

Online Communities & Crowds:

Foundations, Dynamics, and Challenges of Online Collaboration

*Northwestern University
Communication Studies 378*

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Office hours: Mon. & Wed. 3:30-4:30pm and by appointment.

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Monday, Wednesday 2-3:20pm, & Friday 2:00pm-2:50pm
Location: Frances Searle Building, 2-107

Course Description

The most innovative and ground-breaking organizations today are online “peer production” communities and crowds. Distributed groups collaborate over the Internet to write free encyclopedias (Wikipedia), launch social movements (Avaaz, MoveOn), create software (GNU/Linux), share music and films (the Pirate Bay), develop innovative products (CHDK), and conduct advanced scientific research (Zooniverse).

When and why do these efforts succeed? What motivates participants to join, contribute, and sustain these communities? How can online communities’ and crowds’ successes be harnessed and reproduced? What can be learned from their shortcomings?

This course presents an intensive and interdisciplinary introduction to the study of online communities and crowds, with a particular emphasis on how and why some of these systems are so wildly effective at mobilizing and organizing people in ways that seem to have been impossible a few decades ago. Throughout the quarter, we will analyze these and other conceptual puzzles, studying many different communities in the process. Readings and assignments will draw on current research in the social sciences (Communication, Sociology, Economics, Sociology), Human Computer Interaction, law, and social theory.

Learning Objectives

My primary objectives for all students taking this course are that you:

- Analyze, discuss, understand, and critically engage with central concepts, examples, and issues relevant to online communities and crowds.

- Experience and apply practical approaches to online participation, collaboration, innovation, teamwork, and collective action.
- Reflect on (assess) and iteratively improve upon your own work and that of your peers in light of the concerns analyzed in class.
- Identify and elaborate original problems and approaches to online collaboration, extending and expanding on the material presented in class.

In order to accomplish these objectives, the course has a fairly wide-ranging syllabus with different kinds of assignments and exercises requiring you to approach online communities and crowds from several different perspectives. At some point, there is a good chance that you will find yourself thinking about an unfamiliar issue in an unfamiliar way. This may not be comfortable or easy, but that is part of the plan, and I hope you'll embrace the challenge.

Organization

The course covers four overlapping dimensions of the study of online communities and crowds:

1. Foundations: key underlying concepts and narratives.
2. Dynamics: issues communities face and solve every day.
3. Cases: key examples of online communities and crowds.
4. Challenges: deep, hard problems nobody has solved (yet!).

We start with a heavier emphasis on foundations and dynamics then move towards the discussion of more cases and challenges. That said, we will integrate our discussions of these four dimensions throughout the quarter and you should aim to understand them as a (loosely) coherent whole.

Course Format and Materials

The course sessions will follow a mixed format, including some lectures, discussions, group projects, and visits from guest speakers. Up-to-date information about readings, scheduling, assignments and more can be found on the course website:

<http://aaronshaw.org/teaching/2014/occ>

Most of the readings are or will be available online. In general, all assignments will be finalized and posted to the course website at least one week before they are due. In other words, make sure to check the course website consistently as things may change. I will plan to communicate changes to you in class and (when appropriate) via email. If you want to complete assignments more than a week in advance, please discuss your plans with me so that I can confirm the assignments with you.

Requirements

There are no prerequisites for the class. You are expected to perform all the usual activities associated with college-level courses: prepare for, attend, and participate actively in all class sessions; complete assignments in a timely manner; and abide by all applicable norms and policies (see below).

Assignments and Evaluation

You will be asked to submit the following, all of which will be evaluated as part of your grade for the course (percentage in parentheses):

- Group discussion question writeups (15%).
- Experiential assignments portfolio (20%).
- Peer assessment portfolio (15%).
- Critical community analysis #1 (5%).
- Final project (critical community analysis #2) proposal (5%).
- Final project (critical community analysis #2) (20%).

Brief descriptions of these assignments are provided in the following section. Additional details including deadlines will be provided via the course website and in class.

