Advances in Librarianship

Volume 39

Current Issues in Libraries, Information Science and Related Fields

Anne Woodsworth and
W. David Penniman
Editors

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Edited by

Anne Woodsworth

Glen Cove, New York, USA

W. David Penniman

Columbus, Ohio, USA

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Contributors

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Denise A. D. Bedford (81) School of Library and Information Science, Kent State University, Kent, OH, USA
Jennifer K. Donley (81) Heterick Memorial Library, Ohio Northern University, Ada, OH, USA
Samir Hachani (115) School of Library Science, University of Algiers 2, Algiers, Algeria
Mary Kandiuk (3) Scott Library, York University, Toronto, ON, Canada
Nancy Lensenmayer (81) School of Library and Information Science, Kent State University, Kent, OH, USA
Carla Teixeira Lopes (145) Faculty of Engineering, University of Porto, and Centre for Information Systems and Computer Graphics, INESC TEC Porto, Portugal
Maureen L. Mackenzie (47) Division of Business, Molloy College, Rockville Centre, NY, USA
Anamika Megwalu (185) Library, York College/City University of New York, Jamaica, NY, USA
Lorri Mon (241) College of Communication & Information, Florida State University, Tallahassee, FL, USA
Michael Perini (215) Fenwick Library, George Mason University, Fairfax, VA, USA
Abigail Phillips (241) College of Communication & Information, Florida State University, Tallahassee, FL, USA
Cristina Ribeiro (145) Centre for Information Systems and Computer Graphics, Institute for Systems and Computer Engineering of Porto, INESC TEC Porto, Portugal
Beth Roszkowski (215) Arlington Campus Library, George Mason University, Arlington, VA, USA
Harriet M. Sonne de Torrens (3) Department of Visual Studies and Library, University of Toronto at Mississauga, ON, Canada

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Preface

This volume is unusual in three ways. First, the theme is quite broad in scope and may even seem to be a "catch all." But it is in fact focused on a specific topic—that is to say innovations and boundary-pushing studies in areas not usually found in library literature. The second unusual feature is that this volume is our final work as editors of the *Advances in Librarianship* series. As we step down from this role, we want to thank all those who contributed to the success of the series and wish them all well. First among these is our steadfast Editorial Advisory Board members, without whom our past seven volumes would not have been successful. Similarly, there would have been no scholarly and research contributions to the field without our contributing authors, individual topical reviewers. Finally, our volumes, including this one, have been unusual in that we did not use guest editors to solicit and complete volumes in conjunction with us as series editors. Those roles were combined throughout our tenure, and yet, while that approach increased our individual workloads, we were pleased to have played this encompassing role. Again, we wish future guest and series editors all the best with ensuring the continued success of this book series in the future.

With respect to the content of this volume, the range of topics and the innovations which are described is impressive.

The authors herein present a look at the periphery of the field surveyed in previous volumes and provided chapters grouped into two categories — professional issues and transforming services. Chapters in the section on professional issues include the challenges facing librarians in an age of litigiousness and threats to academic freedom, education of ethical leaders for the information society by adopting practices from business, evaluation of intellectual capital assets by looking at the role of librarians in a knowledge society, and last but not least, exploration of emerging practices of open peer review as a means of achieving a "new science." In the section on transforming services chapters include research on the effects of terminology on health queries by analyzing user's health literacy and topic familiarity, an analysis of academic social networking via a case study of users' information behavior, a study on redefining services and spaces for graduate student

success by creating a "scholars' commons," and a final chapter on serving adults and teens in social spaces within a "virtual branch."

As noted above, we could not have succeeded with this final volume without the help of our Editorial Advisory Board. While we acknowledged in general terms the help we received from these talented individuals, we wish to name them specifically as they have been instrumental in making this series so successful, despite the juggling they did to fit us into their careers and private lives. They deserve special thanks for advice regarding themes for these volumes, including this final one in which we cast a wider net in search of innovations in our field. Members of this exceptional group are: Kenneth Haycock, Professor Emeritus at San Jose's School of Library and Information Science and more recently, Research Professor of Management and Organization at the University of Southern California in Los Angeles; Maureen Mackenzie, Business Professor at Molloy College, Rockville Centre, NY; Pat Levine (formerly Moholt), currently a consultant, grant writer and editor in Ashley Falls, MA, and retired Associate Vice President at Columbia University's Medical Center, New York, NY; Marie Radford, Chair and Professor of the Department of Library and Information Science at Rutgers University's School of Communication and Information, Newark, NJ; Robert A. Seal, Dean of Libraries at Loyola University, Chicago, IL, who also served on the Board for our predecessors; Louise Schaper, who after various management positions at AT&T Bell Laboratories, became an award-winning Executive Director of the Fayetteville Public Library, KS and is currently Vice President of Schaper Consulting Inc., Naples, FL; Barbara A. Stripling, Assistant Professor of Practice at Syracuse University's School of Information Studies in Syracuse, NY, and a past President of the American Library Association; and Cathy Wilt, Executive Director for the Pennsylvania Academic Library Consortium, Inc. (PALCI) in Philadelphia, PA.

We thank also members of the Emerald teams with whom we have worked over these past many volumes. Members of those teams have come and gone over the years, as change is inevitable in any organization, but we have appreciated the enthusiasm and helpfulness of all of the staff members who have been part of the process that has made this one of their most successful book series. To Emerald and its staff and the new editors, we wish all the best with sustaining and building on the past successes of *Advances in Librarianship*.

Anne Woodsworth
W. David Penniman
Editors

Professional Issues

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Librarians in a Litigious Age and the Attack on Academic Freedom

Mary Kandiuk[a] and Harriet M. Sonne de Torrens[b]
[a]York University Libraries, Toronto, ON, Canada
[b]University of Toronto Libraries, University of Toronto, Mississauga, ON, Canada

Abstract

With a focus on Canada, but framed by similar and shared concerns emerging in the United States, this chapter examines the current status of what constitutes and defines academic freedom for academic librarians and the rights and the protections individual, professional academic librarians have with respect to the freedom of speech and expression of their views in speech and writing within and outside of their institutions. It reviews the historical background of academic freedom and librarianship in Canada, academic freedom language in collective agreements, rights legislation in Canada versus the United States as it pertains to academic librarianship, and rights statements supported by Canadian associations in the library field and associations representing members in postsecondary institutions. The implications of academic librarians using the new communication technologies and social media platforms, such as blogs and networking sites, with respect to academic freedom are examined, as well as, an overview of recent attacks on the academic freedom of academic librarians in the United States and Canada. Included in this analysis are the results of a survey of Canadian academic librarians, which examined attitudes about academic freedom, the external and internal factors which have an impact on academic freedom, and the professional use of new communication technologies and social media platforms.

Keywords: Academic freedom; freedom of expression; academic librarians; social media; defamation; Canada

I. Introduction

On June 7, 2012, notice of action was filed in the Ontario Superior Court of Justice against McMaster University and Dale Askey, Associate University Librarian at McMaster University, by Edwin Mellen Press. The notice read that "The plaintiff claims $3.0 million dollars as damages arising from continuous publication on the world wide web by the

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defendant Askey. McMaster University is vicariously liable for the statements published by defendant Askey" (Edwin Mellen Press, 2012, para. 3). At issue was a blog post (between September 2010 and March 2012), called "The Curious Case of Edwin Mellen Press," which was written by Askey an American citizen, when he was employed as a librarian at Kansas State University. Askey's current employer, McMaster University, was accused of "[adopting] the defamatory statements as their own by permitting Askey to continue the publications and refusing to intervene to require Askey to remove the comments from the world wide web" (Edwin Mellen Press, 2012, para. 4). After a massive outcry and campaign from the academic, library, and publishing communities,[1] the lawsuit was withdrawn by Edwin Mellen Press, citing that "[F]inancial pressure of the social media campaign and press on authors is severe. EMP is a small company. Therefore [it] must choose to focus its resources on its business and serving its authors" (Ruf, 2013, para. 10). However, there is a second suit in the name of the owner of the company, Herbert Richardson, against Askey, as the sole defendant, which remains in force at the time of writing. Not long after the Askey case surfaced it was reported that Jeffrey Beall, associate professor and scholarly initiatives librarian at the University of Colorado, Denver, had also been threatened with not one, but two, lawsuits for a list of open-access journals and publishers he deemed questionable or predatory, posted on his blog. As reported by New (2013):

> The blog and the list, which is known to librarians and professors simply as *Beall's List*, has led to Beall being featured in *The New York Times*, *Nature*, and *The Chronicle.* The list now includes more than 250 publishers which he considers to be "potential, possible, or probable predatory" (para. 5) companies which take advantage of academics desperate to get their work published. In separate blog posts, Beall details why he believes the companies are misleading. (para. 5)

These types of lawsuits are commonly referred to as SLAPP (strategic litigation against public participation) and are designed to silence critics, in these instances academic librarians whose responsibilities include the critical evaluation of library materials. As cited in the Canadian Association of University Teachers (CAUT), Askey is quoted as saying:

> At the time I wrote the post, the work I was doing in libraries was directly related to assessing materials for potential inclusion in the library collection. It was, as such, my job to assess the quality of books … . As budgets decrease, the necessity to be more

[1]For more information on the issues involved concerning academic freedom and librarianship, see Dudley (2013).

