of Middlebury College wittily notes that using the phrase *smash bestseller* for a book about the long tail is a bit of a contradiction (Jason Mittell, comment on “Future of Learning Institutions in a Digital Age,” Institute for the Future of the Book, <http://futureofthebook.org>). This is true: books, in general, are such a niche market that even bestsellers reach only a small segment of the population. Even in the case of *The Long Tail*, there has been relatively little academic or educational use of the book.

3. Erik Brynjolfsson, Yu Jeffrey Hu, and Duncan Simester, “Goodbye Pareto Principle, Hello Long Tail: The Effect of Search Costs on the Concentration of Product Sales” (2007), <http://ssrn.com/abstract=953587>.

4. For more information, see: <http://www.softwaretime.com>.

5. No Child Left Behind Act of 2001, Public Law 107–110, 107th Congress, (January 8, 2002).
6. House Committee on Health, Education, Labor, and Pensions, *NCLB Reauthorization: Modernizing Middle and High Schools for the 21st Century*, 2007. See also Deborah Meier et al., *Many Children Left Behind: How the No Child Left Behind Act Is Damaging Our Children and Our Schools* (Boston: Beacon Press, 2004); Paul E. Peterson and Martin R. West, eds., *No Child Left Behind? The Politics and Practice of School Accountability* (Washington, DC: Brookings Institute Press, 2003).
7. K. G. Schneider and Becky Kinney rightly point out in their comments on the Institute for the Future of the Book that many demographic factors contribute to dropout rates. Kinney notes, however, that, for some dropouts, there are strong preferences for video gaming (sometimes accompanied by recreational drug use) over attending class. Some educators have addressed this issue by experimenting with gaming environments and whole gaming schools for kids, including those deemed at risk for dropping out of school entirely. See Bibliography II in this book for some models for using virtual environments for alternative education in formal educational settings. K. G. Schneider, comment on “Future of Learning Institutions in a Digital Age,” Institute for the Future of the Book, comment posted on February 10, 2007, <http://www.futureofthebook.org/HASTAC/learningreport/i-overview>; Becky Kinney, comment on “Future of Learning Institutions in a Digital Age,” Institute for the Future of the Book, comment posted on February 19, 2007, <http://www.futureofthebook.org/HASTAC/learningreport/i-overview>.
8. Some of the most dedicated researchers of social networking sites like Facebook and MySpace are adamantly opposed to using these sites for formal education. In a debate in *The Economist*, danah boyd protests, “I have yet to hear a compelling argument for why social network sites (or networking ones) should be used in the classroom. Those tools are primarily about socializing, with media and information sharing there to prop up the socialization process (much status is gained from knowing about the cool new thing). I haven’t even heard of a good reason why social network site features should be used in the classroom.”

See Wikipedia for a brief history of Facebook and a summary of some of the arguments surrounding it: <http://en.wikipedia.org/wiki/Facebook>.

9. For more information, see: Bibliography II in this book; <http://hastac.ning.com>; <http://www.classroom20.com>; and <http://www.shapingyouth.org>.

10. <http://digitalyouth.ischool.berkeley.edu/user/5>.

11. A more self-conscious hybrid is McKenzie Wark's publication of his new book, *?GAM3R 7H30RY?* (Gamer Theory), on a collaborative software environment sponsored by the Institute for the Future of the Book (<http://www.futureofthebook.org/gametheory>), a project designed to bring readers into the creation of the book (Andrew Richard Albanese, "The Social Life of Books," *Library Journal* [2006]) and offering readers one-click preordering of the next iteration of the book (to be published by Harvard University Press). New projects such as the Wikiversity Learning Project (<http://en.wikiversity.org>) are designed to support collaborative models of knowledge sharing. Excellent discussions of the impact of open-source and Creative Commons licensing on discourse, scholarship, creativity, and media are provided by James Boyle, *The Public Domain: Enclosing the Commons of the Mind* (New Haven, CT: Yale University Press, 2008) and Lawrence Lessig, *Free Culture: The Nature and Future of Creativity* (New York: Penguin, 2005).

12. Alex Reid, comment on "Future of Learning Institutions in a Digital Age," Institute for the Future of the Book, comment posted on March 31, 2007, <http://www.futureofthebook.org/HASTAC/learningreport/i-overview>.

13. For an excellent overview of some of the key issues of open source, see Christopher M. Kelty, *Two Bits: The Cultural Significance of Free Software* (Durham: Duke University Press, 2008).

14. Itzkoff, Dave. "A.P. Says It Owns Image in Obama Poster," *New York Times*, March 11, 2009, <http://artsbeat.blogs.nytimes.com/2009/03/11/associated-press-files-countersuit-over-obama-poster/>.

15. Creative Commons allows knowledge producers to license their published material in a broad spectrum of possibilities between full copyright and the public domain (<http://creativecommons.org>).

