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4. ENGAGING TECHNOLOGY IN UNIVERSITY- COMMUNITY PARTNERSHIPS

ABSTRACT

Despite the growing interest in the concept of an engaged university and the key factors contributing to its successful implementation, sparse attention has been devoted to the role of technology in such endeavors. The present chapter partially fills this gap by focusing on modern communication and information technologies and their application in academic partnerships. Digital technologies have led to profound changes in the patterns of human communication. They have introduced an array of new features such as many-to-many modes of communication, interactivity, asynchronicity, de-massification, user-generated content, and social media convergence. The author considers the implications of these technologies for university-community partnerships, drawing from both communication theory and research, and proposes a model highlighting the dynamic role of technology in partnership activities. It is argued that the latest technological advances enhance the traditional forms of community-campus engagement and create extended opportunities for knowledge sharing and collaboration. The participatory and inclusive nature of new technological tools, particularly social interaction technologies, makes them especially well suited for bottom-up initiatives in areas of innovation and sustainability, technology transfer, local or global connectivity, social capital development, and learning.

INTRODUCTION

In today's globalized world, which is full of challenges and opportunities, American higher education institutions are striving to establish themselves as active contributors to the social, cultural, and economic well-being of communities and society at large. Many universities perform as economic engines (e.g., the University of Chicago, the University of Pennsylvania) and act as anchor institutions (Syracuse University, the University of Pittsburgh) within their surroundings (McGahey and Vey 2008; Coletta 2010). Since the groundbreaking Land-Grant College Act of 1862, partnerships between universities and communities have steadily grown into a source of community revitalization (Fitzgerald et al. 2010; Collaborating for Change 2011). The 1996 Kellogg Commission on the Future of State and Land-Grant Universities once again emphasized the necessity for institutions of higher learning to be relevant to society and engage the world in meaningful ways (McDowell 2003). A vibrant field of knowledge associated with community engagement emerged, both in the

United States and beyond, with an ever-increasing volume of contributions from a variety of disciplines ranging from education, sociology, psychology, communication, political science, urban development, social work, e-governance, and community informatics, to name a few.¹ As a manifestation of this growing trend, Sage Publications have released a 950-page *Handbook of Community Practice* edited by Maric Weil, Michael S. Reisch, and Mary L. Ohmer (2013).

Previous studies of campus-community partnerships focused on civic engagement (Ostrander 2004; Soska and Butterfield 2005); universities' civic mission (Checkoway 2001; Cuthill 2012), and societal impact (Hall & MacPherson 2011; Vidal et al. 2002); principles of research-based partnerships (Fitzgerald, Allen, and Roberts, 2010; Silka 2006); and strategies for positive change (Bowdon and Carpenter 2011; Thompson and Emmanuel 2012). The characteristics of effective partnerships (McNall et al. 2009) along with barriers to university-community collaborations (Cherry and Shefner 2004; Nyden et al. 1997), as well as the emergence of community-university partnerships internationally (Office of Community-Based Research 2009; Watson et al. 2013) have been thoroughly examined.

Despite growing interest in the concept of an engaged university and the key factors contributing to successful university-community partnerships (McDowell 2003; Watson et al. 2013), sparse attention has been given to the role of technology in such endeavors. The current chapter addresses this gap by focusing on digital technologies and the way they can be used in community engagement activities. The author considers the implications of new communication technologies for partnership activities, drawing from both communication theory and research, and identifies the characteristics of digital technologies that are most relevant: interactivity, asynchronicity, and de-massification. Social interaction technologies (Dumova and Fiordo 2010) and best practices in their employment in university-community partnerships are examined. The chapter concludes with a model highlighting the dynamic role of social interaction technologies in academic-community partnerships and identifies a direction for further research.

TECHNOLOGY, COMMUNITY ACCESS, AND CITIZEN ENGAGEMENT

Technology is often characterized as the tools and techniques produced by a society to meet people's needs. As such, technology functions as the practical application of human knowledge designed to solve a problem, serve a purpose, or improve an existing condition. Communication technologies can be viewed as the tools people use to expand their communication capabilities "beyond naturally endowed" (Williams et al. 1988, p. 3). Recently, these tools have evolved from analog technologies like radio, television, and film to digital technologies: computers, tablets, smartphones, touch screen displays, gesture control systems, and many others. The progress in digital communication technology has also brought about an unintended shift. Due to the widespread adoption of electronic devices, both stationary and handheld, the information retrieval function was taken over by the function of social interaction. Social interaction technologies can be

defined as “an assortment of Internet-based tools and techniques aimed at initiating, maintaining, sharing, and distributing interactive and collaborative activities and spaces” (Dumova and Fiordo 2010, p. xl). These technologies, commonly referred to as Web 2.0, include an assortment of platforms and applications such as social networks (Facebook, Google+), blogs (WordPress, Blogger), microblogs (Twitter, Tumblr), photo and video sharing (Flickr, Instagram, YouTube, Pinterest), discussion forums, audio and video podcasts, instant messages, RSS feeds, social bookmarking services, and virtual worlds. As technology continues to evolve and becomes more affordable, the shift from information transmission and retrieval towards interaction, collaboration, and sharing becomes more visible.

Among the variety of existing perspectives on the role of communication technology in society, three approaches seem to be most relevant to the study of academic-community partnerships, namely: (a) communication technology as an agent of social change, (b) community informatics, and (c) the sociotechnical approach. Each approach has produced valuable conceptualizations and has been applied in empirical research. A substantial body of scholarship focused on communication technology and social change has been accumulated.² This literature emphasizes the constructive potential of Internet technology in society. Particularly, a number of investigations have examined the effects of the Internet on citizen engagement. Despite a degree of skepticism regarding the effectiveness of new tools (see Chadwick 2003, 2006; Norris 2000), the role of new media technologies has been acknowledged as a stimulant for political and civic participation. According to a study by the Pew Internet & American Life Project, online users who employ Facebook, Twitter, YouTube, and other social media channels for political and civic purposes are 96 percent more likely to participate in offline civic activities than other Internet users (Rainie 2011, p. 2). An earlier Pew Research Center’s analysis found that 56 percent of respondents involved in a political or community group communicated with other group members through email or group websites and about 10 percent used instant messaging (Smith et al. 2009, p. 9). Research applying the social change perspective also showed that the Internet and social media create new opportunities for the social engagement of youth (e.g., Bennett 2008; Jenkins 2009; Rheingold 2008).

A second view stems from the field of community informatics (CI), a newly emerged interdisciplinary area of knowledge concerned with the application of technology in a community setting.³ As an area of research and practice, CI links the social, political, financial, and cultural developments of communities with the advancements in information and communication technologies (ICT) and aims at “furthering the well being and welfare of a community through the development and use of ICT” as its goal (Pierson 2000, p. 252). From a CI perspective, various digital technologies can foster community participation and support local economies. In the 1990s, the focus of CI research was largely on technology access and early Internet applications such as bulletin board systems (BBS), Usenet news electronic discussion lists, multi-user dungeons (MUDs), community websites, as well as community technology centers (often called Telecenters).

Studying the use of ICT for community practice brought several important concepts to the forefront that are of value for both academics and practitioners engaged in university-community collaborations, particularly, community access and digital divide. The notion of community access initially dealt with technical access, involving issues related to low-cost or free public access to the Internet, broadband (bandwidth capacity), hardware and software installation, maintenance, and the like (Gurstein 2000, p. 5). In the 1990s, even providing an Internet connection for a community access center could become a serious problem. Along with public libraries, universities were often the sites for such facilities. However, it became evident that community access involved more than simply providing access to technology. It entailed solving a range of organizational, financial, and human issues necessary for the successful bridging of technology and communities. The concept of digital divide suggests that there is a division between how different segments of society⁴ access ICT (Zickuhr and Smith 2012). Because of Internet growth, the rise of mobile connectivity, and the wide adoption of Web 2.0 applications, the concept of digital divide has evolved to embrace not only differences in Internet access (such as high-speed connections or wireless broadband services), but also in digital media literacy including “the ability to read, write, and interact across a range of platforms, tools, and media” (Thomas et al. 2007).