> discerning increases, yet libraries have reduced their qualified staff numbers over the years. As a qualified and experienced librarian, I was sharing a professional opinion for consumption by peers. (para. 6)

While most SLAPP lawsuits are legally unsuccessful, according to the First Amendment Project (FAP) (n.d.) they succeed in the public arena. FAP states, "This is because defending a SLAPP, even when the legal defense is strong, requires a substantial investment of money, time, and resources. The resulting effect is a 'chill' on public participation in, and open debate on, important public issues. This 'chilling' effect is not limited to the SLAPP target(s): fearful of being the target of future litigation, others refrain from speaking on or participating in issues of public concern" (para. 2). As cited in New (2013), Beall says, "But even if you come out on top in the end, being forced to litigate is a problematic thing," he said. "It's costly and can still damage your reputation" (para. 16). The ripple effect has in fact cast a chill on the professional academic librarian community. As pointed out by Bivens-Tatum (2013) in his blog post, "Regardless of the outcome of the case, academic librarians should consider the implications of this lawsuit and its potential attack on academic freedom and the public expression of professional opinions on relevant subjects"[2] (para. 1).

These events present serious threats to the academic freedom of librarians who have fully embraced all aspects of communication technologies as part of their professional roles. Yet, the extent to which academic freedom is compromised by the increased use of new communication technologies is not fully understood. Nor have these developments been seriously considered with respect to professional rights. What rights and protections do individual professional academic librarians have with respect to the expression of views in speech and writing, including when using electronic communication, within and outside of their institutions? Librarians in Canada work closely with colleagues in the United States on many different levels and in various sectors of the profession, often criss-crossing the border for employment opportunities. But do librarians in Canada have the same rights and protection as librarians do in the United States?

This chapter, with a focus on Canada, analyzes what constitutes academic freedom and the freedom of speech for librarians in comparison with the academic rights of librarians in the United States. The analysis reviews

[2]Lawsuits regarding Edwin Mellen Press and Askey resulted in faculty associations across Canada demanding that they be withdrawn, and support given to Askey. For a full history and copies of these numerous letters see http://freedaleaskey.plggta.org/. Accessed on April 23, 2014.

current legislation in both Canada and the United States concerning academic freedom, examining the main differences and presents a brief overview of the history of academic freedom for librarians in Canada as it pertains to the development of the profession and the simultaneous unionization of faculty associations in Canada's public postsecondary institutions. Primary evidence for this study has been assembled from an analysis of 50 collective agreements from the major postsecondary institutions in Canada (Appendix A) and the findings of a survey undertaken to gather information from librarians across Canada about what protections Canadian academic librarians currently believe they have in the performance of academic activities and the use of social media platforms for personal and professional purposes (Appendix B).

II. Defining Academic Freedom for Librarians

The principles of academic freedom, intellectual freedom, and freedom of speech are neither a given nor necessarily a constitutional right for academic librarians in Canada. Nor do these core principles of postsecondary education have the same meaning from one academic institution to the next. Different stakeholders describe these freedoms from different perspectives. A faculty member's viewpoint of academic freedom is neither the same as that of an administrator nor that of a professional librarian nor that of a student (Jones, 2009). In some cases, intellectual freedom is all inclusive and includes academic freedom and freedom of speech, while in other instances, contractual, legal, religious, or political restrictions may be imposed restricting its meaning and scope. Intellectual freedom may be understood to include academic freedom for faculty members but this is not the case for academic librarians. Librarians need to be aware of what constitutes their rights and how they are defined at their institution (Trosow, 2011).

CAUT defines academic freedom for academic staff (faculty, librarians, archivists, and other recognized academics) as "the right to teach, learn, study and publish free of orthodoxy or threat of reprisal and discrimination. Academic freedom includes the right to criticize the university and the right to participate in its governance. Tenure provides a foundation for academic freedom by ensuring that academic staff cannot be dismissed without just cause and rigorous due process" (2011, Article 2).

CAUT's statement is all inclusive, without legal, political, or religious constraints. It includes many of the traditional principles and values as defined by the precedent-setting example of the American Association of University Professors (AAUP) *1940 Statement of Principles on Academic*

Freedom and Tenure with 1970 Interpretive Comments (AAUP, 1940–1970). By the late 1960s academic freedom had become the accepted rationale for why tenure should be granted to faculty. Tenure or what is known as permanent or continuing status/appointment has since become an essential requirement for securing academic freedom protection for librarians in Canada (Horn, 1999). The symbiotic relationship of tenure and academic freedom has long been recognized as beneficial to postsecondary institutions and their communities (Bryan, 2007; Gillum, 2010). As times change, so do the issues concerning academic freedom, and hence, institutional statements are modified, which may or may not be to the benefit of librarianship (SAFS, 1992–2014). The CAUT statement has added rights pertaining to the right to participate in the governance of the institution due to what is perceived by some as the changing, increasingly hierarchical, and corporate structure of Canadian universities (Turk, 2000).

In reality, what constitutes and legitimizes academic freedom for librarians in Canada, differs substantially from the constitutional rights of American colleagues, which accounts for one reason why the Edwin Mellen Press may have considered a libel suit a viable option in Canada but not in the United States. The First Amendment to the *United States Constitution* which constitutes the *Bill of Rights* (adopted on December 15, 1791) prohibits infringing on the freedom of the press and abridging the freedom of speech. It states: "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances" (United States Constitution Amend. I, 1791). Especially important for academics was the US Supreme Court's decision to recognize academic freedom as a protected right by the First Amendment in the *United States Constitution*, first in the 1957 decision concerning *Sweezy v. New Hampshire* and then later in the 1967 case of *Keyishian v. Board of Regents*-385 U.S. 589 (Chang, 2001). These decisions reinforced academic freedom as a legal, constitutional right outside institutional autonomy. The debate continues, however, and today the question is whether the First Amendment protects the academic freedom of the individual or institutional autonomy, a question which some consider a threat to academic freedom (Rabban, 2014). In 2010, David Naylor, President of the University of Toronto distanced himself from the newly released statement on academic freedom by the Association of Universities and Colleges of Canada (AUCC), which stipulated that "academic freedom must be based on institutional integrity … *and institutional autonomy*" (Thompson, 2014, p. 9). As times change, new issues emerge imposing restrictions or threats

to academic freedom. For example, the curtailment of privacy as regards intellectual freedom due to the *Homelands Securities Act*, places librarians in the United States at odds with the very principle they uphold (Jones, 2009). More recently, the *Academic Bill of Rights* (ABOR) is threatening to undermine the academic rights of students and faculty (American Library Association, 2014; Danner & Bintliff, 2006; Kaplin & Lee, 2013).

III. Canadian Legislation and Academic Rights

Since 1982 Canadians have had the protection of the *Canadian Charter of Rights and Freedoms* (1982), which forms the first part of the *Canadian Constitution Act*[3] and on provincial levels. In article 2(a)-(d) of Part I in the *Canadian Charter of Rights and Freedoms*, freedoms are outlined as "… freedom of conscience, freedom of religion, freedom of thought, freedom of belief, freedom of expression, freedom of the press and of other media of communication, freedom of peaceful assembly, and freedom of association." (*Canadian Charter of Rights and Freedoms*, Part I.2(a)-(d)). However, these freedoms are frequently prohibited or restricted by other Canadian bodies, for example, the freedom of the press may be restricted by bans from the courts, bureaucrats, politicians, and the government (English, 2012).

In theory, the *Canadian Charter of Rights and Freedoms* reference to "freedom of expression" should guarantee academic freedom, yet, for librarians in Canada this remains tenuous and untested terrain, compared to the legal constitutional right granted in the United States under the First Amendment (Chang, 2001). Furthermore, there is a separate section in the *Canadian Charter of Rights and Freedoms* specifying that the rights covered shall be protected "subject only to such reasonable limits prescribed by law as can be demonstrably justified in a free and democratic society" (*Canadian Charter of Rights and Freedoms*, Part I.1). Since 1982 there have been numerous court cases, which have tested the academic rights and freedoms of faculty and librarians in the *Canadian Charter of Rights and Freedoms*, from different perspectives: the mandatory retirement issues in Mckinney v. University of Guelph (1990), and the issue of apartheid and freedom of speech in Bancroft et al. v. Governing Council of the University of Toronto (1986). However, as far as the authors are aware, there have been no cases which have specifically tested the right to freedom of speech, inside and

[3]Prior to 1982, the Charter was preceded by the *Canadian Bill of Rights* (1960), which was a federal statute not a constitutional document.

outside an academic institution for academic librarians in a nonunionized environment.

Canada is also a signatory of the *United Nations Universal Declaration of Human Rights* (1949), the forerunner of Canada's subsequent *Charter of Rights and Freedoms*, and model for the *Quebec Charter of Human Rights and Freedoms* (Schabas, 1998) which states in article 19 of the United Nations' declaration that "Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers" (para. 1). These are the general rights accorded to every Canadian but have not, to the best of our knowledge, as in the case of the United States, been tested in Canadian courts to determine if they specifically protect a librarian's right to academic freedom. From the 1970s faculty and librarians have sought the additional protection for academic freedom in collective agreements negotiated by institutional faculty and librarian associations.