16. In 2008, at least two prominent universities, Harvard and the University of California, Berkeley, each made well publicized (if partial) experiments into open-access publishing; MIT joined this movement in 2009. Harvard now requires its faculty to republish any scholarship that appears in a subscription-only journal into an open-access archive supported by the Harvard University Library. Harvard pays publishers a fee to offset potential lost revenue from this republication. Since this only applies to Harvard faculty, it addresses the issue of access but replicates the problem of site-specific (rather than seamlessly interoperable) silos at libraries. The University of California at Berkeley has gone a different route with its experiment, subsidizing its faculty to publish original scholarship in open-access journals. For an analysis of potentials and problems and of the necessity for rethinking the entire publishing cycle as an interrelated continuum (author, publisher, distributor, reader), see “Open Access and Its Costs,” March 13, 2008, <http://www.hastac.org/node/1263>.

17. Henry Jenkins, comment on “Recut, Reframe, Recycle: An Interview with Pat Aufderheide and Peter Jaszi (Part Two),” *The Confessions of an Aca-Fan: The Official Weblog of Henry Jenkins*, comment posted February 8, 2008, http://www.henryjenkins.org/2008/02/recut_reframe_recycle_an_inter.html.

18. Keith Aoki, James Boyle, and Jennifer Jenkins, *Tales from the Public Domain: Bound by Law?* (Durham, NC: Duke University Center for the Study of the Public Domain, 2006).

19. *Eyes on the Prize: America's Civil Rights Years (1954–1965)*, produced by Henry Hampton (Boston: Blackside, 1987).

20. For an analysis, see, for example, Immanuel Wallerstein's *The Uncertainty of Knowledge* (Philadelphia: Temple University Press, 2004).

21. In some modest way, the experiment of “The Future of Learning Institutions in a Digital Age” should be useful to others who are pursuing new forms of writing and new kinds of collaborative projects.

3 Our Digital Age Implications for Learning and Its (Online) Institutions

1. Wheat, comment on “Future of Learning Institutions in a Digital Age,” Institute for the Future of the Book, comment posted on August 6, 2007, <http://www.futureofthebook.org/HASTAC/learningreport/i-overview>.
2. No Child Left Behind Act of 2001, Public Law 107-110, 107th Congress (January 8, 2002).
3. Philomena Essed and David Theo Goldberg, “Cloning Cultures: The Social Injustices of Sameness,” *Ethnic and Racial Studies* 6, no. 1 (2002): 1066–1082.
4. A trenchant analysis of the ways these factors in the lives of youth merge in U.S. national policy and ideology is provided by Lawrence Grossberg, *Caught in the Crossfire: Kids, Politics, and America's Future* (Boulder, CO: Paradigm, 2005).
5. The Education Trust, “Getting Honest about Grad Rates: Too Many States Hide Behind False Data,” June 23, 2005, <http://www2.edtrust.org/EdTrust/Press+Room/HSGradRate2005.htm>.
6. *Cities in Crisis: A Special Analytic Report on High School Graduation*, released April 1, 2008, chaired by Alma J. Powell of America's Promise Alliance and prepared by Editorial Projects in Education Research Center, reveals that “in the metropolitan areas surrounding 35 of the nation's largest cities, graduation rates in urban schools were lower than those in nearby suburban communities. In several instances, the disparity between urban-suburban graduation rates was more than 35 percentage points.” <http://www.americaspromise.org/Our-Work/Drop-out-Prevention/Cities-in-Crisis.aspx>.
7. See the Prison University Project, <http://www.prisonuniversityproject.org/resources.html>, and the Correctional Education Facts from the National Institute for Literacy, <http://www.nifl.gov/nifl/facts/correctional.html>.
8. Human Rights Watch, “U.S.: Prison Rates Hit New High,” (Washington, D.C: Human Rights Watch, 2008), <http://www.hrw.org/english/docs/2008/06/06/usdom19035.htm>.

9. Douglas Thomas and John Seely Brown, "The Play of Imagination: Beyond the Literary Mind," working paper, August 22, 2006, <http://www.johnseelybrown.com/playimagination.pdf>.
10. Although many people use the phrase *Net Age* as shorthand for *Internet Age*, this book uses John Seely Brown's particular use of the term to signal both the Internet and networking, the specific combination that Tim O'Reilly calls *Web 2.0* and that seems a vastly rich model for learning and a specific challenge to most existing forms of learning institutions (Tim O'Reilly, "What is Web. 2.0: Design Patterns and Business Models for the Next Generation of Software" (Cambridge, MA: O'Reilly Media, Inc., 2005), <http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html>).
11. James Boyle, "A Closed Mind about an Open World," *Financial Times* (August 7 2006): 20–24.
12. Since 1994, Alan Liu has been the "weaver," of The Voice of the Shuttle: Web Page for Humanities Research, <http://liu.english.ucsb.edu/the-voice-of-the-shuttle-web-page-for-humanities-research>.
13. Ron Rosenzweig, "Can History Be Open Source? Wikipedia and the Future of the Past," *Journal of American History* 93, no. 1 (2006): 117–146, <http://chnm.gmu.edu/resources/essays/d/42>.
14. "Peopling the Police: A Social Computing Approach to Information Authority in the Age of Web 2.0," Alan Liu, 2008, <http://liu.english.ucsb.edu/peopling-the-police-a-social-computing-approach-to-information-authority-in-the-age-of-web-20-drha-2008/>.
15. Perhaps the best article available on the advantages and the shortcomings of Wikipedia as a collaborative knowledge site and as a reference work is the entry on "Wikipedia" on Wikipedia, <http://en.wikipedia.org/wiki/Wikipedia:About>. See also Cathy N. Davidson, "We Can't Ignore the Influence of Digital Technologies," *Chronicle of Higher Education Review* 53 (2007): B20, <http://chronicle.com/weekly/v53/i29/29b02001.htm>.
16. For an excellent discussion of the value system implicit in open-source culture, see Kelty, *Two Bits*, 2008. On networked individualism and society, see Barry Wellman et al., "The Social Affordances of the