A third view, the sociotechnical approach, capitalizes on the technology and social change perspective but differs from the latter in focusing on technology’s attributes, functions, and benefits that it brings to the dynamics of communication between constituents (e.g., Lin and Atkin 2007; Metzger 2009). For example, research which concentrated on the use of ICT in public sector interactions, digital citizenship⁵ (Mossberger et al. 2010), e-governance⁶ (Milakovich 2011), and the transformative impact of Web 2.0 technologies on the relationship between stakeholders (Mergel et al. 2009; Osimo 2008) can be cited. Another useful feature of the sociotechnical approach is its emphasis on the social contexts of communication (e.g., Lievrouw 2009; Rice 2009; Rogers 2003). By examining a complex mix of evolving digital technologies and societal contexts, it is possible to enhance the understanding of the uses of communication technology in community partnership initiatives and more accurately evaluate their benefits and potential challenges.

Consistent with the sociotechnical approach, the new tools were conceptualized as computer-mediated social interaction technologies (Caplan et al. 2007, p. 50). The need “to adapt communication theories to evolving technologies and changing contexts in order to understand the uses and effects of computer-mediated social interaction technologies” (p. 51) has also been emphasized. In this context, the study of social interaction technologies is currently emerging as a subfield of computer-mediated communication. With advances in digital technologies, the unidirectional one-to-many modes that have previously utilized the Internet merely as a distribution channel started to give way to many-to-many communication systems with an unprecedented level of interactivity as well as asynchronicity and de-massification. The overall proliferation of digital technologies resulted in an

array of new features and processes such as user-generated content, knowledge sharing, collaboration, customization, and personalization. The particular implications of the latest communication technology trends for partnerships between universities and communities are addressed below in more detail.

INTERACTIVITY

The notion of interactivity is central to understanding the nature and characteristics of digital technologies that are increasingly utilized in university-community. The term interactivity has been used since the 1980s to refer to human communication based on dialog and exchange (Lister et al. 2009). It was noted that not all computer communication is interactive as, in fact, is true with regular face-to-face communication because “human response implies listening, attentiveness, and intelligence in responding to a previous message exchange” (Rogers 1986, p. 5). In this context, interactivity was viewed as the capacity of new communication systems to “talk back” to the user (p. 4). Communication behavior based on interactivity was expected to be more accurate, more effective, and more satisfying to the participants in a communication process, and interactivity was therefore considered a desired quality of communication systems.⁷ Since the wide adoption of the Internet in the 1990s and with the following explosion of a second generation of web-based tools and service-oriented applications, or Web 2.0, interactivity came to the forefront of scholarly discussions in the field of communication and related disciplines. Interactivity has been understood as “the condition of communication in which simultaneous and continuous exchanges occur,” while these exchanges are viewed as carrying “a social, binding force” (Rafaeli and Sudweeks 1997). Although it has been acknowledged that interactivity is an inherent property of new technologies (e.g., Jenkins 2006; Metzger 2009), the question of the degree to which computer-based, technology-mediated communication can resemble or enhance human interaction remains unanswered.

User-Generated Content

The explosion of user-generated or user-contributed content is of particular significance to academic-university collaborations. User-generated content is disseminated in a variety of forms via an array of digital platforms: photo and video hosting sites, blogs, podcasts, wikis, mashups, feedback allowing websites, and social networks like Facebook. Research suggests that universities can help communities bring their voice into regional media by utilizing their resources and skills to develop an infrastructure for community involvement. Web 2.0 technologies “offer a potentially strong vehicle for such ‘bottom up’ influence in neighborhoods and communities in the United States and around the world,” concludes Leo W. Jeffres (2007, p. 128), analyzing early evidence of the Internet’s facilitating impact on community engagement. The different content types that can strengthen community identity and community ties include blog posts and

comments, user-created digital videos, product ratings, user tags, social bookmarks, and reader-contributed news.

The phenomenon of participatory news, also described as “community journalism,” “civic journalism,” “citizen journalism,” “grassroots journalism,” “open source journalism,” “do-it-yourself reporting,” or “networked journalism” allows community members to write their own news and create content such as photo galleries, blogs, wikis, and local events calendars. Howard Rheingold (2008, p. 112) identified four forms of citizen journalism, namely: reporting news (such as eyewitnesses’ accounts of crises events), investigative blogging (e.g., those that address political incidents), hyperlocal journalism (covering local meetings or sporting events), and digital storytelling (narrated oral histories or interviews supported with photos, audio, and video).

In Rockhampton, Australia, for instance, a collaboration between the University of Queensland’s information technology students and journalism students at the central Queensland University resulted in an innovative E-News project, which provided the opportunity for grassroots journalism through a community news website (Simpson et al. 2004). The E-News system allowed community members to contribute news stories online and in real-time, with university students serving as web designers and editors. The program stimulated two-way interactions between the participants by bringing “journalism to the community” and “community to journalism” (p. 262) as it expanded the scope of traditional journalism to include informed members of the community, and encouraged readers to participate in community discourse.

For many people, the passive process of receiving the news is increasingly becoming an active, social experience. As a result, “a more interactive, dialogical or participatory style of newswork is currently very much ‘under construction’... and that more or less traditional makers and users of news are cautiously embracing its potential,” note Mark Deuze, Axel Bruns, and Christoph Neuberger (2007) in a study of participatory news production practices in the Netherlands, Germany, Australia, and the United States. The authors identify a variety of approaches in “re-connecting journalism with the citizenry” designed to produce a “co-creative, commons-based news platform” (p. 325). One such model is Skoeps.nl, the first Dutch participatory platform for regional and national news, which integrates user-generated multimedia content (such as photos and videos taken with camera-equipped cell phones) in partnership with the Utrecht School of Journalism⁸ and 1,000 registered citizen reporters (p. 327).

One of the challenges of initiatives like E-News or Skoeps lies in their sustainability. The ability of technology to act as a catalyst for community involvement depends to a large degree upon the existing capacity of the local community (Simpson et al. 2004). Besides, citizen journalism remains dependent on traditional news organizations (Deuze et al. 2007) often serving as an extension of newspaper publishers or commercial broadcasters. To meet these challenges and capitalize on the new opportunities brought about by the developments of Web 2.0 technologies, many universities have begun to integrate citizen journalism into their curricula. J-Lab: The Institute for Interactive Journalism⁹ lists 77 news sites

across the United States that are created, hosted, and maintained by universities and populated with student-contributed content.¹⁰ For example, CU-CitizenAccess.org, a website maintained by the Journalism Department of the College of Media at the University of Illinois at Urbana-Champaign, started as a partnership between the University of Illinois, Illinois Public Media in Urbana, The News-Gazette in Champaign, and a Spanish-language newspaper, Hoy Chicago, with support from the Marajen Stevick Foundation and the Knight Foundation. The report published by J-Lab, *The Classroom as Newsroom: Leveraging University Resources for Public Affairs Reporting* (Francisco et al. 2012), presents an overview of the variety of services provided by university-sponsored news sites. These models do not replicate traditional media organizations, according to the report, but rather explore “the astonishing possibilities of the new informational world” (p. 2696). Besides local news, student-run sites offer audio or video reports, reporters’ blogs, weekly newsletters, maps, infographics, and free mobile application gadgets like “Failed Restaurant Inspections in Urbana-Champaign.”¹¹

Knowledge Sharing

When exploring the potential role of digital communication technology in campus-community partnerships, it is essential to consider the new opportunities that have emerged for the dissemination of knowledge and innovative ideas. In addition to acting as catalysts for community engagement, universities can play a leading role in stimulating new ideas, encouraging innovation, providing resources, and thus performing as anchor institutions that “at their best have the opportunity to energize an entire city” (Coletta 2010, p. 377). For example, the dissemination of knowledge or technology transfer is a critical component of many universities’ missions. Sharing knowledge, information, skills, and technologies can take many forms and occurs at different levels, ranging from local organizations, companies, and governmental agencies to individuals. The range of technologies available for transfer into the marketplace includes engineering technology, physical science technology, nanotechnology, medical technology, and other specialized technologies that meet societal needs.