An additional 20% of your final grade will evaluate your participation and overall engagement with the course material. As part of this, you are required to meet with Sneha Narayan, the Teaching Assistant for the course, *at least once before the final project proposal is due*. My strong recommendation is that you meet with Sneha sooner rather than later – both because she'll have helpful feedback and because her schedule will undoubtedly fill up closer to the deadline (when it will be too late for you to take full advantage of her advice anyway). **Sneha's office hours will be Thursdays, 2-4pm (or by appointment) in Frances Searle 2-419.** You can contact her at snehanarayan@gmail.com (see email protocol below).

In general, you should plan to submit all your assignments via Canvas. Since Canvas is new at Northwestern and it might prove difficult/annoying to use, you can always also email your assignments to the teaching team if you encounter any technical difficulties or uncertainties.

Many of these assignments either obligate or allow you to work in teams. Whenever you collaborate with one or more of your peers on an assignment, you are required to include the names of your collaborators on the assignment at the time you hand it in. In some cases, all individuals will be asked to submit their own copy of the assignment even when they have collaborators.

Teaching team email protocol

When emailing either member of the teaching team about anything related to the course, please put “[occ]” in the subject line. We both get a lot of email and this will help us stay on top of it.

Labs

Additional details will be provided about the Friday lab sessions in class. Please note that many of the activities in the lab sessions will require (or at least be much easier with) a networked computing device with a decent size keyboard (e.g., laptop or tablet). We are working on securing access to additional devices, so if you need one, please contact a member of the teaching team.

Brief Descriptions of Larger Assignments

The Group Discussion Question Responses are brief (200-300 word) written responses to several discussion questions that you will co-author with a group of peers at several points throughout the quarter. These will usually be due before Monday classes. They are intended to facilitate critical reflection and engagement with the course material.

The Experiential Assignments Portfolio includes the output of four experiential assignments (several to-be completed in groups) as well as (individually) written responses to reflection questions about your experiences. The four assignments include: creating a tutorial on WikiHow; writing and publishing a Wikipedia article; two in-class teamwork challenges; and performing crowd work/volunteering on DuoLingo and Zooniverse.

The Peer Assessment Portfolio contains several different peer assessment assignments that you will complete throughout the quarter. In general, these will involve you providing written assessments and feedback on the work of your peers.

Critical Community Analysis #1 takes the form of a short (about 1000 words) written analysis of a particular dynamic or problem in a particular community (both to-be-assigned by the teaching team) in which you describe the community, how the dynamic/problem works, and propose improvements or solutions based on material discussed in class. You will have about 48 hours to complete this assignment.

Final Project, a.k.a. Critical Community Analysis #2 consists of an original research paper of **no more than 2000 words** that also includes relevant citations and sources (which do not need to be counted in the word total). The objective is for you to analyze a particular puzzle or dynamic in the context of a specific community that you observe, participate in, and/or care about. You should aim to (a) describe the community; (b) explain how and why the community illustrates or engages with the puzzle or dynamic; and (c) explain how you would apply insights from the class to improve the community's approach to the puzzle or dynamic. You will have several opportunities throughout the quarter to develop your project ideas, discuss them, and receive feedback on them. This includes the **Final Project Proposal**, which will consist of a short (about 500 words) written description of the community you plan to analyze, some discussion of why you care about it, as well as the reasons you believe it would present an important site for critical analysis and engagement with the themes of the course. **Final projects are due by 5pm on Tuesday, December 9, 2014.**

Course Policies

The policies below outline fundamental groundrules for the class. If you have questions or concerns about any of them, please contact me.

Attendance

Attendance in class is expected of all participants. If you need to miss class for any reason, please contact a member of the teaching team ahead of time (email is best). Multiple unexplained absences will likely result in a lower grade or (in extreme circumstances) a failing grade. In the event of an absence, you are responsible for obtaining class notes, handouts, assignments, etc.