IV. History of Academic Librarianship and Academic Freedom

The quest for academic rights by academic librarians in Canada has taken a different path than that of our colleagues in the United States. There have been, however, pivotal points in our shared history where the two different but similar tracks have interconnected and where the achievements of one group have influenced the other. This is especially true concerning the influence of the American Library Association (ALA) and the AAUP. Their early recognition that academic librarians required academic status and corresponding rights had a major impact on the development of academic librarianship in Canada in the 1960s and 1970s.

In 1946 ALA endorsed the 1940 AAUP *Statement of Principles on Academic Freedom and Tenure* and adopted a version for librarians (McAnally, 1975; Rubin, 2000). In 1956 the AAUP welcomed librarians as members (Highby, 2004). Several decades later in 1971 the Association of College and Research Libraries (ACRL), the Association of American Colleges (now the Association of American Colleges and Universities (AAC&U)), and the AAUP formed the national Joint Committee on College Library Problems, which resulted in the *Joint Statement on Faculty Status of College and University Librarians* (ACRL, 2012) which affirmed that academic librarians needed tenure, academic freedom, and intellectual freedom. It was adopted by the Council of the AAUP in April 1973 (ACRL, 1973) and reaffirmed by the ACRL board in 2001 and again in 2007. It is premised on the idea

that "… the character and quality of an institution of higher learning are shaped in large measure by the nature and accessibility of its library resources as well as the expertise and availability of its librarians" (AAUP, 2012, para. 3; ACRL, 2012, para. 1). These statements have served as key models for institutions formulating policies for academic librarians in the United States and for librarians in Canada for several decades.

In Canada, national support for academic librarianship by associations and postsecondary institutions was slow to develop and librarians had to struggle to gain recognition for their profession (Sonne de Torrens, 2014). To a great extent, the differences have shaped the attitudes of librarians today. If one examines the literature on academic freedom and postsecondary education in Canada, it soon becomes evident that librarians were not part of that discourse until the 1970s. This is not to say that academic freedom has not been a vital component of postsecondary education in Canada, for it has, and certainly, discussion over academic freedom issues has a long history which can be traced back to the formation of Canada's oldest institutions University of Toronto (founded 1827), McGill University (founded 1821), Queen's University (founded 1841), Laval University (founded 1663), Dalhousie University (founded 1818), and others (Horn, 1999). However, the topics discussed have always focused on matters concerning the faculty or students. Academic librarians were not part of that discourse (Sonne de Torrens, 2014). Today, no less than in the past, this topic remains at the forefront of academic communities (SAFS, 1992–2014) but still with little reflection or understanding on the role of libraries or professional responsibilities of academic librarians in relation to this core academic principle.

The changes to academic librarianship in the 1970s were closely aligned to developments in postsecondary education in Canada. The shift from federal to provincial funding of postsecondary education and financial support for graduate programs in the 1960s gave rise to a proliferation of new universities and colleges, as well as, a wide range of new graduate programs. The time constraints of faculty due to the increased demands in teaching and the development of graduate programs had, for the most part, gradually shifted the management of libraries from faculty to librarians. During this period, the profession of academic librarianship underwent an intense review, resulting in the establishment of new graduate programs in library science and recognition that academic librarians were needed to build the necessary resources and libraries for the growing areas of specialized research and teaching (Sonne de Torrens, 2014). With that came academic expectations, recognition for the profession's role in postsecondary education, and a call for securing academic rights. Models were sought from the United States. It is known from the literature that ACRL's push for new policies concerning appointments,

promotion, and tenure for academic librarians in 1973–1974, and its "Model Statement of Criteria and Procedures for Appointment, Promotion in Academic Rank and Tenure for College and University Librarians" had a tremendous impact on colleagues seeking academic status in Canada (Sonne de Torrens, 2014). Furthermore, there was a shared exchange of values, ideas, and goals with American colleagues over many decades that encouraged librarians in Canada to seek similar status and rights (Ford, 1984).

The rapid growth of postsecondary institutions and the recognition of academic librarianship as an important contribution to academic communities fuelled the urgency of securing academic rights and protection. Two more factors were to have a lasting impact on how the profession evolved as we know it in Canada. First, the rise of employment equity issues in the 1970s contributed to better employment terms and second, the certification of faculty associations in Canada, which began to include academic librarians as members of the faculty associations. These developments would redefine the rights and status of academic librarians.

V. Intellectual Freedom without Academic Freedom

One important difference between faculty and librarians' statements on academic rights is the way in which the concept of intellectual freedom has been gradually redefined in the profession of librarianship. Traditionally, intellectual freedom and academic freedom have been understood as linked, but they are no longer considered identical (Danner & Bintliff, 2006). For faculty, intellectual freedom is normally interpreted in the broadest sense, which includes academic freedom for individuals (Bromwich, 2012). Byrne (1999), in his assessment of the UN *Universal Declaration of Human Rights* offers an excellent interpretation of how libraries have come to view intellectual freedom: "… Intellectual Freedom provides a principled basis for our professional practice as librarians, as we develop collections (physical or digital), provide access and delivery services, and offer support and information. It is no less important in guiding the administration of our libraries …" (p. 108). Unfortunately, this definition excludes the rights of individual librarians. This is essentially how intellectual freedom has come to be defined in the library profession (Granfield & Barakett, 1990). Why is this distinction important to academic librarians? Because often it is falsely assumed that this definition includes academic freedom protection for the individual librarians who work to ensure a library adheres to intellectual freedom principles. If there is no mention of the academic freedom or the rights of the individual when discussing intellectual freedom, then there is

no guarantee that individuals have the protection of academic freedom. In addition, librarians must learn to differentiate between what rights an institution may have as opposed to what rights the individual may have when stipulating these rights.

In the last few decades in Canada, the concept of intellectual freedom has acquired a narrow, profession-centric definition that excludes academic freedom and has gradually imposed restrictions not found in Canada's *Charter of Rights and Freedoms* and the *United Nations Universal Declaration of Human Rights* to which Canada is a signatory (Bromwich, 2012). As Danner and Bintliff have pointed out "in librarianship, statements on intellectual freedom often focus more exclusively on rights of access to information than on freedom of expression" (2006, p. 20). In the profession of academic librarianship intellectual freedom is usually understood as a principle or value to be upheld in the administration of libraries and in the context of librarians' responsibilities. It is not discussed as a right that they have as professionals. This is why in the Simon Fraser University Faculty Association (SFUFA) Framework Agreement (2007) statement on academic freedom for the librarians at Simon Fraser University, the reference to intellectual freedom specifically includes references to the rights of the individual librarian:

> Librarians have a duty to promote and maintain intellectual freedom. They have a responsibility to protect academic freedom and are entitled to full protection of their own academic freedom. This includes the right to express their academic judgment in the development of the Library collection within the context of Article 1.3.2 and to make the collection accessible to all users in accordance with the University Library policies, even if the materials concerned are considered controversial. (Section 1.2.c., paragraph 3)

This shift in emphasis has been influenced by a number of developments. First, the influence of corporate models in the management of Canadian universities and colleges has contributed to the demise of academic libraries as being viewed as centers of learning, knowledge, and research, subtly shifting the traditional meaning of what constitutes an academic library to asset management, service points, or service centers. Albeit subtle, this has raised questions about the academic rights and status of academic librarians and those who manage the libraries (Smallman, 2006; Stone, 2012). The second major influence has been the trend of library associations to embrace a narrow, profession-centered definition of intellectual freedom. By adopting a profession-centric meaning, codes of ethics and intellectual freedom can apply across the board to all members but, when applied to an academic community, no longer offers the protection needed by academic librarians. This has been the case with the mission and intellectual freedom statements

written by library associations over the past decade. This shift in emphasis has marginalized academic librarians and introduced ambiguity, which needs to be clarified in collective agreements and policies. For example, the *ALA Intellectual Freedom Principles for Academic Libraries*, approved by ACRL Board of Directors on June 29, 1999 and adopted by ALA's Council on July 12, 2000, emphasizes access and accessibility (ACRL, 1999; ALA, 2000). As stated on the ALA web site, the manual is intended to "to answer practical questions that confront librarians in applying the principles of intellectual freedom to library service" (ALA, 2014, para. 1). The Canadian Library Association's (CLA) mission statement refers to intellectual freedom as one of the values that they champion as a national voice for Canada's library communities (CLA, 1985b), and the British Columbia Library Association *Statement on Intellectual Freedom* has a similar emphasis on access and administration of libraries (BCLA, 2014, n.d.). There is no mention of what constitutes individual librarians' rights or academic freedom by neither of the aforementioned associations. The statement of values by CLA and the section entitled, Canadian Association of College and University Libraries (CACUL), which is now disbanded, states "intellectual freedom, diversity, transparency and open communication, accountability, universal access to library service, member voices and contributions, collaboration" and also effectively states that CLA's operating principles are to "facilitate the many diverse opinions and ideas about libraries and library issues" (CLA, 2011, para. 3). It should also be noted that CLA's *Position Statement on Intellectual Freedom* stipulates that:

