

# Emergent Forms of Technology–Influenced Scholarship

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**Royce Kimmons**

*University of Idaho, USA*

## INTRODUCTION

The term *scholarship* has undergone rethinking in recent years as scholarly professionals have expanded conversations about the process of knowledge development and the role of the scholar in society. Boyer (1990) argues that “what we urgently need today is a more inclusive view of what it means to be a scholar – a recognition that knowledge is acquired through research, through synthesis, through practice, and through teaching” (p. 24), and he proposes that scholarship includes the four practices of discovery, integration, application, and teaching. In each of these aspects of scholarship, technology plays a role in defining possibilities, identifying priorities, and shaping practice, and advances in information technology over the past few decades have yielded significant technological artifacts (such as ubiquitous computing devices, data collection and storage systems, the Internet, and social media) that influence what it means to be a scholar on an ongoing basis.

This article explores the intertwined relationship between technological advances and scholarly practice and draws attention to emergent forms of scholarship described in the literature. The article then highlights commonalities and differences between these emergent forms and discusses implications. Throughout this conversation, technology will be used as an anchor for connecting scholarly practices to advances and social shifts of our time and will be treated as a co-evolutionary artifact with scholarship rather than as a change agent (cf. Veletsianos & Kimmons, 2012b).

## BACKGROUND

As the historical centers of scholarly work for many centuries, universities have gradually developed and evolved in response to a variety of factors and are cur-

rently being reshaped in response to “globalization, mass expansion, and economic uncertainty, overlaid by new technologies connecting learners and content” and researchers “in new ways” (Siemens & Matheos, 2010, para. 17). Shifts in social norms and values and advances in technology have always impacted scholarship and the university, or institutionalized scholarship, in ways that reflect the needs and habits of the era (McNeely & Wolverton, 2008). Thus, when we consider emergent forms of scholarship connected to technology innovations, we must recognize that technology, society, and scholarship are all ever-evolving artifacts throughout all eras that influence and impact one another in complex and negotiated ways (Veletsianos & Kimmons, 2012b).

Some specific technologies that have historically impacted the creation and evolution of universities include the printing press, radio, television, microphotography/microfilm, mass publishing, microcomputers, the Internet, and social media (Binkley, 1935; Tate, 1947; Siemens & Matheos, 2010; Veletsianos & Kimmons, 2012b). Each of these technologies bring with it different affordances, limitations, assumptions, and challenges that impact how scholars work in each of Boyer’s areas of discovery, integration, application, and teaching. *Discovery* or the process of developing new knowledge through research is impacted as technologies improve efficiencies of data collection and analysis and allow for new methods of inquiry (e.g., big data, computational modeling). *Integration* is impacted as data and findings may be shared across distant locations and between experts within disciplines in a timelier manner. *Application* is influenced as scholars can more effectively report, serve, and collaborate with their communities, the public, and diverse colleagues from various disciplines. *Teaching* is impacted as scholars can teach students across geographic distances and employ new pedagogies and media to deliver instruction, assess student learning, and support student knowledge construction.

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## FORMS OF EMERGENT TECHNOLOGY-INFLUENCED SCHOLARSHIP

Many of the emerging scholarly practices that respond to recent technological advances associated with the Internet and social media have been categorized into at least four general forms: *digital scholarship*, *social scholarship*, *open scholarship*, and *networked participatory scholarship*. Each of these identified forms seeks to draw attention to a set of scholarly practices (or in some cases to advocate for those practices) in contradistinction to previous norms. This means that each form uses previous non-digital practices as a baseline for comparison and may not respond directly to discussions that surround other forms (e.g., those discussing digital scholarship may not respond to discussions about open scholarship). This in part reflects differences of values and intents for drawing attention to selected emergent practices but also reflects a certain amount of disconnect as scholars in different fields generate categorizations of emergent practice without revealing awareness of similar categorization processes being undertaken elsewhere through citations and responses. Each of these identified forms of emergent scholarship, however, is noteworthy and deserves summarization.

*Digital scholarship* draws attention to the power of the Internet and digital media for supporting the “scholarly information infrastructure,” facilitating “data and information-intensive collaborative research” (Borgman, 2007, xvii). As scholars in disparate locations can share data, work collaboratively via many communication modalities, and utilize the “infinite reproducibility of digital media at zero marginal cost” (Pearce, Weller, Scanlon, & Kinsley, 2010, para. 1), they are empowered to collaborate in ways that improve efficiency and bridge traditional barriers of time and location. Websites, electronic journals, email, listservs, and other digital materials have the impact of making information manipulation, sharing, and a variety of other activities necessary for scholarly *discovery* and *integration* “cheaper, faster, and easier” (Andersen, 2003, p. 206; Russell, Weinberger, & Stone, 1999). This has implications for other aspects of scholarship as well, but the affordances and strengths typically posited in support of digital scholarship heavily focus

on improving *discovery* and *integration* efficiencies and strengthening existing practice by leveraging technologies that reduce cost barriers, improve connections, and increase data processing power.

*Social scholarship* highlights the importance of social interaction between scholars to generate quality work and to induct new scholars into academe by utilizing computer-mediated mechanisms like discussion groups (Berge & Collins, 1995), blogs (Chong, 2010), and social networking sites (Greenhow, 2009) to support scholarship that is conversational and less formal than the traditional publication cycle (Oblinger, 2010). This has implications for both *discovery* and *teaching*. At the tertiary level, research “involves critical processing of knowledge with the application of ... attendant discipline-specific skills” and requires a high degree of mentoring to initiate students into the practice (Chong, 2010, p. 798). By supporting such informal communication and online communities, it is believed that social technologies can help scholars-in-training to more effectively learn the research process and also empower practicing scholars to leverage the expertise of their connected social groups to improve on-going work.

*Open scholarship* emphasizes the importance of utilizing technologies and practices for teaching and research that espouse openness and sharing for the purpose of broadening access to knowledge, reducing costs, enhancing scholarly impact, and developing “more equitable, effective, efficient, and transparent scholarly” practices (Veletsianos & Kimmons, 2012a, para. 3). Open access publishing, the development of open educational resources, and the teaching of open online courses are three prime examples of open scholarship that have gained great attention. In the case of open access publishing, journals utilize electronic media to reduce publication costs sufficiently to make published articles freely available to the public, and scholars seek to publish in these journals to increase access to and awareness of their work, thereby impacting *integration* and *application* (Eysenbach, 2006; Furlough, 2010; Norris, Oppenheim, & Rowland, 2008; Wiley & Green, 2012). Similarly, the development of open educational resources seeks to impact *teaching* by leveraging low-cost publishing and sharing technologies to provide access to educational content in a free and open manner (Caswell, Henson, Jensen, & Wiley,

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