Internet for Networked Individualism," *Journal Of Computer Mediated Communication* 8, 3 (2003). <http://jcmc.indiana.edu/vol8/issue3/wellman.html>.

17. For an extended discussion of how collaborative knowledge making exposes assumptions in what academics call *peer review*, see Cathy N. Davidson, "Humanities 2.0: Promise, Perils, Predictions," *PMLA* 123, no. 3 (2008): 707–717.

18. HASTAC has taken an active role in exploring a variety of electronic publishing forms. In addition to helping to support Kelty's online version of *Two Bits* (as a free download that can be remixed and commented upon) and to publishing the first draft of this book on a collaborative writing site, HASTAC has published the proceedings of its first annual conference with Lulu, a self-publishing site that allows users to purchase a book or to download it for free as well as in a multimedia form. The proceedings of the second conference combine multimedia (audio-video) as well as multiauthored live blogging of talks, exhibits, and events combined as an online archive of the event. Discussions with various academic presses about contemporary electronic publishing initiatives as the future direction of academic publishing are ongoing.

19. MILLEE, <http://www.cs.berkeley.edu/~mattkam/millee>.

20. One implication of this is that the "English Only" movement—whether as administrative vernacular or more pointedly here as medium of instruction—fails dismally to comprehend the hybrid histories of the formation and transformation of the language of English over time.

21. Persuasive Games, <http://www.persuasivegames.com>.

22. AgoraXChange, <http://www.agoraxchange.net>.

23. Virtual Peace, <http://www.virtualpeace.org>.

24. Black Cloud, <http://studio.berkeley.edu/bc>.

25. "Law Professors Rule Laptops Out of Order in Class," <http://chronicle.com/article/Law-Professors-Rule-Laptops/29745>.

26. C. Avery, comment on “Future of Learning Institutions in a Digital Age,” Institute for the Future of the Book, comment posted on March 18, 2007, <http://futureofthebook.org>.

27. Mark Bauerlein, *The Dumbest Generation: How the Digital Age Stupefies Young Americans and Jeopardizes Our Future (or Don't Trust Anyone Under 30)* (New York, NY: Jeremy P. Tarcher/Penguin, 2008); “8 Reasons Why This Is the Dumbest Generation,” *The Boston Globe Online*, <http://www.boston.com/lifestyle/gallery/dumbestgeneration>, accessed July 31, 2009.

28. Elizabeth Gudrais, “Unequal America: Causes and Consequences of the Wide—and Growing—Gap Between Rich and Poor,” *Harvard Magazine* 110, no. 6 (2008): 22–29, <http://harvardmagazine.com/2008/07/unequal-america.html>; Claudia Goldin, *The Race Between Education and Technology* (Cambridge, MA: Belknap Press, 2008); Bill Readings, *The University in Ruins* (Cambridge, MA: Harvard University Press, 1996); Mark Gibson and Alec McHoul, “Interdisciplinarity,” in *A Companion to Cultural Studies*, ed. Toby Miller (Oxford: Basil Blackwell, 2006); David Theo Goldberg, “Enduring Occupations,” *The Threat of Race* (Oxford: Wiley-Blackwell, 2008).

29. This is the title for the keynote address that John Seely Brown delivered at the first international conference of HASTAC, “Electronic Techtonics: Thinking at the Interface,” April 19, 2007, at the Nasher Museum of Art at Duke University. A webcast is available at <http://www.hastac.org>. Some schools, including public schools, are just coming online and seek to institutionalize these newly emergent models of networked learning practices.

4 FLIDA 101: A Pedagogical Allegory

1. According to the *Guinness Book of World Records*, the title of “oldest” university is a matter of dispute, but, generally, the order is accepted as: University of Al-Karaouine, in Fes, Morocco (859); Al-Azhar University in Cairo, Egypt (975); the University of Bologna, Italy (1088); the University of Paris (1150); and Oxford (1167). <http://www.guinnessworldrecords.com/>, accessed July 31, 2009.

2. This hypothetical course highlights the issues raised by virtual learning for traditional institutions and underscores the real, material conditions supporting digital interaction. Currently, there are many existing experimental team-taught, cross-institutional courses, offered in the United States and abroad, that combine face-to-face and virtual environments. A number of these are discussed by John Seely Brown and Richard P. Adler, "Minds on Fire: Open Education, the Long Tail, and Learning 2.0," *Educause Review* 43, no. 1 (2008), 16–32.