> All persons in Canada have the fundamental right, as embodied in the nation's Bill of Rights and the Canadian Charter of Rights and Freedoms, to have access to all expressions of knowledge, creativity and intellectual activity, and to express their thoughts publicly. This right to intellectual freedom, under the law, is essential to the health and development of Canadian society. (CLA, 1985a, para. 1)

There is no reference to academic freedom. The Canadian Association of Research Libraries (CARL) has a statement on *Freedom of Expression* and refers to the rights granted to Canadians under the Canadian Human Rights Code (adopted by the CARL membership, ca. 1987). The statement refers to "all expressions of knowledge, creativity and intellectual activity" (para. 1) but not to academic freedom or intellectual freedom. The word activity does not denote freedom nor does it mean knowledge or academic freedom. Nowhere in the CARL statement is the word freedom noted:

> All persons in Canada have a fundamental right, as embodied in the Charter of Rights and Freedoms and the Bill of Rights, to have access to all expressions of knowledge,

> creativity and intellectual activity. It is the responsibility of research libraries to facilitate access to all expressions of knowledge, opinion, intellectual activity and creativity from all periods of history to the current era including those which some may consider unconventional, unpopular, unorthodox or unacceptable. To this end research libraries shall acquire and make available, through purchase or resource sharing, the widest variety of materials that support the scholarly pursuits of their communities. (CARL, *Freedom of Expression*, 1987, para. 1)

In these cases intellectual freedom with respect to professional responsibilities is emphasized not the rights of the individual librarian. This is a key difference in the statements issued by the American versus the Canadian library associations. This gap has resulted in CAUT addressing these issues from a number of perspectives and recently, the formation of a new, national association dedicated to academic librarianship, the Canadian Association of Professional Academic Librarians (Canadian Association of Professional Academic Librarians (CAPAL) Steering Committee, 2013b; Granfield, Kandiuk, & Sonne de Torrens, 2011). In 1986 CAUT/CACUL issued *Guidelines on the Terms and Conditions of Employment for University Librarians* which explicitly stated support for tenure, academic freedom, and the rights of the individual academic librarian and were subsequently reproduced in CAUT's Librarians' Committee, *Policies Concerning Librarians*:

> … the professional staff of university libraries are partners with faculty members in contributing to the scholarly and intellectual functions of the university and should be accorded academic status, and the rights and responsibilities of that status … It has long been established that librarians have a duty to maintain intellectual freedom in the community. In the discharge of that duty in the narrower context of the university, librarians have a responsibility to protect academic freedom and are entitled to full protection of their own academic freedom. (CAUT Librarians' Committee, 1989, p. 5-1)

VI. Librarians, Collective Agreements, and Faculty Associations

Unlike postsecondary institutions in the United States where a large number are private and often governed by a different set of laws (Wickens, 2008), the majority of Canadian universities and colleges are publically funded institutions. Today, more than 90% of faculty associations in Canada are certified trade unions with negotiated collective agreements which include librarians and faculty, and often other academic professions, such as archivists and curators. Statements on what constitutes academic freedom and freedom of speech are pivotal clauses in collective agreements negotiated by certified faculty associations or in memorandum of agreements

negotiated by noncertified faculty associations, ensuring the protection of faculty and librarians. Such statements enshrine the right to exercise professional responsibilities and participate in academic activities without fear of sanction and ensure maximum protection for librarians that can be grieved if abused. But, it should be noted that these statements do vary and do not always cover the same scope or issues. Nevertheless, collective agreements play an important role in defining academic freedom for faculty and librarians in Canada. In fact, the protection of academic freedom has often been given as one of the primary reasons for why faculty associations have historically certified (DeCew, 2003).

For this study 50 collective agreements representing the largest, provincial degree-granting universities and colleges were selected. Other criteria required that these institutions employ academic librarians and that the terms of employment include the three primary areas of responsibilities (professional practice, scholarship, and service). An advanced search of the CAUT Collective Agreement database was conducted to determine the following: (1) were librarians included in the same collective agreement as faculty; (2) or was there a separate policy for librarians; (3) is there an academic freedom statement; (4) and if yes, were librarians covered under the same academic freedom statement as faculty or was their academic freedom clause different (Appendix A).

In most cases the existence of a collective agreement or memorandum of agreement with administration will ensure there is a statement on academic freedom for faculty and librarians. However, there are a few exceptions. Under the leadership of University Librarian Jeff Trzeciak, librarians at McMaster University unionized and certified separately from faculty. However, their current collective agreement contains no reference to academic freedom nor the right to pursue scholarship as part of their professional activities. As far as we know, this is the only certified association for academic librarians at a postsecondary institution with a collective agreement in Canada that does not include a statement on academic freedom. What academic freedom protection do librarians at noncertified academic institutions have? At press time, 3 of the 50 university faculty associations reviewed in this study were not certified as trade unions (McGill University, University of Toronto, University of Waterloo) and 2 were in the process of negotiating their first collective agreements as newly certified faculty associations: Simon Fraser University and University of Northern British Columbia (University of Northern British Columbia, 2014). The University of Toronto Faculty Association has a *Memorandum of Agreement* with the University of Toronto administration which stipulates academic freedom protection for faculty and librarians. As far as we have been able to determine, neither McGill University nor the McGill University Faculty

Association currently have a statement on the protection of academic freedom for librarians or faculty (McGill, 2014). Librarians at the University of Waterloo are not members of the University of Waterloo Faculty Association, which is not certified, nor do they have an academic freedom statement as part of its *Librarians' Employment Handbook* (2010). The *Memorandum of Agreement's* (2013) clause on academic freedom protects only full-time faculty, lecturers, and clinical faculty; librarians are excluded.

Of the 50 Canadian colleges and universities examined in this study (Appendix A), only 7 institutions (Athabasca University, Bishop's University, McGill University, McMaster University, University of Alberta, University of Waterloo, University of Western Ontario) have separate policies and/or collective agreements for librarians (see, e.g., University of Western Ontario, 2010–2014, 2011–2015). In some of these cases, differences are evident between the academic rights of faculty versus librarians. Ensuring that there is one policy on academic freedom for both faculty and librarians is the first, essential step in providing Canadian academic librarians with the protection of academic freedom. On its own, institutional support for the principles of academic freedom will not ensure that librarians are protected.

There is a growing sector that argues that academic freedom is a privilege that is "given" by the institution, and, hence, institutions have the right to impose constraints on freedoms already granted under current Canadian legislation. This is based on the idea that institutions, not individuals, have the right of academic freedom as discussed earlier in this chapter (Thompson, 2014). This may result in restrictions pertaining to religious or legal concerns being imposed on academic freedom provisions (Bruneau, 2014). Typical of religious postsecondary institutions, is the language used in the collective agreement for St. Michael's University, a Catholic university, at the University of Toronto; academic freedom is deemed "subject to the provisions of *Ex Corde* and Ordinances set out in the Preamble to this Agreement" (St. Michael's College, 2012–2014, Article 5.1B). In the Queen's University Collective Agreement for faculty and librarians, it states that "Academic freedom does not confer legal immunity" (Queen's University, 2011–2015, Article 14.4). A more frequent restriction is the disclaimer that personal, individual viewpoints do not reflect the views of their institution. For example, in the York University Collective Agreement for faculty and librarians, it states: "When exercising their rights of action and expression as citizens, employees shall endeavour to ensure that their private actions or expressions are not interpreted as representing positions of York University" (York University, 2012–2015, Article 10.02). This distinction between individual views and those of the institution are frequently

encountered in collective agreements and other institutional guidelines, such as the University of Western Ontario's *Statement of Academic Freedom* in Article 7 which states: "Members shall not purport to speak on behalf of the Employer or the Association unless specifically authorized to do so" (SAFS, 2004, p. 4). This raises the question, who is authorized or not to express a professional view, and under what circumstances? Clearly, these examples of different types of restrictions serve to silence rather than encourage open discourse in academic environments.

VII. Survey on Academic Freedom

How aware are academic librarians of their rights and protections with respect to academic freedom and what are their experiences exercising academic freedom? To address these questions, a web-based survey entitled "Canadian Academic Librarians Academic Freedom Survey" was developed using *SurveyMonkey* that included both closed and open-ended questions. This was an anonymous and voluntary survey approved by the Ethics Review Committees at the University of Toronto and York University. The survey was divided into two parts. The first part was comprised of 29 questions which related to academic freedom protections with respect to the performance of academic activities, experiences in the exercise of academic freedom during the performance of academic activities, attitudes toward and understanding of academic freedom, and external factors and internal factors which have an impact on academic freedom. The second part was comprised of nine questions relating to academic freedom and its relation to the use of social media and networking tools. The survey was pretested using a small sample ($n = 2$) of academic librarians, including one librarian who had experience with defamation. Efforts were made to distribute the survey to all academic librarians employed at a Canadian university or college. The survey was distributed via multiple national, provincial, and specialized librarians' lists from March 21 to April 11, 2014. Three hundred forty-eight responses were received; 86.59% ($n = 284$) of respondents identified as being employed at a university, while 13.41% ($n = 44$) identified as being employed at a college. For the purposes of this chapter the responses from 284 academic librarians employed at Canadian universities on the subject of academic freedom as relates to freedom of expression both within and outside respondents' institution and as relates to the use of social media tools and networking platforms have been integrated into this analysis (see Appendix B for the survey questions).