For universities, communication technologies play an important role in building relationships with potential partners in technology transfer initiatives. An extensive online and social media presence can be achieved through web portals, RSS feeds, real-time updates, and the use of social networking sites like Facebook and Twitter, which would help universities enrich their daily communications and establish connections with technology transfer partner agencies. Through technology, universities disseminate much needed information related to intellectual property rights protection, patents, and licensing, as well as information about opportunities for industry-university collaborations. At Pennsylvania State University, for instance, emphasis is on new inventions and their potential to translate promising research ideas and discoveries successfully into products and services for the benefit of the local community and larger society. The university offers funding opportunities and business development support to startups,

provides an infrastructure for industry-sponsored research, develops collaborative industry-university educational and training programs (including online training), and helps graduating students enter the workforce in the region. Technology transfer programs at Carnegie Mellon University contribute to industrial innovation and spur local economic growth through licensing, sponsored research, and new venture agreements.

In addition to encouraging innovation and stimulating local economic activity, universities can help address the specific challenges facing local communities by utilizing technology. Working to improve the recruitment and retention of educated workforce in the region, for instance, is another role that universities can play in the revitalization of their immediate neighborhoods, as can be seen in the example of Campus Philly (Coletta 2010). Campus Philly, a nonprofit organization that, according to its mission, “fuels economic growth by encouraging college students to study, explore, live and work in the Greater Philadelphia tri-state region.”¹² Based on a partnership between 26 colleges and universities,¹³ regional businesses, and nonprofits, Campus Philly seeks to further student attachment to Philadelphia as a place not only to go to school, but also to live and work after graduation. An interactive website, campusphilly.org, e-newsletter, and social networking groups on Facebook and Twitter connect college graduates with local internship opportunities and regional employers, offers information about dozens of on-campus events, cultural life of the city, volunteer sites, and other civic engagement activities. Among the new programs are Campus Philly Crawl, which introduces students to technology start-ups in the Greater Philadelphia region, and the Networking Lab for students in the fields of science, technology, engineering, and mathematics.

Some scholars contend that the use of social interaction technologies for engaging two-way interactions with the public, such as interactions between policy-makers and their constituents, can be hindered by local governments' and regional agencies' ability to implement new technologies to their full potential. A study by Cliff Lampe and colleagues (2011) describes a public outreach social media campaign, AdvanceMichigan, aimed to collect feedback from key stakeholders of a statewide policy and service agency, Michigan State University Extension (MSUE).¹⁴ With the help of Michigan State University and partner agents from the government, financial, and legal sectors, MSUE provides a wide range of public services and targeted programs for the residents of Michigan communities. Between May and June of 2010, an interactive website offered multiple ways for community members to interact with the agency: submit ideas, vote on local projects, provide comments, and participate in discussions. To recruit and engage citizen participation, the campaign utilized Twitter and Facebook. Although 900 people registered with the site and made 561 unique comments, the campaign was not able to reach the projected scope and produce large-scale grassroots interactions due to a number of confines imposed by social and technical dependencies as well as specific task limitations (Lampe et al. 2011, pp. 5, 14).

ASYNCHRONICITY

Another valuable feature of new communication technologies that should be taken into account when planning community partnership activities is asynchronicity or their time-shifting ability. Communication scholars (Rogers 1986; Williams et al. 1988) have ascertained that digital communication systems' capability to send and receive messages at a time convenient for an individual implies a major change in the communication process. As such, asynchronicity offers a new level of control over message exchange, allowing users to overcome time as a barrier for interaction. The asynchronous nature of many Web 2.0 applications makes them especially useful for two-way interactions and bottom-up initiatives. Participatory community news sites and collaborative news productions, discussed earlier in this chapter, are among the most widespread applications of asynchronous technologies at the local community level. In addition, synchronous (real-time) tools like virtual conferencing platforms, live chat, text messaging, live blogging, and real-time data distribution can "enable broader, faster, and lower cost coordination of activities" (Rheingold 2008, p. 100) between community partners and other interested parties. Photo or video sharing and social networking services such as Flickr, Instagram, Pinterest, YouTube, Facebook, and Twitter, offer new ways to disseminate information, raise funds, promote civic engagement, and enhance citizen participation.

Technological Convergence

Among the most promising aspects of digital communication technology for academic partnerships is convergence or the ability to blur the boundaries between previously discrete media forms. As Miriam J. Metzger (2009) explains, media convergence happens because of digitization and other features associated with digital technologies: video compression, broadband, and multimedia. Technological convergence is the integration of multiple technologies and processes meant to enable technological innovations, produce better content, and disseminate content more effectively. From a user perspective, the interconnectedness of technological mechanisms provides new levels of engagement with mediated realities. The proliferation of mobile platforms made it apparent that convergence ultimately blurs the boundaries between traditional media formats such as text, images, audio, and video allowing them to flow across platforms and distribution channels (Jenkins 2001; 2006). Users are mastering the attributes of new technologies "to bring the flow of media more fully under their control and to interact (and co-create) with others" (Jenkins and Deuze 2008, p. 6). A most recent development is the growing degree of overlap between different social media, which results in the convergence of individual social media platforms and tools. The phenomenon of social media convergence considerably expands their functionality and facilitates two-way interactions between content producers and consumers (Dumova 2012).

The following example demonstrates the transforming role of new communication technologies in partnership programs that involve communities

and educational institutions around the world. I'm a City Changer¹⁵ is a global movement aimed to create better cities by sensitizing and raising awareness about challenging twenty-first century urban issues among citizens.¹⁶ To share best practices in improving city life in their local areas, the campaign encourages citizens to upload photos using an Instagram application, tag them with #imacitychanger, and continue the conversation on Twitter and Facebook networks. With support from the United Nations Human Settlements Program (UN-HABITAT), this worldwide campaign serves as an online platform and communication tool for a global discussion between community-based organizations, academic institutions, the private sector, and local governments on issues of urban development and sustainability. According to a press release issued by the United Nations Human Settlements Program:

I'm A City Changer presents a change in the urban paradigm. It aims to convey to every city decision-maker the potential in changes in urban strategies and policies, and encourages citizens to adopt new attitudes towards life style and consumption.¹⁷

Some of the featured cities are Paris, Marseille,¹⁸ Berlin, New York, Vancouver, Nairobi, Kathmandu, Rio de Janeiro, Medellin, Sao Paulo, Belo Horizonte, and Porto Alegre. Among the academic partners is the University of Pennsylvania's Penn Institute for Urban Research (Penn IUR). Through partnerships with urban practitioners and policy makers, Penn IUR examines local and global innovations and disseminates its research worldwide. It focuses on national and international urban issues in three areas: fostering innovative urban development strategies, building a sustainable and inclusive twenty-first century city, and illuminating the role of anchor institutions in urban places.¹⁹