3. Steve Anderson and Anne Balsamo, "A Pedagogy of Original Synners," in *Digital Youth, Innovation, and the Unexpected*, ed. Tara McPherson (Cambridge, MA: MIT Press, 2008), 241–259. Anderson and Balsamo use, as an example, an interesting experiment in SL conducted by the Harvard Law School and the Harvard Extension School in fall 2006 called *CyberOne: Law in the Court of Public Opinion*. Harvard law students could enroll in the course at Harvard Law School and attend the class in person; non-law students could enroll through the extension program and could take the class and interact with other students and the professors in SL; and non-Harvard students could review all the materials for the course online for free.

4. http://en.wikiquote.org/wiki/William_Gibson.

5. On March 31, 2008, a start-up called Vivaty announced a three-dimensional virtual chat room that can be added to the Web pages and social networking profiles on sites such as MySpace and Facebook, which are purported to have over 100 million and 65 million registered users, respectively, compared to SL's 13 million accounts. Some predict that Vivaty's or a similar three-dimensional live chat feature could radically diminish SL's appeal, especially in areas where it has extensive traffic, such as gambling and online sex. See Brad Stone, "Online Chat, as Inspired by Real Chat," *New York Times*, March 31, 2008. Croquet is another imminently emergent possibility. For an extended critical ethnography of SL, see Tom Boellstorff's recent book, *Coming of Age in Second Life: An Anthropologist Explores the Virtually Human* (Princeton, NJ: Princeton University Press, 2008).

6. For an example of what SL can do, see: http://www.youtube.com/watch?v=bQL8_HB1HtQ).

7. David Silver comments on “The Future of Learning Institutions in a Digital Age,” Institute for the Future of the Book, comment posted on January 23, 2007, <http://www.futureofthebook.org/HASTAC/learningreport/i-overview>:

The events that HASTAC has organized, or is currently organizing, are really inspired. That said, I strongly believe that engaging undergraduates in digital media and culture is so much more productive than engaging graduate students. I am not suggesting either/or. However, I would like to hear more about how peer-to-peer learning affects undergraduate digital literacy and digital creation. Conferences that attract faculty and graduate students already exist. What we need, I think, are massively distributed digital projects designed and built by massively distributed undergraduates.

Many such undergraduate courses exist. Funding an undergraduate conference is a bigger proposition, and the authors of this book are currently working with HASTAC affiliates to see about taking on this challenge. As Steve Jones at the University of Illinois at Chicago notes in response to Silver’s comment, it is not “massively distributed” undergraduate projects that are needed but rather mechanisms for making any kind of peer-to-peer exchange (even between two students on different campuses) work. Steve Jones, comment on “Future of Learning Institutions in a Digital Age,” Institute for the Future of the Book, <http://www.futureofthebook.org/HASTAC/learningreport/i-overview>. The issue is not size but new intellectual possibility, at any scale. At HASTAC, the authors of this book are experimenting with the “HASTAC Scholars” program, where 50 to 60 undergraduates and graduate students nominated by HASTAC steering committee members take a leadership role not only in reporting on events in their region and at their institutions but in weekly discussion forums, virtual book groups, and in networking together and organizing HASTAC events (including nonhierarchical student-run “un-conferences” and BarConferences).

8. For a recent example of just such an exercise in the deconstructive reconsideration of familiar terms that this book advocates, see the extended list of definitions of *hard drive* in Matthew G. Kirschenbaum’s *Mechanisms: New Media and the Forensic Imagination* (Cambridge, MA: MIT Press, 2008), 86–92. A hard drive is “random access . . . a signal processor . . . differential . . . volumetric . . . rationalized,” and

so on. There is virtually no hardware, software, programming, or Internet terminology that would not benefit from this level of deconstructive scrutiny.

9. SL's home page (<http://secondlife.com/whatis>) includes statistics, charts, and graphs about all aspects of the virtual environment. Katie Salen, ed., *The Ecology of Games: Connecting Youth, Games, and Learning* (Cambridge, MA: MIT Press, 2008), is the best volume by far on the learning potential of games and is part of the pathbreaking MacArthur Foundation book series on Digital Media and Learning. For an excellent analysis of teaching in SL, see Cory Ondrejka's contribution to that volume, "Education Unleashed: Participatory Culture, Education, and Innovation in Second Life," 229–252. Ondrejka was so-called Employee Number 4 at Linden Labs (developers of SL), the first person hired there and one of its leaders until December 2007. He worked at Linden Labs when he wrote this essay.

10. See Shira Boss, "Even in a Virtual World, 'Stuff' Matters," *The New York Times*, September 9, 2007, and Richard Siklos, "A Virtual World but Real Money," *The New York Times*, October 19, 2006.

11. For more information on Evan Donahue's contributions to SL and HASTAC, see <http://www.hastac.org/blogs/evan-donahue/times-they-are-changin>.