Of the 284 respondents to the survey, 32.41% ($n = 84$) of academic librarians employed at a Canadian university did not know if their institution

had a formal statement regarding academic freedom, regardless if they belonged to a certified or noncertified faculty association. As is illustrated in Table 1 the majority of respondents (67.44%; $n = 174$) reported that they belonged to a certified faculty association that included faculty and librarians.

Of those who were aware of a formal statement on academic freedom, a majority of respondents, 70.13% ($n = 108$), indicated it was made available in their collective agreement, 42.21% ($n = 55$) responded it was available on the institution's web site, 8.44% ($n = 13$) did not know where it was located, and 7.14% ($n = 11$) indicated it was available in the *Memorandum of Agreement*. Several respondents stated that the statement was available in a policy document raising the question of the force of a policy that exists outside of a collective agreement. For those respondents who indicated that their institution had a formal statement regarding academic freedom the majority of respondents, 86% ($n = 129$), indicated that this statement covered and protected librarians, while 12% ($n = 18$) did not know, and 25% ($n = 3$) said it did not.

How secure do librarians in Canada feel about openly criticizing the policies of their library, institution, or administration? Statements of academic freedom for faculty and librarians typically include the right to question and criticize the institution. However, in the survey, whether certified or not, only 39.90% ($n = 83$) of the librarians felt free to voice criticism, while 32.12% ($n = 67$) reported only sometimes, and 24.04% ($n = 50$) indicated they did not. What were the reasons given for this? When asked to elaborate, the numerous comments ($n = 77$) provided by respondents revealed that in many cases the freedom to openly criticize was neither

Table 1
Union/Association Membership

Affiliation	*n*	Percentage of total responses
Certified trade union/certified faculty association which includes faculty and librarians	174	67.44
Certified trade union/certified association that includes only librarians	12	4.65
Noncertified faculty association that includes faculty and librarians	51	19.77
Noncertified association that includes only librarians	3	1.16
Not member of any kind of union, association, etc.	7	2.71
Don't know	11	4.26

$N = 297$.

supported nor encouraged. Moreover, a fear of repercussion, whether regarding promotion, work-related assignments, or discretionary funding, was expressed by many of the respondents who provided comments. In addition, several respondents who identified as working in administration ($n = 56$) expressed the "inappropriateness" of criticizing their institution and felt expressions of dissent were frowned upon. The comments reveal an inconsistency with respect to what is considered appropriate and politically astute—concerns expressed by a number of respondents. Negative criticism was in some cases defined as "unprofessional" while others felt it must be constructive. Generally, there was considerable uncertainty regarding what the value of risking negative criticism might be and most librarians practiced self-censorship in the face-to-face workplace, especially those who did not have permanent status or tenure.

When respondents were asked whether they felt free to express their views within the institution in speech, writing, and through electronic communication without sanction less than half, 48.56% ($n = 101$), indicated yes, while 25.58% ($n = 53$) indicated only sometimes, and 22.12% ($n = 46$) answered no. For those 65 respondents who provided comments the reasons preventing freedom of expression were similar to those provided in response to the previous question. Concerns were expressed about impact on promotion, backlash from both peers and supervisors, and more subtle repercussions, that is, selection for committees. Even those who felt protected felt inhibited such as the following respondent:

> Even though there are protections and one is not likely to lose their job, some views can put one at risk to fall out of favour with superiors, which can negatively impact one's potential for success (not being chosen for projects, ideas rejected, etc.).

With respect to expressing one's views outside the institution, 52.17% ($n = 108$) of librarians felt they could express their views freely, 27.54% ($n = 57$) answered sometimes, and 14.98% ($n = 31$) felt they could not. Respondents indicated they felt at risk and were reluctant to express negative views even outside the institution for fear of repercussion. Those that did openly speak their views noted that they made a distinction between giving a personal viewpoint rather than speaking on behalf of the university.

VIII. Freedom of Speech and New Communication Technologies

In Canada, freedom of speech is understood as a "fundamental freedom" in the *Canadian Charter of Rights and Freedoms* (1982, Part I.2) and for Americans is historically understood to be protected in the First

Amendment to the *United States Constitution* which constitutes the *Bill of Rights* in the *United States Constitution*. The International Federation of Library Associations' (IFLA) *Statement on Libraries and Intellectual Freedom* (1999) does not employ the phrase, freedom of speech, but instead, employs a more inclusive phrase, the "freedom of expression":

> … the right to know and freedom of expression are two aspects of the same principle. The right to know is a requirement for freedom of thought and conscience; freedom of thought and freedom of expression are necessary conditions for freedom of access to information. (para. 4)

IFLA's reference is based on article 19 in the *Universal Declaration of Human Rights*, to which Canada is also a signatory:

> Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers. (United Nations, Article 19, 1949, para. 1)

These are the guiding tenets of freedom of speech and freedom of expression under which, theoretically, Canadian librarians should be protected, that is if their collective agreements do not impose restrictions (de la Peña McCook, 2008; Samek, 2008).[4] Given that communication and media have radically changed in the last decade, new questions have surfaced and remain unanswered. For example, to what extent are electronic forms of communication protected under the current legislation compared to traditional forms of communication (O'Neil, 2008a)? Is there really any difference or is it the way in which these new media are being used? The advent of new communication technologies and social media platforms poses opportunities, as well as potential risks for academic librarians, many of whom have embraced tools and platforms such as blogs (weblogs), microblogs (Twitter), Facebook, among many others. As pointed out by Rowe and Brass (2011), "It is accepted practice across the higher education sector for academic staff to engage in public comment on the basis of their area of scholarly expertise" (p. 7). This includes academic librarians.

Public comment that once took place in the realm of traditional mainstream media—print, television, radio—in the present day has transcended

[4]For discussion regarding American librarians who are reviewing the ramifications of this UN document in terms of their own workplace, primarily those in public libraries who do not usually have the protection of academic freedom in their collective agreements, see the special issue and articles by Toni Samek and Kathleen de la Peña McCook.

to a wide range of social media platforms which serve as an informal venue for scholarly communication and citizen journalism. To a large degree this reflects the parallel, global complexity of how academic libraries operate today and, hence, the boundaries are often blurred and difficult to distinguish. Many academic librarians use a range of social media platforms—the most common being blogs and micro-blogs—as a vehicle for sharing personal and professional views, including matters relating to their work as professional librarians. In a 2009 study, Aharony found "the majority of LIS blogs can be classified as 'mixed,' as they contained both personal and professional postings. Thus, most topic-oriented blogs in both periods convey professional information presented with a personal touch" (2009a, p. 595). Furthermore, "the special nature of the blogs can function as a medium for dissemination of professional information as well as a platform for free expression" (p. 595). Blogging has been described as a form of "conversational scholarship" and "extra-curricular engagement" and providing access to "non-filtered sources of information" which are not accessible via the traditional media sources (Gregg, 2006; Turgeon, 2004). "LIS professionals also acknowledge the fact that blogs can serve as a source of competitive intelligence and that they can play a role in monitoring products and services," writes Aharony (2009b, p. 175). Librarians are using the increasingly popular micro-blogging tool Twitter to network and share information in real time, whether it is to post updates from conferences or requests for help and Twitter has emerged as the source for the most up-to-date information and news. In a recent study analyzing blogs, Jackson-Brown found that the "political genre" comprised a considerable amount of the content in librarian blogs. "Blog topics involving customer or user advocacy, pro or con, around companies' or vendors' products and services were frequent 'political' content that appears across the 12 blogs" examined by Jackson-Brown (2013, para. 4). As a result blogs also appear to be one of the most potentially perilous social media platforms as it is librarian blogs that are at the center of recent defamation lawsuits. Hurt and Yin (2006) write, "In fact, conventional wisdom seems to warn that blogging may be a risky venture for those academic bloggers who have not been awarded tenure and the liberating academic freedom that comes with that status" (p. 1236). Yet how far do the protections of tenure and academic freedom extend when it comes to posting statements on a personal blog, via Twitter, or using any other social media platform for that matter?

An important court case involving the University of Calgary was recently reported in the Canadian press concerning students' rights in an academic community versus institutional guidelines for appropriate conduct and use of social media (Carpay, 2014). Three times in the past 4 years,

the Canadian court has deemed that the University of Calgary violated the freedom of speech rights of students on their campus, according to the *Canadian Charter of Rights and Freedoms*. In reference to the institution's internal restrictions imposed on conduct, speech, and behavior, the court explicitly stated in the legal case of *Pridgen v. University of Calgary* in 2010 (Hansen, 2012; MLB-Slaw, 2010), that "the university is not a Charter-free zone" (Carpay, 2014, para. 2) when students posted on *Facebook* comments about a professor.[5] The court's decision that universities must comply with the *Canadian Charter of Rights and Freedoms* overrides institutional authority, and hence, asserts the rights of individuals within institutional environments. The Board of Governors at the University of Calgary had failed to take into account "the nature and purpose of a university as a forum for the expression of differing views" (Justice Centre for Constitutional Freedoms, 2014, para. 3) when a pro-life display was set up by a group of students in the *Wilson v. University of Calgary* case. These cases illustrate an uncomfortable disconnect between the institutional, public statements of support for academic freedom and actual institutional agendas and actions. Moreover, they serve as appropriate examples of how internal institutional restrictions, which are sometimes understood as forfeiting, higher, overarching rights, do not hold up when pursued in a court of law.