Another initiative, the Not For Sale campaign, combines modern technology, social capital, and a growing network of grassroots volunteers across the globe joined together to put an end to modern slavery, according to David Batstone.²⁰ Batstone is a professor of business and social responsibility at the University of San Francisco and co-founder and president of the California based non-profit organization, which aims to end human trafficking. Not For Sale runs awareness campaigns and holds events to raise money to help victims of human trafficking.²¹ It also directs student abolitionist movement chapters and local outreach branches of community abolitionist networks in the United States and Canada. In partnership with Mxit, the largest social networking service in Africa, and the International Labor Rights Forum, the organization released a free mobile app for iPhone and Android. The Free2Work app²² is a free and user-friendly reference guide with a built-in barcode scanner. Consumers can scan the barcode of a specific product while they shop and instantly obtain information on the labor standards of the company that manufactures the product. SlaveryMap.org is another tool developed to report incidents and record documented cases of human trafficking on an interactive map. During July-September 2012, the Not For Sale organization helped 927 survivors in Thailand, Peru, the Netherlands, Romania,

South Africa, and India by offering shelter, legal services, life skills training, job placement, and assisting with different aspects of their rehabilitation.²³

DE-MASSIFICATION

Digital technologies have a number of distinctive properties, which can be pivotal for building successful university-community partnerships, including the highly individualized nature of new media or their de-massification. The term de-massification refers to the degree to which a message can be exchanged with each individual in a large audience (Williams et al. 1988). Everett M. Rogers (1986) was among the first to observe that with de-massification the control of mass communication systems “moves from the message producer to the media consumer” (p. 5). Rheingold (2008) has emphasized that the emergence of the many-to-many communication modes makes it possible for anyone connected to the Internet “to broadcast as well as receive text, images, audio, video, software, data, discussions, transactions, computations, tags, or links.” The value of participatory media, Rheingold explains, originates in the active involvement of many people and derives “from their power to link to each other, to form a public as well as a market” (p. 100). Some call the phenomenon “produsage” (Bruns 2009), referring to the combined roles of the participants as both producers and users of content. Other scholars (e.g., Jensen and Helles 2011) believe that the future of many-to-many communication across different groups, institutions, and sectors in society is still taking shape. Therefore, the specific potentials of the many-to-many forms of communication for partnerships should be evaluated over time and in perspective.

Collaboration

The abundance of digital communication tools, in a variety of formats like digital video, audio podcasts, RSS feeds, imagery, mobile apps, web widgets, data visualizations) is creating new opportunities for collaboration and instigating important changes in the traditional relationship between partnership participants. It is common for campus-community partnerships that have been successful in fostering civic engagement through technological innovations to originate in the business sector and for community-based organizations to initiate collaborations with public sector agencies and universities. As the following example suggests, new models of university-community partnerships emerge in which the traditional relationship between universities and communities changes and community-based commercial enterprise performs as a key partner.

SeeClickFix²⁴ is one such example of a business-sector driven and technology-enabled partnership that benefits communities and neighborhoods. The company offers a dashboard that allows anyone with Internet access to report and monitor

non-emergency problems in a community or neighborhood using the SeeClickFix website or a free mobile phone app. Users do not need to register on the website to file a report. A web widget applies user-submitted information to an interactive Google map freely available on the website. In this model, the private sector provides a platform for collecting crowdsourced local problem reports and directs them to local government authorities. Visitors to the site can view all reported issues, sort them by date, rank, make comments, and track their status. According to the Knight Digital Media Center at the University of Southern California, over 100 municipal and county governments and several universities have used the service offered by this New Haven based startup.²⁵ Yale University and Southern Connecticut State University are among them. Through collaboration with SeeClickFix, students, faculty, and staff at both universities can report campus safety issues, create watch areas, and follow the status of their service requests online.

Fab Lab Barcelona of the Institute for Advanced Architecture of Catalonia,²⁶ in cooperation with the Hangar centre for visual arts and Goteo social network, developed another participatory platform, Smart Citizen,²⁷ to capture and share real-time data regarding air and noise pollution in Barcelona. Currently in its first stage,²⁸ this joint project brings together research expertise, the collective intelligence of city inhabitants, hardware (free urban sensor kit, which measures air and light quality, temperature, sound, and humidity), geolocation technology, and online social networking to promote environmental values and sustainable practices in the city. The purpose of this citizen-driven innovation is to take advantage of the new ways to connect people and data by optimizing the relationship between social capital, community resources, and technology in an urban environment.

It should be noted that the need for harnessing technological advances in collaboration and knowledge sharing can be drastically amplified in times of crises.²⁹ On 12 January 2010, an earthquake of catastrophic magnitude hit Haiti. The earthquake produced a massive tsunami killing over 250,000 people and injuring 300,000. The earthquake became one of the deadliest in human history, and 3.5 million people were affected by the disaster. In the quake's aftermath thousands of volunteers from all over the world worked together with international humanitarian organizations in affected Haitian communities to assist rescue workers in helping survivors on location, through fundraising efforts, by providing equipment and product donations, or by sharing knowledge and skills, both within and outside of the crisis region. To aid emergency response efforts, students from the Tufts University Fletcher School of Law and Diplomacy formed a crisis-mapping group a few days after the Haiti earthquake. The Ushahidi Haiti Project³⁰ collected citizen-generated information obtained from social media channels (Twitter, Facebook, Skype, and Flickr) and the 4636 Alliance³¹ compiled summary reports and directed them to the appropriate relief agencies in Haiti. Through this project, which included 200 volunteers, Tufts students helped with translating text messages, identifying global positioning system (GPS) coordinates, mapping geospatial data, and integrating global/local data sets (see Norheim-Hagtun and

Meier 2010; Harvard Humanitarian Initiative 2011; Lambert and Carlson 2011). Another group of science and engineering students at the University of Colorado at Boulder, in collaboration with Project EPIC,³² developed a standardized Twitter syntax for sharing disaster related information using a series of hashtags and abbreviated vocabulary (see Bryen 2010; Lardinos 2010). New forms of volunteering have also emerged, including microvolunteering, a merger of virtual volunteering and crowdsourcing in which volunteers undertake specific microtasks³³ such as mapping tent camps and hospitals by using their portable cameras, laptops, and GPS receivers.

Future Challenges: Customization and Personalization

When developing academic-community partnership initiatives, it is important to both maximize the potential benefits and address the challenges that come with technology integration. Along with an increased level of control over the flow of communication messages and enhanced opportunities for knowledge sharing and collaboration, these new modes of communication enabled by digital technologies allow for greater customization and personalization of user experiences. In light of these developments, two innovative approaches hold significant promise for the future of technology-driven partnerships between universities and communities: (a) the idea of data (such as open data, “big data,” data analytics, real-time data) as an innovation driver and (b) innovation clusters. These initiatives aim to accelerate innovation through cross-functional public-private sector partnerships (Anderson and Rainee 2012; Culatta 2012). A public-private partnership allows a university to attain the benefits of having access to third party resources, reduce costs, and increase the efficiency of projects and services.

For example, according to Richard Culatta (2012), by following a model already applied in health care,³⁴ open data find their way into the field of education. The U.S. Department of Education website, data.gov/education, provides access to databases and high-value data sets, educational statistics, geospatial data, and numerous resources gathered from federal and non-governmental agencies, data archives, and catalogs.³⁵ The website serves as a central clearinghouse for educational data and contains datasets in various formats such as survey reports, assessment tools, apps created from open data, grant visualizations, and more. It also offers different ways to engage with the data: search and data extraction APIs, RSS feeds, web-based widgets, and an interface to submit data sets or requests. The challenge is to leverage the “big data” that comes from the public domain, university-adopted learning management systems, and social media channels for the benefit of learners, educational institutions, and larger communities.

In one promising development, students and faculty at the New York Law School are engaged in an open organizational data project, OrgPedia,³⁶ which utilizes the untapped potential of open data. They use open government data, including securities and patent filings, environmental, and workplace safety records, and the *New York Times* financial dataset to develop a free, not-for-profit online directory of public and private companies, both domestic and international.