In-class Use of Digital Devices with Screens

I ask that you refrain from using your laptops, tablets, phones, and pretty much any (digital) device with a screen during the class meetings that are not labs. Note that this is not a requirement. You may, if you need or choose to do so, bring and use any device in the classroom. However, I may (privately) let you know if I feel that your in-class device usage is negatively impacting your participation in the course.

The goal of this policy is to help you stay focused and avoid distractions for yourself and your peers in the classroom. This turns out to be difficult in the presence of powerful computing devices with brightly glowing screens and fast connections to the Internet. For more on the rationale behind this policy, please read [Clay Shirky's thoughtful discussion](#) of his approach to this issue.

Deadlines & Extensions

Deadlines for all assignments are non-negotiable. Any assignment you submit after the deadline may be penalized or returned (un-graded) at my discretion. That said, I understand that emergencies happen. Unanticipated obstacles arise. If you absolutely cannot meet a deadline, please contact me. Keep in mind that I will be more sympathetic to your situation if you do this *before* the deadline instead of afterwards.

Confidentiality of Peers' Work

Throughout the course, you will receive, read, and comment on classmates' work. These assignments are for class use only. You may not share them with anybody outside of class without explicit written permission from the work's author pertaining to the specific piece.

Confidentiality of In-Class Discussions

It is essential to the success of this class that all participants feel comfortable sharing their questions, thoughts, ideas, confusions, and experiences during class discussions. Therefore, you may not create any audio or video recordings during class time nor share verbatim comments with those not in class nor are you allowed to share using other methods – e.g., social media – comments linked to

people's identities unless you get appropriate permissions ahead of time. If you want to share general impressions or specifics of in-class discussions with those not in class, ask for permission first.

Academic Integrity

You are responsible for reading and abiding by the Northwestern University [Principles Regarding Academic Integrity](#). Make sure to document all of your work and acknowledge the ideas and work of others. Possible sanctions, as per the university guidelines, include reduced or failing grade, a defined period of probation or suspension, exclusion from the university and notation on the official record. You must not, in any way, misrepresent your work or be party to another student's failure to maintain academic integrity. Do not ever copy other people's words without quotation marks (do not do this even if you are "just" taking notes) and always use proper citation. Do not ever refer to other people's work without attribution. DO NOT cheat, plagiarize or disregard the University [Principles Regarding Academic Integrity](#) in any way, it is NOT worth it! When in doubt, err on the side of giving more credit to the original source rather than less. Please feel free to ask me questions about this and any related matters!

Students with Disabilities

Any student requesting accommodations related to a disability or other condition is required to register with AccessibleNU (847-467-5530) and provide professors with an accommodation notification from AccessibleNU, preferably within the first two weeks of class. All information will remain confidential. For more information, visit the [AccessibleNU website](#).

Sexual Harassment

All participants in this class are bound by the [Northwestern University sexual harassment policy](#). Please note, that the core of the policy states, "no member of the Northwestern community may sexually harass any other member of the community." Please review the policy and speak to me if you have any questions or concerns.

Incompletes

Incompletes are sensible in theory, but usually turn out to be a total pain for everybody involved and I strongly discourage them. If you wish to request an incomplete for the class, you should explain your reasons to me *in writing* at least two weeks before the end of the quarter and propose a timeline for completing the course. Please note that I may decline your request.

Grades

If you have questions or concerns about any grade you receive, please contact me. If you wish to dispute a grade, please provide a written explanation of your rationale along with any supporting documentation you think is necessary.

Course Topics

Please note that this is not a schedule, but a list of the topics we will cover. Up-to-date information (including dates and assignment information) will be available on [the course website](#).

0 – Introductions

Introductory information about the course, goals and expectations for the quarter, logistics, etc. Some foundational topics: What is the Internet? What are public goods?

The Wikipedia articles on Internet & History of the Internet (URLs on the course website).

(Optional) Stephenson, N. (1996). Mother earth mother board. *Wired Magazine*, 4(12).¹

1 – Cyberculture! Early Online Communities

How did the earliest online communities start? What were they like? Who participated and why? What were the cultural origins and undercurrents of these environments?