In response to the increased use of new communication technologies academic institutions have moved to develop social media policies and guidelines. However, an advanced search of the CAUT Collective Agreement database did not reveal any language relating to the use of social media and new communication technologies in collective agreements for unionized faculty and librarians at Canadian universities. Does this mean the statements affirming academic freedom are understood as including protection for freedom of speech? Currently the practice is for social media policies and guidelines for academic staff to be produced by Communications or Media Departments and Offices, who "have emerged as important organizational gatekeepers, intermediaries and managers in the 'zone' of university-public exchange" (Rowe & Brass, 2011, p. 3). This raises the question of the force of these policies and what protection, if any, academic staff have with respect to freedom of expression when using social media beyond the parameters of their institutions.

[5]Canada has legislation concerning hate speech laws in the *Criminal Code of Canada* which are considered by some to be a threat to freedom rights in Canada, see Greenspan (2004) and for a discussion of hate laws and academe, see Moon (2014).

As pointed out by Rowe and Brass, "Universities, as part of their remit as public organizations, encourage academics to disseminate their research, engage with communities and contribute to public policy formulation and debates" (2011, p. 3). However, "Speaking beyond academe though, especially when using the media technologies that are now readily available for instant, widely dispersed communication has its perils for academic staff and employers alike" (p. 4). A review of social media policies and/or guidelines for 29 universities across Canada revealed several commonalities. Paramount is the desire to promote the institution via social media. A representative example from the University of Guelph (2014):

> Social media continues to change the way we communicate—both as an institution and as individuals. Twitter, Facebook, LinkedIn, YouTube, Flickr and other social media sites allow us to create a dynamic Web presence for the University of Guelph and build valuable relationships with people around the world. The University of Guelph supports the use of social media by employees to achieve the benefits of global information-sharing and immediate feedback. Social media sites allow us to engage in ongoing "conversations" with our students, faculty, staff, alumni, parents, donors, colleagues, friends, fans and others about what is important to them. (para. 1)

These policies invariably provide guidelines for staff with respect to the use of social media, all of which are remarkably similar. The guidelines include language with respect to:

- Confidentiality, that is, the need to protect confidential information relating to the individual or institution, including employees and students;
- Transparency (or "authenticity"), that is, the need to disclose your institutional affiliation if posting or responding as an employee;
- Accuracy, that is, the need to verify information and sources;
- Respect, that is, the need to be respectful when posting and engaging with others;
- Copyright or confidential material, that is, the need to acknowledge and respect copyright and privacy laws;
- Privacy, that is, the need to protect personal information.

There is also recognition in a number of the guidelines examined that employees will use social media as individuals, in addition to or as opposed to on behalf of the institution. To that end some guidelines, such as those posted by Simon Fraser University (2012), advises employees to post a disclaimer such as the following:

> A common practice among individuals who write about the field in which they work is to include a disclaimer on their site, usually on their "About Me" page. If you discuss higher education on your own social media site, we suggest you include a sentence similar to this:

> The views expressed on this [blog, website, forum] are mine alone and do not necessarily reflect the views of Simon Fraser University. (para. 2)

However as pointed out by O'Neil (2008b), distinctions between "appearing to speak for or represent the institution on the one hand and, on the other, speaking only as an individual" become "blurred in cyberspace" (p. 181). The Simon Fraser University guidelines acknowledge this, stating "Be aware that if you identify your affiliation with SFU, readers will associate you with the university, even with a disclaimer that your views are your own" (Simon Fraser University, 2012, para. 3). They also warn about legal liability:

> You can be held legally liable for what you post on your site and on the sites of others. Individual bloggers have been held liable for commentary deemed to be copyrighted, defamatory, libelous or obscene (as defined by the courts). Employers are increasingly conducting web searches on job candidates before extending offers. Be sure that what you post today will not come back to haunt you. (Simon Fraser University, 2012, para. 1)

Several institutional guidelines examined expressly mention academic freedom. At the University of British Columbia (2014a), for example, the guidelines state:

> These guidelines are intended to encourage faculty to engage in social media, not to interfere with or restrict academic freedom in any way. As with all communications at UBC, your right to academic freedom is limited only by the university's respectful environment and harassment and discrimination policies. (University of British Columbia, 2014b, para. 1)

Similarly the guidelines at Carleton University (2014) state:

> Carleton University is committed to academic freedom of speech. These guidelines are intended to assist you in your professional use of social media and to remind you to consider your reputations and Carleton's when sharing information. (para. 7)

Perhaps the guidelines which are most reflective of the potential risks and ambiguities posed by the use of social media by academic staff are those posted by Ryerson University (2014) under the heading "Social Media Use—the Employee Dilemma":

> For most employees, there has been a fairly clear understanding that what you do on your own time is pretty much your own business. Employers may have some leeway to tell you how to dress or act at work in order to promote the culture and image of the organization, but when you are not working you are free to do and say whatever you like, right? Well, it may no longer be that clear cut. Facebook, YouTube, Twitter, cell

> phones with video capability, and other new media are changing the impact of what an employee says or does on their employer. With the advent of social media, employees' private lives are now exposed. And their employers may also be "exposed" by their employees on social media. Can an employee's posting on their Facebook page have an adverse effect on their employer? Recent examples indicate it can. (paras. 1 and 2)

These guidelines continue, "Since the law in this area is evolving, it is important for organizations to establish guidelines so that employees are aware of the potential impact of their social media behaviour," and conclude:

> Ryerson employees all have a role to play in the success of the University, and should understand the adverse effect that negative public actions and comments can have on our reputation. Prospective students and employees may be influenced by what they hear about the University on social media. At the same time, Ryerson is mindful of personal freedom and privacy rights and, for faculty, academic freedom. These issues will be considered starting this fall, so that the University can provide appropriate guidance to employees to prevent these kind of problematic situations. (para. 6)

The Ryerson University guidelines encapsulate the dilemma posed by social media. As Guistini (2013) writes:

> Since the 1990s, the emergence of blogs has brought with them all sorts of legal concerns around copyright, libel, slander, invasion of privacy, media ownership, election laws, licensing and vicarious liability (when employers are held liable for actions of their employees). Defamation is especially worrying … . Many organizations are developing social media policies to provide a framework for their employees who engage in social media. That said, it is advisable for all users of Facebook, Twitter and, more recently, Pinterest to read up on what the law says vis à vis the use of social media. Every profession should also provide some clear advice to their members about how to use social media responsibly and ethically, and outline the limits of free speech in the United States, Canada and elsewhere in the world. (p. 2)

Librarians in Canada would appear to have less protection against these kinds of actions than their counterparts in the United States. As cited by Siddiqui (2013) Franklin Carter, editor and researcher for the Book and Periodical Council's Freedom of Expression Committee says "It's possible to defame someone in the United States as well as in Canada, but the requirements for proving defamation in court differ in both countries" (paras. 3 and 4). Carter continues saying:

> In the United States, the burden of proof is on the plaintiff. You—the plaintiff—must prove that the defendant published a false and injurious statement about you. If you're a public official or a well-known figure, you must also show that the defendant acted with malice when he or she published the defamatory statement. In Canada, the burden of proof is on the defendant. You—the defendant—must prove that you did not publish false and damaging remarks about someone's reputation. You must prove that your facts

> are true and that your opinion could be held by anyone. You have a few other defences as well. In a U.S. court, it's hard to prove defamation. In a Canadian court, it's hard to defend against a defamation lawsuit. So, if a plaintiff has a choice of jurisdiction, he or she will probably sue in Canada. (Siddiqui, 2013, paras. 3 and 4)

This is supported by Brian MacLeod Rogers, lawyer for Askey, who told *Library Journal* in an interview:

> In Canada, even in libel cases involving public figures and matters of public interest, the onus remains on defendants to prove a defense for any defamatory statement they have published; its falsity and damage are presumed. While defamation defenses have greatly improved in Canada over the past five years—thanks to our constitutional equivalent of the First Amendment for protecting free expression—it is up to defendants to show that: contentious facts are true; any defamatory opinions are ones a person could honestly hold; or they were "responsible" in publishing what they did. (Schwartz, 2013, para. 7)

Per Schwartz, Rogers continues, "In the United States, section 230 of the Communications Decency Act essentially provides immunity from defamation claims for publishing someone else's posts online—not so in Canada where there remain many murky areas in determining liability for Internet postings and applying traditional common law concepts" (para. 8).

A recent and troubling development that should be noted are the social media guidelines issued by the University of Kansas which have serious ramifications for academic freedom. As reported by the AAUP (2013a), "On December 18 the Kansas Board of Regents adopted new rules under which faculty and other employees may be suspended, dismissed or terminated from employment for 'improper use of social media'" (para. 1). As pointed out by this policy AAUP does not distinguish between professional communications and personal communications and they have condemned the policy "as a gross violation of the fundamental principles of academic freedom that have been a cornerstone of American higher education for nearly a century" (para. 2).