A different project, “NYCVolunteers,” an undertaking of NYC Service,³⁷ is a free iPhone and Android app, which employs the Federal Volunteer Opportunities dataset available through data.gov and helps New York City residents locate nearby volunteering sites. With their phones, users can view the site location on the map, share it with friends on Facebook and Twitter, or find more information through the NYCServise.org online portal.³⁸

Technology also plays an important part in another emerging approach. This approach includes *innovation clusters* or “regional concentrations of interconnected companies, service providers, and associated institutions that enjoy unusual competitive success in a particular field” (cited in Culatta 2012, p. 27). Innovation clusters have already been created in Los Angeles, Phoenix, St. Louis, Pittsburgh, and other “forward-leaning regions” (p. 28) across the United States. In the Greater Pittsburgh Region, civic leaders, higher education administrators, representatives from technology and media industries, cultural institutions, local philanthropic organizations, and child serving agencies have formed a partnership with educators and administrators of public, private, charter, and virtual school systems to form the Education Innovation Cluster. Pittsburgh’s innovation cluster defines itself as “a collaborative, creative, and connected learning ecosystem” (Coon 2012). According to Ryan Coon, partners have identified five key sectors: (a) formal and informal learning environments, (b) innovation research and development, (c) learning research and scholarship, (d) entrepreneurial support and commercial interest, and (e) strategic stewardship. The underlying idea is that sustainable educational innovations can be developed at points where these sectors intersect.

As such, Pittsburgh’s Education Innovation Cluster “designs and implements projects, programs, and activities that make engaging use of technology and digital tools” (Coon 2012). The goal is to help children and adolescents discover their talents by connecting individual interests with learning in the classroom and beyond. For instance, the Entertainment Technology Center at Carnegie Mellon University, educational gaming company Zulama, and the Elizabeth Forward School District started the Entertainment Technology Academy where students explore and design video games. The University of Pittsburgh Center for Learning in Out-of-School Environments joined Carnegie Mellon University’s Entertainment Technology Center to develop a technology exploration space, MAKESHOP, at the Children’s Museum of Pittsburgh. The CREATE Lab at Carnegie Mellon University partnered with the Carnegie Museum of Natural History and the Pittsburgh Parks Conservancy in a STEM learning project that makes use of virtual tools like the Digital Discovery Room for nature explorations. Overall, the Education Innovation Cluster in Pittsburgh unites the efforts of 60 organizations and more than 100 active participants (Coon 2012).

CONCLUSION

Recent decades have seen an immense expansion in Internet adoption, broadband connectivity, mobile computing, and the associated economic, social, and cultural

changes. An industry report³⁹ measuring the impact of Internet technologies by the McKinsey Global Institute (2011) concluded that the Internet is an indispensable part of the global economy, society, and culture, and the way to move forward involves engaging new technologies. This finding goes in line with the results of a poll conducted by the Pew Internet & American Life Project indicating that the Internet has become “part of the fabric of everyday civic life” (Smith et al. 2009, p. 9). Therefore, to be successful in today’s digital age, academic partnerships should capitalize on the vast potential of available communication tools. This chapter has reviewed a body of theoretical and empirical work in the field of communication and related disciplines with an emphasis on the role of digital communication technologies in university-community collaborations.

Advances in digital technologies have led to profound transformations in the long established patterns of human communication. A move away from unidirectional one-to-many modes that have previously used the Internet merely as a distribution channel to many-to-many communication systems is evidenced in a variety of new features and a new level of user control over message exchange. Consequently, the emphasis shifts from simple information transmission and retrieval to social interaction, collaboration, and sharing. As new technologies begin to stimulate innovation and local economic activity, they also create imperatives for being integrated in partnerships between universities and communities. Historically, many higher education institutions have performed the role of anchor institutions providing knowledge, expertise, and leadership in the revitalization of their surrounding communities. Additionally, new models of academic-community partnerships emerge in which community-based commercial enterprise assume an increasingly active role. Based on the preceding review of best practices of engaged universities in integrating technological advances, the model presented in this chapter highlights the implications of the latest technology trends for university and community partnerships (see Figure 4.1).

The model in Figure 4.1 contains elements abstracted from both communication theory and empirical research. It places emphasis on the inherent properties of social interaction technologies—interactivity, asynchronicity, and de-massification—and focuses on such features as user-generated content, technological convergence, customization, and personalization. The model is designed to assist in realizing the constructive potential of technology in university-community partnerships and similar community engagement initiatives. It may also help with developing long-term strategies for positive change in support of universities’ mission as key contributors to the social and economic well-being of their communities.

The distinctive aspects of today’s communication technologies, particularly social interaction technologies, can help overcome barriers for interaction between stakeholders, enhance traditional forms of community-campus engagement, and create extended opportunities for collaboration and knowledge sharing at both the local and global scale. An assortment of Internet applications and services exist to help disseminate knowledge and information, raise awareness, foster social

connections in communities, and promote the involvement of community members in public life.

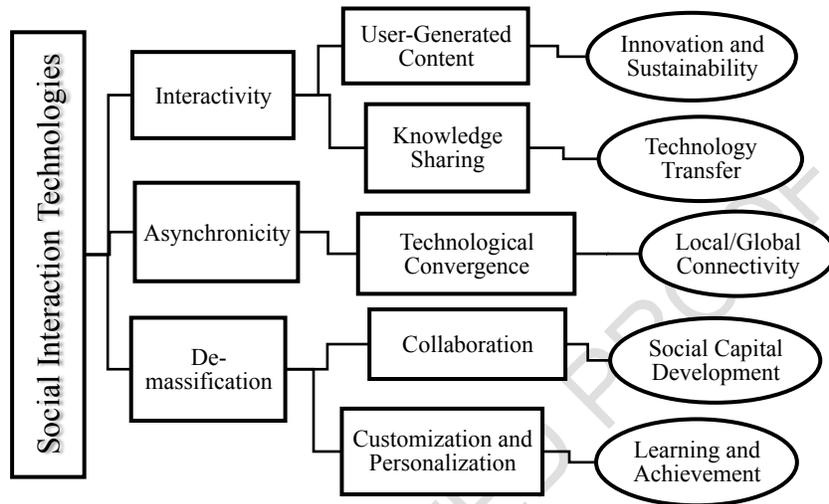


Figure 4.1. Technology Dynamics in University-Community Partnerships

By utilizing technology, universities can also address some of the pressing challenges facing local communities such as accessing resources, preventing crime, or creating educational and training opportunities. The participatory nature of social interaction technologies makes them especially well suited for bottom-up initiatives in areas of innovation and sustainability, technology transfer, and local or global connectivity. Mobile communications, location-based technologies, “big data,” and most recently cloud computing hold both great promises and challenges for the society of tomorrow. As new technologies continue to permeate people’s lives, more research is needed to re-evaluate technology’s place in university-community relationships and examine how new technological tools can be used to their full potential.