Hafner, K. (1997). The epic saga of the WELL. *Wired Magazine*.

Turner, F. (2005). Where the counterculture met the new economy: The WELL and the origins of virtual community. *Technology and Culture*, 46(3):485–512.

(Optional) Watch the panel symposium “From Counterculture to Cyberculture: the Legacy of the Whole Earth Catalog” at Stanford University, 2011 (Including the Q&A!). Available on [YouTube](#).

(Optional) Watch and/or read Steve Jobs’ 2005 Stanford Commencement Address. Available via [Stanford News](#).

2 – Code & Other Laws: Rules and Governance in Cyberspace

What does it mean to instantiate a community in code? Why does code (or other aspects of technical infrastructure) matter? How do the virtual aspects of online communities affect the formation and enforcement of norms and rules?

Lessig, L. (2006). *Code: And Other Laws of Cyberspace, Version 2.0*. Basic Books, New York, NY. Selections TBA.

¹This article is optional because it is shockingly long. As in, so long, I have no idea how a magazine ever published it. It is also pretty mind-blowing and relevant to the class material. If you manage to read it, I hope you enjoy it!

3 – Commons, Public Goods, and Collective Action

What are “commons” and why (or why not) might they be tragic? How do they relate to public goods? What is collective action and how does it happen? What role do technologies and socio-technical infrastructure play in common pool resources and collective action? Why is any of this stuff relevant to the study of online communities and crowds?

Ostrom, Elinor. 2004. “Understanding Collective Action,” International Food Policy Research Institute (IFPRI) Focus Brief, 11(2).

Olson, M. (1965). *The logic of collective action: public goods and the theory of groups*. Harvard University Press, Cambridge, MA. Selections from Chapters 1 & 2.

4 – n00bs! Newcomers in Online Communities

Special Guest: Krystle Chung, Community Manager, WikiHow, Inc.

Why do newcomers matter for online communities and crowds? How do newcomers first get involved in a community? What is the experience of being a newcomer like? What factors determine whether newcomers make productive contributions and come back or not? What social and technical interventions can improve newcomer experiences?

Morgan, J. T., Bouterse, S., Walls, H., and Stierch, S. (2013). Tea and sympathy: crafting positive new user experiences on wikipedia. In *Proceedings of the 2013 conference on Computer supported cooperative work*, CSCW '13, pages 839–848, New York, NY, USA. ACM.

WikiHow tutorials and newcomer documentation (TBA).

Start WikiHow assignment (TBA).

5 – Lab: Complete WikiHow Assignment

6 – How Motivation and Commitment Drive Participation

What motivates participants to join online communities? What leads people to stick around and become committed, active contributors? We focus on the importance of motivation and commitment for building successful, engaged communities. We also consider technical and social mechanisms for building motivation and commitment.

Kraut, R. E. and Resnick, P. (2011). *Building Successful Online Communities: Evidence-Based Social Design*. MIT Press, Cambridge, MA. Chapter 2 or Chapter 3.

Additional readings TBA.

7 – Lab: WikiHow Peer Assessment & Wikipedia Task #1

8 – Phreaks, Hackers, Pirates, and Other Rule-Breakers

Many members of early online communities viewed themselves as counter-cultural. Even today, online environments remain bastions of transgressive behaviors. We'll spend a little time on the “dark side” of the Internet in order to understand this pervasive phenomenon and think more broadly about the role of norms, rules, and governance in online communities.

Critical community analysis #1 due

Rosenbaum, R. (1971). Secrets of the little blue box. *Esquire*, (October).

Larkin, B. (2004). Degraded images, distorted sounds: Nigerian video and the infrastructure of piracy. *Public Culture*, 16(2):289–314.

9 – Free/Libre and Open Source Software I

What is Free/Libre and Open Source Software (sometimes abbreviated FLOSS)? Where did FLOSS come from and what does it do? What sorts of freedoms are involved and implied by FLOSS? Why does FLOSS matter as a technological, economic, and political phenomenon?