12. One of the best assessments of the political geography and cultural studies implications of contemporary universities comes from the 3Cs, the Counter-Cartographies Collective at the University of North Carolina, <http://www.countercartographies.org>.

13. For a superb collection of essays on race and digital media, see Anna Everett, ed., *Learning Race and Ethnicity: Youth and Digital Media* (Cambridge, MA: MIT Press, 2007), another volume in the MacArthur Foundation series on Digital Media and Learning. See also Lisa Nakamura, *Digitizing Race: Visual Cultures of the Internet* (Minneapolis: University of Minnesota Press, 2007).

14. An excellent overview of some of the issues around gender and technology is Justine Cassell and Meg Cramer, "High Tech or High Risk: Moral Panics about Girls Online," in McPherson, *Digital Youth*,

53–76. See Yasmin Kafai, Carrie Heeter, Jill Denner, and Jennifer Sun, eds., *Beyond Barbie to Mortal Kombat: New Perspectives on Gender and Computer Games* (Cambridge, MA: MIT Press, 2008); Anne Balsamo, *Technology of the Gendered Body: Reading Cyborg Women* (Durham, NC: Duke University Press, 1996).

15. Grossberg, in *Caught in the Crossfire*, is one of our most powerful commentator on economic disparity, political rhetoric, and the disturbing demonizing of youth in contemporary America.

16. Daniel J. Solove, *The Future of Reputation: Gossip, Rumor, and Privacy on the Internet* (New Haven: Yale University Press, 2007).

17. No Child Left Behind Act of 2001, Public Law 107–110, 107th Congress (January 8, 2002).

18. “Google jockeying—search engines in the classroom,” *Pandia Search Engine News*, July 3, 2006, <http://www.pandia.com/sew/237-google-jockeying-%E2%80%93-search-engines-in-the-classroom.html>.

19. Lev Manovich directs the Software Studies Initiative at the University of California at San Diego and is the most important proponent of what he terms *cultural analytics*. See Kevin Franklin and Karen Rodriguez, “The Next Big Thing in Humanities, Arts, and Social Science Computing: Cultural Analytics,” *HPC Wire*, July 29, 2008, <http://www.hpcwire.com>.

20. <http://www.johnseelybrown.com/speeches.html>.

21. Such issues seem trivial until one realizes that, on the graduate level, a plus or a change in half a point can constitute being put on probation in a program. *God is in the details*, architects like to say—and sometimes demons reside in details, too.

22. Avery, comment on “Future of Learning Institutions in a Digital Age,” Institute for the Future of the Book, comment posted on March 18, 2007, <http://www.futureofthebook.org/HASTAC/learningreport/i-overview>.

23. Irvine Welsh, *If You Liked School, You’ll Love Work* (New York: W.W. Norton, 2007).

24. Howard Rheingold, *Smart Mobs: The Next Social Revolution* (Cambridge, MA: Perseus Publishing, 2002).
25. Clay Shirky, *Here Comes Everybody: The Power of Organizing Without Organizations* (New York: The Penguin Press, 2008), 233.
26. Henry Jenkins, with Katie Clinton, Ravi Purushotma, Alice J. Robison, and Margaret Weigel, "Confronting the Challenges of Participatory Culture: Media Education for the 21st Century," http://www.digitallearning.macfound.org/atf/cf/%7B7E45C7E0-A3E0-4B89-AC9C-E807E1B0AE4E%7D/JENKINS_WHITE_PAPER.PDF; Henry Jenkins, *Convergence Culture: Where Old and New Media Collide* (New York: New York University Press, 2006).
27. Siva Viswanathan, *The Googlization of Everything*, book in progress, <http://www.googlizationofeverything.com>.
28. Anne Balsamo, comment on "Future of Learning Institutions in a Digital Age," Institute for the Future of the Book, comment posted on August 31, 2007, <http://www.futureofthebook.org/HASTAC/learninreport/i-overview>. See Balsamo, *Technology of the Gendered Body*; Balsamo, *Designing Culture: The Technological Imagination at Work* (forthcoming), for critiques of actual, if hidden, labor under the utopian mythology of the "virtual." For another point of view, see Rob Latham's *Consuming Youth: Vampires, Cyborgs, and the Culture of Consumption* (Chicago: University of Chicago Press, 2002), and his return to Marx's idea of the vampiric nature of commodity capitalism that pretends to be giving life to workers while actually sucking away their life blood.
29. Michael Strangelove, *The Empire of Mind: Digital Piracy and the Anti-capitalist Movement* (Toronto: University of Toronto Press, 2005).

5 Institutions as Mobilizing Networks: (Or, "I Hate the Institution—But I Love What It Did for Me")

1. Connie Yowell's request came in conjunction with MacArthur Foundation President Jonathan Fanton's talk on "The Importance of Institutions," at the John D. and Catherine T. MacArthur Foundation Chicago

Donor's Forum Luncheon, June 22, 2006, <http://www.macfound.org/site/apps/nlnet/content2.aspx?c=IkLXJ8MQKrH&b=1054955&ct=5124893>. Fanton's argument is that institutions provide overt and sometimes hidden supports that undergird transformation as well as tradition. This chapter's definition of *institution* is partly inspired by these remarks. Additionally, Sarita Yardi has urged an emphasis on the role of individuals and groups in the constitution and in the revisioning of institutions. The point is well taken, and this version underscores the role of humans—individual and collective—in the shaping of institutional structures.