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REFERENCES

Anderson, Janna Q., & Lee Rainie. (2010). *Big Data: Experts Say New Forms of Information Analysis Will Help People Be More Nimble and Adaptive, but Worry over Humans’ Capacity to Understand*

- and *Use These New Tools Well*. Washington, DC: Pew Research Center's Internet & American Life Project. Available online at: <http://pewinternet.org/Reports/2012/Future-of-Big-Data.aspx>.
- Bennett, W. Lance, ed. (2006). *Civic Life Online: Learning How Digital Media Can Engage Youth*, The John D. and Catherine T. MacArthur Foundation Series on Digital Media and Learning. Cambridge, MA: MIT Press.
- Bowdon, Melody A., & Russell G. Carpenter, eds. (2011). *Higher Education, Emerging Technologies, and Community Partnerships Concepts, Models and Practices*. Hershey, PA: IGI Global.
- Bruns, Axel. 2008. *Blogs, Wikipedia, Second Life, and Beyond: From Production to Prodsusage*. New York: Peter Lang.
- Bryen, Whitney. (2010). "CU-Boulder Grad Student Improves Haiti Communication through Twitter." *Colorado Daily*, January 20. Available online at: http://www.coloradodaily.com/ci_14233164#axzz2M12YzKa3.
- Caplan, Scott E., Elizabeth M. Perse, & Janice E. Gennaria. (2007). "Computer-Mediated Technology and Social Interaction." In Carolyn A. Lin and David J. Atkin (Eds.), *Communication Technology and Social Change: Theory and Implications* (pp. 39-57). Mahwah, NJ: Lawrence Erlbaum Associates.
- Carnegie Foundation for the Advancement of Teaching. (2010). *Classification Description: Community Engagement Elective Classification*. Washington, DC: Carnegie Foundation for the Advancement of Teaching. Available online at: http://classifications.carnegiefoundation.org/descriptions/community_engagement.php.
- Chadwick, Andrew. (2003). "Bringing E-Democracy Back In: Why It Matters for Future Research on E-Governance." *Social Science Computer Review*, 21(4), 443-455.
- Chadwick, Andrew. (2006). *Internet Politics: States, Citizens, and New Communication Technologies*. New York: Oxford University Press.
- Chadwick, Andrew, & Philip N. Howard, eds. (2008). *Routledge Handbook of Internet Politics*. New York: Routledge.
- Checkoway, Barry. (2001). "Renewing the Civic Mission of the American Research University." *The Journal of Higher Education*, 72(2), 125-147.
- Cherry, Donna J., & Jon Shefner. (2004). "Addressing Barriers to University-Community Collaboration: Organizing by Experts or Organizing the Experts?" *Journal of Community Practice*, 12(3/4), 219-233.
- Coletta, Carol. (2010). "CEOs for Cities: Engaged Scholarship for Urban Development." In Hiram E. Fitzgerald, Cathy Burack, and Sarena D. Seifer (Eds.), *Handbook of Engaged Scholarship: Contemporary Landscapes, Future Directions* (pp. 373-380). Vol. 2. East Lansing, MI: Michigan State University Press.
- Coon, Ryan. (2012). "Pittsburgh: Forging a 21st Century Learning Community." *EDUCAUSE Review*, 47(6). Available online at: <http://www.educause.edu/ero/article/pittsburgh-forging-21st-century-learning-community>.
- Culatta, Richard. (2012). "From Innovation Clusters to Datapalooza: Accelerating Innovation in Educational Technology." *EDUCAUSE Review*, 47(6), 25-34.
- Cuthill, Michael. (2012). "A 'Civic Mission' for the University: Engaged Scholarship and Community-Based Participatory Research." In Lorraine McIlrath, Ann Lyons, and Ronaldo Munck (Eds.), *Higher Education and Civic Engagement: Comparative Perspectives* (pp. 81-100). New York: Palgrave Macmillan.
- Deuze, Mark, Axel Bruns, & Christoph Neuberger. (2007). "Preparing for an Age of Participatory News." *Journalism Practice*, 1(3), 322-338.
- Dumova, Tatyana. (2012). "Social Interaction Technologies and the Future of Blogging." In Tatyana Dumova and Richard Fiordo (Eds.), *Bloggging in the Global Society: Cultural, Political and Geographical Aspects* (pp. 249-274). Hershey, PA: Information Science Reference.
- Dumova, Tatyana, & Richard Fiordo, eds. (2010). *Handbook of Research on Social Interaction Technologies and Collaboration Software: Concepts and Trends*, 2 Vols. Hershey, PA: Information Science Reference.
- Fitzgerald, Hiram E., Angela Allens, & Peggy Roberts. (2010). "Campus-Community Partnerships: Perspectives on Engaged Research." In *Handbook of Engaged Scholarship: Contemporary Landscapes, Future Directions*, Vol. 2, eds. Hiram E. Fitzgerald, Cathy Burack, and Sarena D. Seifer (pp. 5-28). East Lansing, MI: Michigan State University Press.

T. DUMOVA

- Fitzgerald, Hiram E., Cathy Burack, & Sarena D. Seifer. (2010). *Handbook of Engaged Scholarship: Contemporary Landscapes, Future Directions*, Vol. 2: Community-Campus Partnerships. East Lansing, MI: Michigan State University Press.
- Francisco, Tim, Alyssa Lenhoff, & Michzel Schudson. (2012). "The Classroom as Newsroom: Leveraging University Resources for Public Affairs Reporting." *International Journal of Communication*, 6: 2677–2697.
- Gahran, Amy. (2012). "SeeClickFix: Crowdsourced Local Problem Reporting as Community News." *Knight Digital Media Center*, September 19. Available online at: <http://www.knightdigitalmediacenter.org/blogs/agahran/2012/09/seeclixfix-crowdsourced-local-problem-reporting-community-news>.
- Gurstein, Michael, ed. (2000). *Community Informatics: Enabling Communities with Information and Communication Technologies*. Hershey, PA: Idea Group Publishing.
- MacPherson, Ian, & Peter V. Hall, eds. (2011). *Community-University Research Partnerships: Reflections on the Canadian Social Economy Experience*. Victoria, BC: University of Victoria. Available online at: <http://ccednet-rcdec.ca/en/node/10640>.
- Harvard Humanitarian Initiative. (2011). *Disaster Relief 2.0: The Future of Information Sharing in Humanitarian Emergencies*. Washington, DC and Berkshire, UK: United Nations Foundation & Vodafone Foundation Technology Partnership. Available online at: <http://www.unocha.org/top-stories/all-stories/disaster-relief-20-future-information-sharing-humanitarian-emergencies>.
- Jeffres, Leo W. (2007). "Media Technology and Civic Life." In *Communication Technology and Social Change: Theory and Implications*, eds. Carolyn A. Lin and David J. Atkin (pp. 125-141). Mahwah, NJ: Lawrence Erlbaum Associates.
- Jenkins, Henry. (2001). "Digital Renaissance: Convergence? I Diverge." *MIT Technology Review*, June 1. Available online at: <http://www.technologyreview.com/Biztech/12434/>.
- Jenkins, Henry. (2006). *Convergence Culture: Where Old and New Media Collide*. New York: New York University Press.
- Jenkins, Henry. (2009). *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century*, The John D. and Catherine T. MacArthur Foundation white paper. Cambridge, MA: The MIT Press.
- Jenkins, Henry, & Mark Deuze. (2008). "Convergent Culture." *Convergence: The International Journal of Research into New Media Technologies*, 14(1), 5-12.
- Jensen, Klaus Bruhn, & Rasmus Helles. (2011). "The Internet as a Cultural Forum: Implications for Research." *New Media & Society*, 13(4), 517–533.
- Lambert, Nona, & Sabrina Carlson. (2011). "The Virtual Field: Remote Crisis Mapping of the Haitian Earthquake." *PRAXIS: The Fletcher Journal of Human Security*, 15. Available online at: <http://fletcher.tufts.edu/Praxis/Archives/xxv>.
- Lampe, Cliff, Robert LaRose, Charles Steinfield, & Kurt DeMaagd. (2011). "Inherent Barriers to the Use of Social Media for Public Policy Informatics." *The Innovation Journal*, 16 (1), article 6.
- Lardinos, Frederic. (2010). "Tweak the Tweet: New Twitter Hashtag Syntax for Sharing Information During Catastrophes." *ReadWriteWeb*, January 19. Available online at: http://readwrite.com/2010/01/19/a_new_twitter_hashtag_syntax_to_help_during_catast.
- Lievrouw, Leah A. (2009). "Technology in/as Applied Communication Research." In *Routledge Handbook of Applied Communication Research*, eds. Lawrence R. Frey and Kenneth N. Cissna (pp. 233-256). New York: Routledge.
- Lin, Carolyn A., & David J. Atkin. (2007). *Communication Technology and Social Change: Theory and Implications*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Lister, Martin, Jon Dovey, Seth Giddings, Iain Grant, & Kieran Kelly. (2009). *New Media: A Critical Introduction*. New York: Routledge.
- McDowell, George R. (2003). "Engaged Universities: Lessons from the Land-Grant Universities and Extension." *The ANNALS of the American Academy of Political and Social Science*, 585(1), 31-50.
- McGahey, Richard M., & Jessica S. Vey. (2008). *Retooling for Growth: Building a 21st Century Economy in America's Older Industrial Areas*. Washington, DC: Brookings Institution Press.
- McKinsey Global Institute. (2011). *Internet Matters: The Net's Sweeping Impact on Growth, Jobs, and Prosperity*. New York: McKinsey Global Institute. Available online at: <http://www.mckinsey.com/mgi>.
- McNall, Miles, Celeste Sturdevant Reed, Robert Brown, & Angela Allen. (2009). "Brokering Community-University Engagement." *Innovative Higher Education*, 33(5), 317–331.