Fogel, K. (2009). *Producing Open Source Software: How to Run a Successful Free Software Project*. O'Reilly Media, Inc. Introduction (includes “History” & “The Situation Today”).

Stallman, R. (1984). The GNU manifesto.

Stallman, R. (1989). The GNU general public license, version 1.

10 – Lab: Peer Assessment Community Analysis #1 & Wikipedia Task #2

11 – Culture & Norms (in Wikipedia)

Since it began in 2001, Wikipedia has developed an elaborate set of cultural norms and routines around participation. What are some of the most important norms and principles that underpin Wikipedia's culture of collaboration? Why do they matter

Reagle, J. (2010). *Good faith collaboration : the culture of Wikipedia*. MIT Press, Cambridge Mass. Chapters 1 & 3.

12 – Teamwork (in general)

Teams constitute a critical piece of the social and organizational infrastructure of everything we discuss in this class. Today, we'll take a step back from the context of specific communities to think (and do) more about teamwork and collaboration dynamics in general.

Hackman, J. R. (2004). What makes for a great team?.

Hackman, J. R. (1998). Why teams don't work. *Leader to Leader*, (Winter):24–23.

13 – Lab: Teamwork Assessment & Wikipedia Task #3

14 – Peer Production I

What is peer production (and how is it different from social production, crowdsourcing, online communities and the other things we are studying in this course)? Why does it work in theory? We'll focus particularly on the role of technical infrastructure, motivation, barriers to entry, and failure in peer production communities.

Benkler, Y. (2006). *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. Yale University Press, New Haven. Selections from Chapters 2 & 3.

Shirky, C. (2008). *Here Comes Everybody: The Power of Organizing Without Organizations*. Penguin Press, New York. Chapter 10 (“Failure for Free”).

15 – Peer Production & FLOSS II: Movements & Ideals

Special Guest: Professor Benjamin Mako Hill (Communication, University of Washington).

What is the relationship of FLOSS to hacking and “hacker ethics”? How do projects function (as communities, organizations, movements, or something else entirely)? How did FLOSS grow from a weird idea into an international movement, massively important business practice, and more? What is the present state and future of FLOSS?

Re-read Stallman, R. (1984). The GNU manifesto.

Raymond, E. S. (2001). *The Cathedral & the Bazaar: Musings on Linux and Open Source by an Accidental Revolutionary*. O'Reilly Media, Inc., Sebastopol, CA. Selections TBA.

Debian (1997). Debian social contract, version 1.0.

16 – Lab: Wikipedia Task #4 (Publish your article!)

17 – Innovation Communities

Where do innovative, new ideas come from? What purpose does innovation serve and how can it be reproduced? We'll analyze several innovation communities to think about why they illustrate patterns and dynamics that are relevant to the broader study of online communities and crowds.

von Hippel, E. (2005). *Democratizing innovation*. The MIT Press, Cambridge, Massachusetts. Chapters 1 & 2.

18 – Cultural Production & Creativity

Supposedly, paraphrasing a famous ruling from the U.S. Supreme Court, “on the Internet anyone can become a pamphleteer.” What impact have the expansive opportunities for media and cultural production online made in society? What are the implications of more equitable access to the tools of media production and distribution in a networked public sphere?

Lawrence Lessig (2008). *Remix : making art and commerce thrive in the hybrid economy* / Lawrence Lessig. Penguin Press, New York. Selections TBA.

Taylor, A. (2014). *The people's platform: and other digital delusions*. Metropolitan Books, New York. Selections TBA.

19 – Lab: Wikipedia Task #5 & Crowdsourcing Assignment

20 – Crowd Work & Citizen Science

Special Guest: TBA.

A variety of online crowds perform distributed “microtasks” (sometimes in exchange for money). Aggregated together, tiny acts acquire immense computational power. How does this sort of “human computation” work and where is it flourishing? What possibilities are there for the future of crowd work, citizen science, and related crowd-powered systems?

Final project proposal due.

Watch: von Ahn, Luis TEDx talk: “Massive-scale online collaboration,” Available on the [TEDx-CMU site](#).