It unclear what the import or force of a disclaimer is and whether it serves to indemnify the institution and/or the individual. In the Askey case McMaster University in Ontario, Canada was held responsible for the comments posted by Askey on his blog while he was employed at Kansas State University in the United States. Guistini (2013) writes,

> Even if you go to the effort of crafting a disclaimer, you are not indemnified from someone taking legal action against you for making statements on your blog. By using such phrases as "it is my opinion that" or "I believe (though I can't be sure)" won't protect you either if what you say is libelous and can be proven as harmful to another person's reputation or business. (para. 2)

The effect that these kinds of lawsuits have on a personal and professional level cannot be underestimated. "It feels like a violation of my freedom of expression, as well as an infringement upon academic freedom, which has a slightly different nature," Askey said of the lawsuits:

> Were he to prevail with his lawsuit against me, it would set a negative precedent for anyone upset with a librarian who expresses a grounded professional opinion. Libel litigation is not a useful forum for academic or professional disagreements. The costs involved create an unbalanced playing field and those without extensive means are, by default, at a major disadvantage. (Marchildon, 2014, para. 7)

In 2013, AAUP produced a revised version of the Association's 2004 report *Academic Freedom and Electronic Communications*, reaffirming "that report's 'overriding principle: Academic freedom, free inquiry, and freedom of expression within the academic community may be limited to no greater extent in electronic format than they are in print, save for the most unusual situation where the very nature of the medium itself might warrant unusual restrictions'" (AAUP, 2013b, para. 2). The question remains, when it comes to defamation or libel, will the institution come to the defense of academic staff? Even before the advent of the use of social media platforms, there have been cases in Canada, such as that at York University, where the university initially refused to come to the assistance of an academic staff member being served with libel notices citing that the University's insurance did not "indemnify faculty members who spoke to the media on matters relating to their research, teaching and professional activities" and that these activities were "voluntary" and existed outside the scope of professional responsibilities (Dimock, 2004, para. 2). When the lawsuit against Askey first became public McMaster University "affirmed 'the right of the academic community to engage in full and unrestricted consideration of any opinion,' and stated it will defend itself, but said nothing about defending Askey" (CAUT, 2013, para. 8). It was only after considerable pressure from CAUT and outcry from the professional and academic community that McMaster University agreed to ensure that Associate University Librarian Dale Askey could cover "his anticipated legal costs in defending himself against the defamation suits filed against him by Edwin Mellen Press and its owner" (CAPAL, 2013a).

IX. Professional Concerns in Canadian Universities

Despite the growing use of social media and networking platforms by institutions in higher education and their staff, 36.10% ($n = 74$) of respondents in the survey undertaken for this analysis did not know if their institution

Table 2
Use of Social Media and Networking Tools

Social media/networking tool	*n*	Percentage of total responses
Blogs	53	23.56
Facebook	127	56.44
Twitter/micro-blogging tools	111	49.33
Networking sites (i.e., Academia.edu, LinkedIn)	81	36.00
YouTube	30	13.33
Do not use social media	54	24.00

$N = 225$.

had any guidelines for academic staff with respect to the use of social media/networking tools and/or sites. Meanwhile 48.29% ($n = 99$) of respondents indicated that their institution did not have any guidelines. Only 15.61% ($n = 32$) were aware that their institution had social media guidelines. What does this tell us? It suggests that neither Canadian universities nor academic librarians have seriously considered the ramifications of the use of new technologies for academic staff. Several respondents noted "best practices" were in place "but not a uniform approach," that the institution had "been slow to develop policies in this area," and another stated "in development but not targeted at one staff group."

As is illustrated in Table 2 when participants in the survey were asked which social media tools and networking sites they used, the most common and popular was Facebook followed by Twitter. It has been suggested that the "phenomenon of mini-blogs" (i.e., Twitter) has replaced "essay-type" blog posts (Aharony, 2009a).

When respondents were asked if they identify themselves on social media, 53.21% ($n = 83$) indicated they did, although the comments revealed that not all identified their affiliated institutions. A personal pride in professional identity in these forms of communications outweighed the need to state their institutional affiliations. It was more important to be part of a larger professional network that extended beyond their institutions. Respondents were more likely to identify themselves on Facebook, usually because of the privacy settings, and on networking sites such as LinkedIn and Academia.edu given the nature and purpose of these sites. Meanwhile 28.85% ($n = 45$) of respondents indicated they sometimes identified themselves, while 16.03% ($n = 25$) indicated that they did not.

One of the ways to distance personal viewpoints from being interpreted as your institution's perspective, as recommended by many institutional

social media guidelines, is to use disclaimers. The survey indicates that 79.49% ($n = 124$) of respondents did not use disclaimers. Only 10.9% ($n = 17$) of respondents stated they used a disclaimer, and 7.05% ($n = 11$) indicated they did sometimes. This suggests an area which needs to be examined, not only in terms of best practices but also to what extent disclaimers offer legitimate protection for individuals. It may be that academic freedom protection offers provides librarians a false sense of security in these circumstances. Some felt that when postings originated from a personal Facebook account, they would only be interpreted as personal and hence not viewed as conflicting with their employer's views. Others believed that this should be completely obvious, that "anyone's opinion on their personal social networking site is indicative of their own views and not their institution." But is this really the case? Those who were aware of a need for a disclaimer included them on their blogs and even in the signature of their e-mails. Several respondents indicated in the comments that they had never even considered posting a disclaimer. Generally, however, only 35.05% ($n = 54$) felt free to express critical viewpoints relating to their work and role as a librarian on personal social media sites. Meanwhile 32.47% ($n = 50$) did not feel free to openly express these viewpoints on social media and 25.32% ($n = 39$) indicated sometimes. When asked to elaborate on their response to the question about expression of critical viewpoints using social media, many respondents indicated fear of repercussion not only from within the institution but also concern about professional reputation, comments being taken out of context as well as fear of libel. Meanwhile several respondents said that they felt free to criticize external professional issues, that is, government policies, and another stressed that the public's "right to know" as most important.

As is illustrated in Table 3 when Canadian academic librarians were asked to rank and prioritize considerations when expressing critical views relating to their role and work as a librarian using social media/networking tools and/or sites freedom of expression ranked highest followed by privacy.

When asked if the possibility of being sued for defamation or libel impacted how they use social media and networking tools, 57.24% ($n = 87$) said no, 26.97% ($n = 41$) indicated yes, and 13.16% ($n = 20$) responded sometimes. When asked to elaborate on their response several respondents expressed an "awareness and understanding of libel," and the need to avoid expressing opinions that might be "construed as defamation/libel." One respondent indicated:

> Part of my research is threatening to a large Canadian organization that is very litigious. Twice I have been named in demand letters by them. The 2nd time, my university asked me not to speak in public about this organization for a while.

Table 3
Considerations When Expressing Critical Views Using Social Media and Networking Tools and/or Sites

Considerations when expressing critical views	Percentage of total responses (*n*)		
	Very	Somewhat	Not at all
Freedom of expression	55.2 (94)	36.09 (61)	8.28 (14)
Fear of defamation/libel	32.94 (56)	38.82 (66)	28.2 (48)
Privacy	52.07 (88)	39.05 (66)	8.88 (15)

$N = 170$.

Again several respondents stressed the importance of the "public good" as illustrated by the following comment:

> I choose to be responsible in what I say and will be critical but back up criticisms with arguments, other publications, data, etc. I am unafraid of defamation for these reasons and although I am aware of defamation suits, I feel knowledge and information is critical to a functioning democracy.

Only 3.33% ($n = 5$) of respondents indicated that they had removed content from social media/networking sites because of fear of legal action, and 2.65% ($n = 4$) reported that they had been asked to remove comments. However, self-censorship has clearly resulted since the Beall case came to light. For example, the following comment by a survey respondent confirms that this has had an impact on freedom of expression among librarians:

> … there was a time when we were going to publish information online about predatory journals and just before we did a librarian who was already doing it got sued. This stopped us in our tracks and we have actually submerged the information.

Lastly, respondents in the survey were asked who at their institution "is responsible for defending and covering the legal costs of academic staff accused of defamation that arises from the performance of academic activities." The survey responses indicate that 70.59% ($n = 44$) did not know, 18.63% ($n = 38$) believed it would be the faculty/academic staff association, and 8.33% ($n = 17$) thought it would be the institution. Several respondents displayed an astute understanding of the lack of clarity around this and the accompanying risk. One respondent wrote:

> There is no one body responsible; it is does on a case by case basis. We have had many cases recently. One the union paid for. One the institution paid for. One CAUT paid for. It depends on how important the case is to each group.

And another eloquently summarized the dilemma as follows:

> The current Executive of our Association (academic staff) has stated many times that it will defend our academic freedom. The resolve to do so sometimes falters depending on the case and who is staffing the Executive at the time. And it is unknown if that resolve extends to legal costs although the Association is a contributor to the CAUT Academic Freedom Defense Fund. That said, in one case I know about, I believe the individual was left on their own to fight a libel suit.