- Mergel, Ines A., Charles M. Schweik, & Jane E. Fountain. (2009). "The Transformational Effect of Web 2.0 Technologies on Government." Paper presented at *the Association for Public Policy Analysis and Management, 1 June 2009*. Available online at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1412796.
- Metzger, Miriam J. (2009). "The Study of Media Effects in the Era of Internet Communication." In *The Sage Handbook of Media Processes and Effects*, eds. Robin L. Nabi and Mary Beth Oliver (pp. 561-576). Thousand Oaks, CA: Sage.
- Milakovich, Michael E. (2011). *Digital Governance: New Technologies for Improving Public Service and Participation*. New York: Routledge.
- Mooseburger, Karen, Caroline J. Tolbert, and Romana S. McNeal. (2010). *Digital Citizenship: The Internet, Society, and Participation*. Cambridge, MA: MIT Press.
- Norheim-Hagtun, Ida, & Patrick Meier. (2010). "Crowdsourcing for Crisis Mapping in Haiti." *Innovations: Technology, Governance, Globalization*, 5(4), 81-89.
- Norris, Pippa. (2000). "The Worldwide Digital Divide: Information Poverty, the Internet and Development." Paper presented at *the Annual Meeting of the Political Studies Association, London, UK, 10-13 April 2000*. Available online at: <http://www.hks.harvard.edu/fs/pnorris/ Acrobat/psa2000dig.pdf>.
- Norris, Pippa. (2008). *Digital Divide: Civic Engagement, Information Poverty, and the Internet Worldwide*. New York: Cambridge University Press.
- Nyden, Philip, Ann E. Figert, Mark Shibley, & Daryl Burrows, eds. (1997). *Building Community: Social Science in Action*. Thousand Oaks, CA: Pine Forge Press.
- Office of Community-Based Research, University of Victoria. (2009). *The Funding and Development of Community University Research Partnerships in Canada: Evidence-Based Investment in Knowledge, Engaged Scholarship, Innovation and Action for Canada's Future*. Victoria, BC: University of Victoria. Available online at: http://depts.washington.edu/ccph/pdf_files/CBRFunding051209%5B1%5D.pdf.
- Osimo, David. (2008). *Web 2.0 in Government: Why and how?* Institute for Prospective Technological Studies (IPTS) of the European Commission's Joint Research Centre (JRC), JRC Scientific and Technical Reports Series. Luxembourg: Office for Official Publications of the European Communities. Available online at: <http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=1565>.
- Ostrander, Susan A. (2004). "Democracy, Civic Participation, and the University: A Comparative Study of Civic Engagement on Five Campuses." *Nonprofit and Voluntary Sector Quarterly*, 33(1), 74-93.
- Penn Institute for Urban Research (IUR). (2012). *Penn Institute for Urban Research 2011-2012 Annual Report*. Philadelphia: Penn IUR. Available online at: <http://pennur.upenn.edu/about/>.
- Pierson, Jo. (2000). "Community Informatics for Electronic Democracy: Social Shaping of the Digital City in Antwerp (DMA)." In Michael Gurstein (Ed.), *Community Informatics: Enabling Communities with Information and Communication Technologies* (pp. 251-272). Hershey, PA: Idea Group Publishing.
- Rafaëli, Sheizaf, & Fay Sudweeks. (1997). "Networked Interactivity." *Journal of Computer-Mediated Communication*, 2 (4).
- Rainie, Lee. (2011). *Social Media and Civic Life*. Washington, DC: Pew Research Center's Internet & American Life Project. Available online at: <http://pewinternet.org/Presentations/2011/Oct/NASCIO.aspx>.
- Rheingold, Howard. (2008). "Using Participatory Media and Public Voice to Encourage Civic Engagement." In W. Lance Bennett (Ed.), *Civic Life Online: Learning How Digital Media Can Engage Youth* (pp. 97-118), The John D. and Catherine T. MacArthur Foundation Series on Digital Media and Learning. Cambridge, MA: The MIT Press.
- Rice, Ronald E. (2009). "Diffusion of Innovations: Theoretical Extensions." In Robin L. Nabi and Mary Beth Oliver (Eds.), *The Sage Handbook of Media Processes and Effects* (pp. 489-503). Thousand Oaks, CA: Sage.
- Rogers, Everett M. (1986). *Communication Technology: The New Media in Society*. New York: The Free Press.
- Rogers, Everett M. (2001). "The Information Society in the New Millennium: Captain's Log, 2001." In Carolyn A. Lin and David J. Atkin (Eds.), *Communication Technology and Society: Audience Adoption and Uses* (pp. 43-64). Cresskill, NJ: Hampton Press.
- Rogers, Everett M. (2003). *Diffusion of Innovations*. 5th ed. New York: Free Press.
- Silka, Linda, ed. (2006). *Scholarship in Action: Applied Research and Community Change*. Washington, DC: U.S. Department of Housing and Urban Development (HUD), Office of University Partnerships. Available online at: <http://www.huduser.org/portal/publications/commdev/scholarship.html>

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- Simpson, Matthew, Jay Burmeister, & Michael Docherty. (2004). "E-News: Community Interaction through Journalism." In Stewart Marshall, Wal Taylor, and Xinghuo Yu (Eds.), *Using Community Informatics to Transform Regions* (pp.252-270). Hershey, PA: Idea Group Publishing.
- Smith, Aaron, Kay Lehman Schlozman, Sidney Verba, & Henry Brady. (2009). *The Internet and Civic Engagement*. Washington, DC: Pew Research Center's Internet & American Life Project. Available online at: <http://www.pewinternet.org>.
- Soska, Tracy, & Alice K. Johnson Butterfield, eds. (2005). *University-Community Partnerships: Universities in Civic Engagement*. Binghamton, NY: Haworth Social Work Practice Press.
- Thomas, Sue, Chris Joseph, Jess Laccetti, Bruce Mason, Simon Mills, Simon Perril, & Kate Pullinger. (2007). "Transliteracy: Crossing Divides." *First Monday*, 12 (12). Available online at: <http://www.uic.edu/htbin/cgiwrap/bin/ojs/index.php/fm/article/viewArticle/2060/1908>.
- Thompson, Matthew, & Joy Emmanuel. (2012). *Assembling Understandings: Findings from the Canadian Social Economy Research Partnerships, 2005-2011*. Victoria, BC: University of Victoria. Available online at: <http://socialeconomyhub.ca/node/3249>.
- U.S. Department of Housing and Urban Development. (2011). *Collaborating for Change: Partnerships to Transform Local Communities*. Washington, DC: U.S. Department of Housing and Urban Development (HUD), Office of University Partnerships. Available online at: http://www.oup.org/publications/oup_pubs.asp.
- Vidal, Avis, Nancy Nye, Christopher Walker, Carlos Manjarrez, & Clare Romanik. (2002). *Lessons from the Community Outreach Partnership Center Program*. Washington, DC: U.S. Department of Housing and Urban Development (HUD), Office of Policy Development and Research. Available online at: http://www.huduser.org/portal/publications/commdevl/lessons_complete.html.
- Watson, David, Robert Hollister, Susan E. Stroud, & Elizabeth Babcock. (2013). *The Engaged University: International Perspectives on Civic Engagement*. New York: Routledge.
- Weil, Marie, Michael S. Reisch, & Mary L. Ohmer. (2013). *The Handbook of Community Practice*. 2nd ed. Los Angeles: Sage.
- Williams, Frederick, Ronald E. Rice, & Everett M. Rogers. (1988). *Research Methods and the New Media*. New York: The Free Press.
- Zickuhr, Kathryn, & Aaron Smith. (2012). *Digital Differences*. Washington, DC: Pew Research Center's Internet & American Life Project. Available online at: <http://www.pewinternet.org/topics/digital-divide.aspx>.