Fortson, L., Masters, K., Nichol, R., Borne, K. D., Edmondson, E. M., Lintott, C., Raddick, J., Schawinski, K., and Wallin, J. (2012). Galaxy zoo: Morphological classification and citizen science. In *Advances in Machine Learning and Data Mining for Astronomy*, pages 213–236.

21 – Human Computation (with a Human Face?)

In the second half of our point-counterpoint discussion on crowd systems, we consider the ethical dimensions and human costs of certain forms of crowd work. What happens when you put a human face (and cost) on human computation?

Watch: Jonathan Zittrain “Minds for Sale” talk. Available on (link TBA).

22 – Lab: Peer Assessment of Proposals & Wikipedia Task #6

23 – Politics, Advocacy, & Movements I

Special Guest: TBA.

How do the emergence of online communities and crowds affect politics, political campaigning, and advocacy organizations?

Obama For America (2013). The obama campaign legacy report. Technical report. Selections, TBA.

Bennett, W. L. and Segerberg, A. (2012). The logic of connective action. *Information, Communication & Society*, 15(5):739–768.

24 – Politics, Advocacy, & Movements II

We continue to discuss how the emergence of online communities and crowd-based systems affects political organizations, focusing on the relationship between politicized online communities and state power more generally. We’ll focus our discussion on the rise of “Narcotweets” in Mexico.

Monroy-Hernández, A., Kiciman, E., boyd, d., and Counts, S. (2012). Narcotweets: Social media in wartime. In *Sixth International AAAI Conference on Weblogs and Social Media*.

(Optional) Watch: Andrés Monroy-Hernández and Panagiotis Metaxas Berkman Center Luncheon Series presentation on Narcotweets, available on the [Berkman Center website](#).

25 – Lab: Team Puzzle Challenge

26 – Tough Problem #1: Creating New Communities

The vast majority of attempts to create new online communities fail. Why? What factors determine whether communities grow, attract participants, and survive over many years?

Hill, B. M. (2013). Almost wikipedia: What eight early online collaborative encyclopedia projects reveal about the mechanisms of collective action.

Team puzzle challenge assessment due.

27 – Tough Problem #2: Building Inclusive Communities

Participation online is theoretically open to all, but that does not mean it is actually accessible or equitable. Focusing on the LilyPad open hardware hacking community, we'll consider how “second order” digital divides affect who does and does not get involved in online communities.

Buechley, L. and Eisenberg, M. (2008). The LilyPad arduino: Toward wearable engineering for everyone. *IEEE Pervasive Computing*, 7(2):12–15.

Buechley, L. and Hill, B. M. (2010). LilyPad in the wild: how hardware's long tail is supporting new engineering and design communities. In *Proceedings of the 8th ACM Conference on Designing Interactive Systems*, DIS '10, pages 199–207, New York, NY, USA. ACM.

(Optional): Hargittai and Shaw. Mind the Skills Gap.

28 – Tough Problem #3: Informed but Unempowered?

How can peer production communities engage more participants over the long haul? We began this course discussing the vision of information sharing developed in the free software and free culture communities. Here we take a step back to revisit this vision and evaluate the impact of these movements over the past few decades.

In class: project lightning talks and peer feedback in groups.

29 – Closing Arguments

What themes and conclusions can we synthesize from the course material? Where do we go from here? What does the future hold for online communities and crowds?

In class: Project lightning talks and peer feedback in groups.

Final projects due at 5pm, December 9, 2014.

Acknowledgments & Credits

This course builds on and borrows heavily from similar courses offered by two young professors whose approach to this material and to teaching I admire a great deal: [Benjamin Mako Hill's class Interpersonal Media](#) at the University of Washington and [Joseph Reagle's class Online Communities](#) at Northeastern University. In addition, some of the course policies are borrowed from [Eszter Hargittai](#), my wonderful colleague in Communication Studies here at Northwestern, and (as I mentioned earlier) the amazing [Clay Shirky](#), who teaches at NYU.