2. Rcsha (username only, no information on true identity), responds to this definition in a comment on "Future of Learning Institutions in a Digital Age," Institute for the Future of the Book, comment posted on June 15, 2007, <http://www.futureofthebook.org/HASTAC/learningreport/i-overview>: "What are institutions as mobilizing networks mobilizing people to do? While I like the plasticity of mobility, I worry that like the slipperiness of signs, slipperiness works both for and against one's position."

3. Avner Greif, *Institutions and the Path to the Modern Economy* (Cambridge: Cambridge University Press, 2006).

4. Robert O. Keohane, *International Institutions and State Power: Essays in International Relations Theory* (Boulder, CO: Westview Press, 1989), 3; Keohane, email to authors, September 24, 2006. In correspondence over this definition of *institution*, Keohane indicated that he has modified his 1989 definition, inserting the phrase "along with norms and beliefs" into the original.

5. This definition complements but is to be distinguished in emphasis from Actor Network Theory. The latter emphasizes the ways in which people interact with one another to individualized ends. This book's concept of institutions as mobilizing networks focuses by contrast on the outcomes of interactive arrangements among individuals. For further discussion of interactive arrangements, see Howard Rheingold, *Smart Mobs: The Next Social Revolution* (New York: Basic Books, 2003).

6. This definition is itself collaborative and was written with feedback, input, and constructive (and vigorous) disagreement from many colleagues: Anne Allison (Anthropology), Srinivas Aravamudan (English), Anne Balsamo (Interactive Media), James Boyle (Law), Rachael Brady (Electrical and Computer Engineering), Jonathon Cummings (Marketing), Neil DeMarchi (Economics), Kevin Franklin (Education and Grid Computing), Lawrence Grossberg (Communications and Cultural Studies), Harry Halpin (Philosophy and Computer Science), Andrew Janiak (Philosophy), Robert Keohane (Political Science), Julie Klein (English and Interdisciplinary Studies), Timothy Lenoir (History and New Technologies and Society), David Liu (Religion), Dana D. Nelson (American Studies and Political Theory), Mark Olson (New Media and Communications), Kenneth Rogerson (Public Policy), Kristine Stiles (Art History), and Kathleen Woodward (English). Lawrence Grossberg offered the most extended and persistent critique of this definition. He will not agree with the final version but his critiques allowed the clarification of a number of points.

7. Eileen McMahon, comment on “Future of Learning Institutions in a Digital Age,” Institute for the Future of the Book, comment posted on March 20, 2007, <http://www.futureofthebook.org/HASTAC/learningreport/i-overview>. McMahon notes that there are a number of institutions that are not modeled after patriarchal hierarchies and that may well be models for participatory learning institutions: New England Shaker communities, computer/technical user groups like MSMUB, ACM SIGs, MUDS/Moos, yoga organizations such as Syda, and quilting circles. Contributor David Silver underscores the importance of libraries as a model for the networked, circulating learning center operating both within and across, inside and outside, of traditional learning institutions. Steve Jones notes, on the other hand, that students themselves find and make learning spaces within traditional institutions (including libraries) and make networks and learning communities in cafeterias, lounges, and computer labs, repurposing an institution's nooks and crannies as learning spaces.

8. James Boyle, “Mertonianism Unbound? Imagining Free, Decentralised Access to Most Cultural and Scientific Material” (Indiana University: The Digital Library of the Commons, 2006); Yochai Benkler,

"Coase's Penguin, or Linux and the Nature of the Firm," *Yale Law Journal* 112, no. 3 (2002).

9. Microsoft is releasing WorldWide Telescope free of charge to the astronomy and educational communities (though open-source release of the code would go a step further and be even more appealing).

10. Siva Vaidhyanathan's Web site and forthcoming collaborative book are both entitled *The Googlization of Everything: How One Company is Disrupting Culture, Commerce, and Community—and Why We Should Worry*, <http://www.googlizationofeverything.com>

11. For more information on these centers and organizations, see Bibliography II: Resources and Models.

12. Rishab Aiyer Ghosh, ed., *CODE: Collaborative Ownership and the Digital Economy* (Cambridge, MA: MIT Press, 2005).

13. Jochen Fromm, *The Emergence of Complexity* (Germany: Kassel University Press, 2004); Steven Johnson, *Emergence: The Connected Lives of Ants, Brains, Cities, and Software* (New York: Scribner, 2001).

14. John Seely Brown and Paul Duguid, "The University in the Digital Age," *Times Higher Education Supplement*, May 10, 1996: 1–4; Jonathon Cummings and Sara Kiesler, "Collaborative Research Across Disciplinary and Organizational Boundaries," *Social Studies of Science* 35 (2005): 703–722.