NOTES

1. In the United States, the Carnegie Foundation for the Advancement of Teaching (2010) defines community engagement as: "collaboration between institutions of higher education and their larger communities (local, regional/state, national, global) for the mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity." The purpose of community engagement is viewed as "the partnership of college and university knowledge and resources with those of the public and private sectors to enrich scholarship, research, and creative activity; enhance curriculum, teaching and learning; prepare educated, engaged citizens; strengthen democratic values and civic responsibility; address critical societal issues; and contribute to the public good" (see the Foundation's website at http://classifications.carnegiefoundation.org/descriptions/community_engagement.php).
2. See, for instance, a comprehensive volume edited by Chadwick and Howard (2008).
3. The term "informatics" (British acronym for information science) implies the focus on computer-based information technologies. However, besides information and computer scientists, the field benefits from the many contributions of political scientists, sociologists, urban and community planners, social and regional development specialists, journalists, environmentalists, and political activists (Gurstein 2000, p. i).
4. At a larger scale, digital divide refers to inequalities in access to ICT between industrialized countries and developing nations (Norris2008).
5. Digital citizenship is viewed as the ability to participate in societal life online.

6. E-governance refers to digital era governance.
7. In the early years of network computing in the 1960s and 1970s, computer-based technologies have been considered predominantly in technical terms and the study of communication technologies was the domain of electrical engineers and computer scientists. Until the late 1970s, communication scholars have been “remarkably hesitant to become engaged in investigating the new communication technologies” (Rogers, 2001, p. 48), and it was largely due to the work of Edwin B. Parker of the Institute for Communication Research at Stanford University, as Rogers indicated, that new communication technologies became the subject of investigation by communication scholars. It became evident that the study of unique aspects inherent in communication technologies, such as opportunities for two-way interaction, had to be continued.
8. The School of Journalism is part of the Faculty of Journalism and Communication of the Hogeschool Utrecht (University of Applied Sciences Utrecht).
9. J-Lab is an initiative of the Pew Center for Civic Journalism launched in 2002 and initially hosted by the Philip Merrill College of Journalism, University of Maryland. Its mission is “is to empower people to be global and civic players by pioneering interactive ways to participate in news and information” (see <http://www.pewcenter.org/about/j-lab.html>). In 2008, with the help of a US\$2.4 million grant from the John S. and James L. Knight Foundation, it moved to American University in Washington, D.C. and became a center at the School of Communications. More information can be found at <http://www.j-lab.org/about/history/>.
10. Data as of January 2013.
11. <http://www.cu-citizenaccess.org/feature/restaurant-inspections>
12. See <http://campusphilly.org/about-us/>
13. Among them are Community College of Philadelphia, Drexel University, La Salle University, Rutgers University - Camden, Temple University, University of Pennsylvania, The Richard Stockton College of New Jersey, Ursinus College, Villanova University, and other schools.
14. Michigan State University (MSU) Extension shares knowledge resources with Michigan residents on topics of regional economic development, agricultural methods, business development, livable communities, community gardening, safe food and water, youth entrepreneurship, and many others. MSU is the land grant institution of the state of Michigan.
15. <http://www.imacitychanger.org/>
16. See <http://www.imacitychanger.org/imacc/about/>
17. UN-HABITAT, 2012.
18. Mayor of Marseille, Mr. Jean-Claude Gaudin, became one of the first world’s famous personalities to support the campaign.
19. Penn IUR, 2012.
20. See <http://www.notforsalecampaign.org/about/press/>
21. Sex trafficking, forced labor, forced begging, and domestic servitude are the most prevalent forms of human trafficking, states the report published by the organization (see <http://www.notforsalecampaign.org/impact2012/quarter3/>).
22. The Free2Work app is available for download at <http://www.free2work.org/>
23. Data according to the Not For Sale Campaign’s 3rd quarter 2012 impact report. The report is available at <http://www.notforsalecampaign.org/impact2012/quarter3/>
24. <http://www.seeclickfix.com/>
25. Garhan, 2012.
26. <http://www.iaac.net/>
27. <http://www.smartcitizen.me/en/>
28. As of January 2013.
29. In 2009, to “leverage mobile & web-based applications, participatory maps & crowdsourced event data, aerial & satellite imagery, geospatial platforms, advanced visualization, live simulation, and computational & statistical models to power effective early warning for rapid response to complex humanitarian emergencies,” a group of 100 volunteer cartographers and technologists created an international Crisis Mappers community. Driven by the need to respond to devastating natural disasters and massive emergencies, this forum has grown into an international network of 5,000 members and 2,000 affiliated institutions, including 400 universities, 50 United Nations agencies, disaster response and recovery organizations, technology companies, and community networks in 160 countries (see <http://crisismappers.net/>).

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30. The project utilized the Ushahidi platform, an open-source crisis-mapping software developed in Kenya for verifying individual tweets and texts, validating geo-tag information, and managing crowdsourced data.
31. 4636 Alliance is a partnership between technology companies (including FrontlineSMS, CrowdFlower, and Digicel, the largest mobile phone network in Haiti), international non-governmental organizations, and emergency relief agencies formed in the aftermath of the Haiti earthquake in January 2010. The alliance provided an SMS shortcode, “4636,” for people in Haiti to submit free text message alerts and requests for help using their mobile phones.
32. Project EPIC started in 2009 as a partnership of the University of Colorado at Boulder and the University of California, Irvine as “a multi-disciplinary, multi-university, multi-lingual research effort to support the information needs by members of the public during times of mass emergency” with support from a US\$2.8 million grant from the U.S. National Science Foundation (<http://epic.cs.colorado.edu>).
33. See Harvard Humanitarian Initiative, 2011.
34. Such as Health Data Initiative (HDI) of the U.S. Department of Health and Human Services. See <http://www.hhs.gov/open/> for more information on HDI.
35. Data.gov/education is part of Data.gov, an initiative in democratizing public sector data launched by the U.S. government in 2009. The first open source code for the Data.gov platform has been made publically available and has been adopted by 140 countries, cities, and organizations.
36. The OrgPedia Open Organizational Data Project is funded by the Alfred P. Sloan Foundation. For more information, see <http://dotank.nyls.edu/orgpedia/>.
37. A city government volunteer agency in New York which works in partnership with other city agencies to engage one million of New Yorkers in volunteer activities. See <http://www.nycservice.org/#s> for more information.
38. Another NYC Service initiative, College Challenge, is an intercollegiate partnership with 18 local universities and colleges from across the five NYC boroughs formed to help connect college students, faculty, and staff with their surrounding communities and neighborhoods through high-impact volunteer projects in the city of New York. In this context, service is viewed as a key experiential learning component on campuses.
39. The report is based on a survey of 4,800 small and medium-sized enterprises in the United States, France, Germany, the United Kingdom, Italy, Japan, Canada, Russia, Brazil, India, China, and South Korea.