References

- Benkler, Y. (2006). *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. Yale University Press, New Haven.
- Bennett, W. L. and Segerberg, A. (2012). The logic of connective action. *Information, Communication & Society*, 15(5):739–768.
- Buechley, L. and Eisenberg, M. (2008). The LilyPad arduino: Toward wearable engineering for everyone. *IEEE Pervasive Computing*, 7(2):12–15.
- Buechley, L. and Hill, B. M. (2010). LilyPad in the wild: how hardware's long tail is supporting new engineering and design communities. In *Proceedings of the 8th ACM Conference on Designing Interactive Systems*, DIS '10, pages 199–207, New York, NY, USA. ACM.
- Debian (1997). Debian social contract, version 1.0.
- Fogel, K. (2009). *Producing Open Source Software: How to Run a Successful Free Software Project*. O'Reilly Media, Inc.
- Fortson, L., Masters, K., Nichol, R., Borne, K. D., Edmondson, E. M., Lintott, C., Raddick, J., Schawinski, K., and Wallin, J. (2012). Galaxy zoo: Morphological classification and citizen science. In *Advances in Machine Learning and Data Mining for Astronomy*, pages 213–236.
- Hackman, J. R. (1998). Why teams don't work. *Leader to Leader*, (Winter):24–23.
- Hackman, J. R. (2004). What makes for a great team?
- Hafner, K. (1997). The epic saga of the WELL. *Wired Magazine*.
- Hill, B. M. (2013). Almost wikipedia: What eight early online collaborative encyclopedia projects reveal about the mechanisms of collective action.
- Kraut, R. E. and Resnick, P. (2011). *Building Successful Online Communities: Evidence-Based Social Design*. MIT Press, Cambridge, MA.
- Larkin, B. (2004). Degraded images, distorted sounds: Nigerian video and the infrastructure of piracy. *Public Culture*, 16(2):289–314.

- Lawrence Lessig (2008). *Remix : making art and commerce thrive in the hybrid economy* / Lawrence Lessig. Penguin Press, New York.
- Lessig, L. (2006). *Code: And Other Laws of Cyberspace, Version 2.0*. Basic Books, New York, NY.
- Monroy-Hernández, A., Kiciman, E., boyd, d., and Counts, S. (2012). Narcotweets: Social media in wartime. In *Sixth International AAAI Conference on Weblogs and Social Media*.
- Morgan, J. T., Bouterse, S., Walls, H., and Stierch, S. (2013). Tea and sympathy: crafting positive new user experiences on wikipedia. In *Proceedings of the 2013 conference on Computer supported cooperative work, CSCW '13*, pages 839–848, New York, NY, USA. ACM.
- Obama For America (2013). The obama campaign legacy report. Technical report.
- Olson, M. (1965). *The logic of collective action: public goods and the theory of groups*. Harvard University Press, Cambridge, MA.
- Raymond, E. S. (2001). *The Cathedral & the Bazaar: Musings on Linux and Open Source by an Accidental Revolutionary*. O'Reilly Media, Inc., Sebastopol, CA.
- Reagle, J. (2010). *Good faith collaboration : the culture of Wikipedia*. MIT Press, Cambridge Mass.
- Rosenbaum, R. (1971). Secrets of the little blue box. *Esquire*, (October).
- Shirky, C. (2008). *Here Comes Everybody: The Power of Organizing Without Organizations*. Penguin Press, New York.
- Stallman, R. (1984). The GNU manifesto.
- Stallman, R. (1989). The GNU general public license, version 1.
- Stephenson, N. (1996). Mother earth mother board. *Wired Magazine*, 4(12).
- Taylor, A. (2014). *The people's platform: and other digital delusions*. Metropolitan Books, New York.
- Turner, F. (2005). Where the counterculture met the new economy: The WELL and the origins of virtual community. *Technology and Culture*, 46(3):485–512.
- von Hippel, E. (2005). *Democratizing innovation*. The MIT Press, Cambridge, Massachusetts.