6 HASTAC

1. William Wulf, "The National Collaboratory," in *Towards a National Collaboratory* (unpublished report of a National Science Foundation invitational workshop, Rockefeller University, New York, March 1989).

2. Mechelle de Craene volunteered in fall 2007 to host a site primarily for others in K–12 education. HASTAC on Ning, "A Synergistic Symposium for the Cybernetic Age" (<http://hastac.ning.com>), is now an exceptionally active and physically beautiful site that feeds onto the HASTAC home page and is featured in *Needle*, the HASTAC Information

Commons. Additionally, blogs from the HASTAC page are automatically fed via Really Simply Syndication (RSS) to the HASTAC on Ning site.

3. Anne Balsamo, comment on “The Future of Learning Institutions in a Digital Age,” Institute for the Future of the Book, comment posted on August 31, 2007, <http://www.futureofthebook.org/HASTAC/learninreport/i-overview>.

4. Patricia Seed, comment on “Future of Learning Institutions in a Digital Age,” Institute for the Future of the Book, comment posted on May 11, 2007, <http://www.futureofthebook.org/HASTAC/learningreport/i-overview>.

5. On Ancient Rome 3D, see <http://www.google.com/educators/romecontest.html>; on Portuguese maps of West Africa, see <http://www.nh.gov/news/humanities/2008-11/ConeOfAfrica.html>.

6. For example, some of the fundamental features of HASTAC were presaged by the 1999 establishment of Information Science+Information Studies, <http://www.isis.duke.edu>. ISIS is a certificate program designed to teach those who will be creating the next generation of technology to think creatively, critically, and in a socially responsible manner about its use and application. It is a program where students both analyze and create collaboratively and across disciplines.

7. Though this book does not address the legal rights and responsibilities of virtual institutions, legal theories being developed for online multiplayer games and their applicability to other forms of distribution and adjudication of virtual real estate, including peer-to-peer institutions, raise interesting issues. See F. Gregory Lastowka and Dan Hunter, “The Laws of the Virtual Worlds,” *Legal Theory Research Paper Series, University of Pennsylvania Law School* 26 (2003).

8. Erin Ennis, Zoë Marie Jones, Paolo Mangiafico, Mark Olson, Jennifer Rhee, Mitali Routh, Jonathan E. Tarr, and Brett Walters, eds., *Electronic Tectonics: Thinking at the Interface* (lulu.com, 2008). See also videos of the conference on the HASTAC Web site, <http://www.hastac.org/video/archives>.

9. <http://www.hastac.org/node/1532>.
10. Many of the days at SECT were blogged on the HASTAC Web site, <http://www.hastac.org>. Webcasts of the events are also available at <http://www.uchri.org>.
11. Shirky, *Here Comes Everybody: The Power of Organizing without Organizations* (New York: Penguin Press, 2008).
12. The bicoastal HASTAC team for the first HASTAC/MacArthur Foundation Digital Media and Learning Competition included: at Duke University, Cathy N. Davidson, Jason Doty, Erin Ennis, Mark Olson, Jonathan Tarr, and Brett Walters; and at UCHRI, David Theo Goldberg, Suzy Beemer, Khai Tang, Annette Rubado-Mejia, and Jenifer Wilkens.
13. Michael Hardt and Antonio Negri, *Commonwealth*, (Cambridge: Harvard University Press, 2009)
14. Thomas Finholt and Gary Olson, "From Laboratories to Collaboratories: A New Organizational Form for Scientific Collaboration," *Psychological Science* 8, no. 1 (1997): 28–36.
15. Hassan Masum and Yi-Cheng Zhang, "Manifesto for the Reputation Society," *First Monday* 9, no. 7, July 5, 2004, <http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1158/1078>.
16. Masum and Zhang, "Manifesto for the Reputation Society."
17. Steve Jones, comment on "The Future of Learning Institutions in a Digital Age," Institute for the Future of the Book, comment posted on February 3, 2007, <http://www.futureofthebook.org/HASTAC/learninreport/i-overview>.
18. Mike Roy, comment on "The Future of Learning Institutions in a Digital Age," Institute for the Future of the Book, comment posted on March 27, 2007, <http://www.futureofthebook.org/HASTAC/learningreport/i-overview>.
19. 501(c) is a provision of the United States Internal Revenue Code (26 U.S.C. 501[c]) listing 26 types of nonprofit organizations exempt from some federal income taxes.

20. Yochai Benkler, *The Wealth of Networks: How Social Production Transforms Markets and Freedom* (New Haven: Yale University Press, 2006): 460–461.
21. Benkler, *The Wealth of Networks*, 463.

7 (In)Conclusive: Thinking the Future of Digital Thinking

1. Robert Kraut, M. Patterson, V. Lundmark, S. Kiesler, T. Mukhopadhyay, and W. Scherlis, "Internet Paradox: A Social Technology That Reduces Social Involvement and Psychological Well-Being?" *American Psychologist* 53, no. 9 (1998): 1017–1032.
2. Robert Kraut, Sara Kiesler, Bonka Boneva, Jonathon Cummings, Vicki Helgeson, and Anne Crawford, "Internet Paradox Revisited" *Journal of Social Issues* 58 no. 1 (2002): 49–74. See also Mizuko Ito et al., *Living and Learning with New Media: Summary of Findings from the Digital Youth Project*, (Cambridge, MA: MIT Press, 2009).
3. Shirky, *Here Comes Everybody*, 16.
4. Shirky, *Here Comes Everybody*, 16.
5. Malcolm Gladwell, *The Tipping Point: How Little Things Can Make a Big Difference* (New York: Little, Brown, 2002).
6. Lawrence Cremins and Freeman Butts, *A History of Education in American Culture* (New York: Holt, Rinehart and Winston, 1961). *A History of Education* is an early and generally positive account of the transformation from the religious-based colonial school to the nationalist model of public education. As many subsequent historians have noted, this account simplifies the ways that gender, race and ethnicity, class, region, country-of-origin, language, political persuasion, and religious differences have all, in different ways, been inflected as un-American within public education in an attempt to instill a unified, homogenous nationalist identity on a diverse and ever-changing population. For one of many critiques of nationalist educational policy, see David L. Angus and Jeffrey E. Mirel, *The Failed Promise of the American High School, 1890–1995* (New York: Teachers College Press, 1999). See also

Cathy N. Davidson, "Literacy, Education, and the Reader," in *Revolution and the Word: The Rise of the Novel in America* (New York, NY: Oxford University Press, 1986), 121–50; Dana Nelson Salvino, "The Word in Black and White: Ideologies of Race and Literacy in Antebellum America," in *Reading in America*, ed. Davidson, 140–156; Christopher Newfield, *Ivy and Industry: Business and the Making of the American University, 1880–1980* (Durham, NC: Duke University Press, 2004); Newfield, *Unmaking the Public University: The Forty-Year Assault on the Middle Class* (Cambridge, MA: Harvard University Press, 2008).

7. Tara McPherson, "A Rule Set for the Future," in *Digital Youth*, ed. McPherson, 1–26.

8. "Internet World Stats: Usage and Population Statistics," which records world Internet user numbers, indicates that, in 2009, Internet penetration was 74.4% of North Americans and only 5.6% of the population of Africa, with wide-ranging disparities by country, economic status, and region within those continents as well. Africa and the Middle East are seeing the most rapid new adoption of digital technologies worldwide but the numbers still lag far beyond those in the developed world, <http://www.internetworldstats.com/stats.htm>.

9. Andy Kroll, "Gated Communities of Learning," April 3, 2009, <http://www.salon.com/news/feature/2009/04/03/kroll/index.html>. Kroll notes: "Over the past 30 years, the average annual cost of college tuition, fees, and room and board has increased nearly 100 percent, from \$7,857 in 1977–78 to \$15,665 in 2007–08 (in constant 2006–07 dollars). Median household income, on the other hand, has risen a mere 18 percent over that same period, from about \$42,500 to just over \$50,000. College costs, in other words, have gone up at more than five times the rate of income."

10. For an excellent discussion, see Miriam J. Metzger and Andrew J. Flanagin, eds., *Digital Media, Youth, and Credibility*, (Cambridge, MA: MIT Press, 2008).

11. Barry Wellman, Janet Salaff, Dimitrina Dimitrova, Laura Garton, Milena Gulia, and Caroline Haythornthwaite, "Computer Networks as Social Networks: Collaborative Work, Telework, and Virtual Community,"

Annual Review of Sociology 22 (1996): 213–238. Mike Roy asked: “can you actually organize emergent behaviors? What motivates people to contribute to these sorts of projects? What does the reward structure for contributing look like? (It should be noted that one of the main reasons for Linux achieving its remarkable success is that IBM dedicated serious resources to transforming it into production-level code as a means of avoiding having to pay license fees for its servers.)” Mike Roy, comment on “The Future of Learning Institutions in a Digital Age,” Institute for the Future of the Book, comment posted on March 27, 2007, <http://www.futureofthebook.org/HASTAC/learningreport/i-overview>.

12. <http://lecturecast.sdsc.edu/16114.ram> and <http://lecturecast.sdsc.edu/16115.ram>.

13. For an excellent analysis of the pedagogical requirements for a digital age, see Steve Anderson and Anne Balsamo, “A Pedagogy for Original Synners,” in McPherson, ed., *Digital Youth*, 241–259; Jenkins, *Confronting the Challenges of Participatory Culture*. Both of these works offer prescriptions for new forms of learning in a digital age, at points similar and in other ways different from the forms presented in this book but with similar goals and objectives.

14. See, for example Millie Niss, *Oulipoems*, <http://www.uiowa.edu/~iareview/tirweb/feature/sept04/oulipoems/index.html>.

15. See the entry on “Wikipedia” on Wikipedia, <http://en.wikipedia.org/wiki/Wikipedia>.

16. For a concise collection of essays addressing explicitly the issue of credibility in collaborative learning environments, see Metzger and Flanagin, eds., *Digital Media*.

17. Jenkins, *Convergence Culture*, 257.