X. Conclusion

The intent of this enquiry was to assess the current status of academic and intellectual freedoms as they are understood by academic librarians in Canada and enshrined in legislation and institutional collective agreements. This analysis revealed a number of concerns which need to be collectively shared and addressed within the profession of academic librarianship. Technology has redefined the landscape professionally. We have a responsibility to understand the contexts in which we work within our communities. As discussed, legislation does exist in the Canadian Constitution which offers the protection of fundamental freedoms. However, the issue of how comprehensive or far reaching these rights are within academic communities, given our new technologies, has not been fully tested, especially with respect to the rights and freedoms of professional academic librarians and the use of the new social media platforms. This accounts for a great deal of the uncertainty today. Our study revealed a lack of awareness and understanding on the part of Canadian academic librarians regarding their rights and protections with respect to academic freedom. The use of new communication technologies by Canadian academic librarians poses new challenges and risks which appear to be not fully understood. Areas that would benefit from further investigation and not explored in this study include how social media tools and/or networking platforms are used by academic librarians to express critical viewpoints and to what extent this use is protected by individual institutions and/or unions or associations. The blurred lines between personal and professional blogs and other social media platforms is an area that has not yet been fully examined. While the status of academic librarians will vary by institution and the protections provided for academic librarians with respect to academic and intellectual

freedom will vary by jurisdiction the issues raised by this chapter transcend boundaries. The authors of this chapter believe it is in the interest of professional academic librarians everywhere to ensure that they acquire and/or become knowledgeable about their academic rights and freedoms, from the perspective of their own workplace, as well as, be informed of fundamental, given rights wherever they may reside. For knowledge of these rights empowers, just as it facilitates discretion and protection when expressing viewpoints, no matter the medium. It enables strategic choices when facing challenges and assures that the fundamental rights are not forfeited when negotiating terms of employment.

Unlike many of their American colleagues, most academic librarians in Canada are members of the faculty associations which are also certified unions. The national survey undertaken for this study demonstrates that academic librarians, when covered by the same academic freedom statements as their faculty colleagues, whether stated in combined or separate collective agreement documents, are assured of better protection than librarians who are not included in faculty policies who would appear to be more vulnerable. This is professionally significant. Academic freedom is a given, a core requirement for academic librarians everywhere, as is tenure which, in turn, secures this right. Academic librarians must have the freedom to function as full members of their academic communities which includes the right to criticize, disseminate and share views and professional expertise within and outside their academic institutions. What is at stake is the ability of librarians to enact the core professional values of librarianship and the freedom to fulfill their professional obligations in support of the public good in a democratic society without fear or repercussions.

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Appendix A

Table A1
Collective Agreement/Memorandum of Agreement for Librarians

Name of institution	Collective Agreement (CA)/ Memorandum of Agreement (MOA) year	CA or policies for librarians only (yes or no)	CA or MOA for librarians and faculty (yes or no)	Academic freedom statement (yes or no)
Acadia University	July 1, 2010—June 30, 2014	No	Yes	Yes
Athabasca University	Terms and Conditions: July 1, 2011—June 30, 2013 Salaries and Benefits: July 1, 2010—June 30, 2012	Unclear	Unclear	Unclear
Atlantic School of Theology	April 1, 2010—March 31, 2013	No	Yes	Yes
Bishop's University	July 2012—July 2015	Yes	No	No
Brandon University	April 1, 2011—31 March 31, 2015	No	Yes	Yes
Brock University	July 1, 2011—June 30, 2014	No	Yes	Yes
Cape Breton University	July 1, 2009—June 30, 2013	No	Yes	Yes
Carleton University	May 1, 2012—April 30, 2014	No	Yes	Yes
Concordia University	2012—2015	No	Yes	Yes
Dalhousie University	2011—2014	No	Yes	Yes
Guelph University	Expires June 30, 2014	No	Yes	Yes
Lakehead University	September 1, 2011—August 31, 2015	No	Yes	Yes
Laurentian University	July 1, 2011—June 30, 2014	No	Yes	Yes
McGill University, Faculty Association[a]	—	Unknown	Unknown	Yes (?)
McMaster University, Librarians Association[b]	2011—July 31, 2015	Yes	No	No

Table A1 (*Continued*)

Name of institution	Collective Agreement (CA)/ Memorandum of Agreement (MOA) year	CA or policies for librarians only (yes or no)	CA or MOA for librarians and faculty (yes or no)	Academic freedom statement (yes or no)
Memorial University of Newfoundland	February 26, 2010—August 31, 2013	No	Yes	Yes
Mount Allison	September 2012—August 2015	No	Yes	Yes
Mount Saint Vincent University	July 1, 2012—June 30, 2015	No	Yes	Yes
Nipissing University	May 1, 2012—April 30, 2015	No	Yes	Yes
Northern Ontario School of Medicine Faculty and Staff Association	July 1, 2011—June 30, 2015	No	Yes	Yes
Nova Scotia College of Art and Design	July 1, 2012—June 30, 2015	No	Yes	Yes
Queen's University	August 29, 2011—April 30, 2015	No	Yes	Yes
Royal Roads University	April 1, 2012—March 31, 2014	No	Yes	Yes
Ryerson University	Expires June 30, 2015	No	Yes	Yes
Simon Fraser University[c]	See note below	No	Yes	Yes
St. Francis Xavier University	Expires June 30, 2016	No	Yes	Yes
St. Mary's University (Nova Scotia)	September 1, 2012—August 31, 2015	No	Yes	Yes
St. Mary's University College (Alberta)	July 1, 2013—June 30, 2015	No	Yes	Yes
St. Thomas More College	2010—2013	No	Yes	Yes
Trent University	July 1, 2012—June 30, 2013	No	Yes	Yes
University of Alberta	2010—2013	Yes	No	Yes
University of British Columbia	July 1, 2012—June 30, 2014	No	Yes	No
University of Calgary	July 1, 2013—June 30, 2015	No	Yes	Yes
University of Lethbridge	Effective July 1, 2013 (no end date is listed)	No	Yes	Yes
University of Manitoba	April 1, 2010—March 31, 2013	No	Yes	Yes
University of New Brunswick	2009—2013	No	Yes	Yes
University of Northern British Columbia[c]	July 1, 2010—June 30, 2012	No	Yes	Yes

University of Ontario Institute of Technology	Expires June 30, 2015	No	Yes	Yes
University of Ottawa	May 1, 2012—April 30, 2016	No	Yes	Yes
University of Prince Edward Island	Expires June 30, 2016	No	Yes	Yes
University of Regina	2011—2014	No	Yes	Yes
University of Saskatchewan	2010—2013	No	Yes	Yes
University of Toronto[a] (U of T has a Memorandum of Agreement with Administration which has a clause on academic freedom)	1978	No	Yes	Yes
University of Victoria[d]	July 1, 2010—June 30, 2012	No	Yes	Yes
University of Waterloo[a]	2010	Yes	No	No
University of Winnipeg	April 1, 2010—March 31, 2013	No	Yes	Yes
Western University	July 1, 2011—June 30, 2015	Yes	No	Yes
Wilfrid Laurier University	July 1, 2011—June 30, 2104	No	Yes	Yes
Windsor University	July 1, 2011—June 30, 2014	No	Yes	Yes
York University	May 1, 2012—April 30, 2015	No	Yes	Yes

[a]Universities with Faculty Associations that are not certified as unions.
[b]McMaster University Librarians' Association is certified. The Faculty Association at McMaster University is not certified.
[c]Recently certified their faculty association.
[d]University of Victoria Faculty Association Council voted to pursue certification on April 23, 2014.

Appendix B: Canadian Academic Librarians Academic Freedom Survey

Questions Used from the Survey

1. Which of the following best describes your status?
   - Contractually limited
   - Probationary/Pre-tenured/Pre-continuing appointment
   - Tenured/Continuing Appointment
   - Permanent staff without tenure or continuing appointment
   - Other (Please specify)

2. Which of the following best describes the status held by librarians at your institution?
   - Academic status (analogous terms and conditions of employment as teaching faculty)
   - Faculty status (same rights and privileges as teaching faculty)
   - Academic staff (no academic or faculty status)
   - Don't know
   - Other (Please specify)

3. Which of the following best describes the situation of librarians at your institution?
   - Members of a certified trade union/certified faculty association that includes faculty and librarians
   - Members of a certified trade union/certified librarians association that includes only librarians
   - Members of a noncertified faculty association that includes faculty and librarians
   - Members of a noncertified association that includes only librarians
   - Are not members of any kind of union, association, etc.
   - Don't know
   - Other (Please specify)

4. Does your institution have a formal statement regarding academic freedom?
   - Yes
   - No
   - Don't know
   - Other (Please specify)

5. If yes, where is this statement made available? Please check all that are applicable.
   - Institution web site
   - Collective agreement
   - Memorandum of agreement
   - Don't know
   - Other (Please specify)

6. If yes, does this statement cover and protect librarians?
   - Yes
   - No
   - Don't know
   - Other (Please specify)

7. I feel free to openly criticize the policies of the library, institution, and administration
   - Yes
   - No
   - Sometimes
   - Not applicable

   If you responded No or Sometimes, please elaborate.

8. I feel free to express my views within the institution in speech, writing, and through electronic communication without fear of sanction.
   - Yes
   - No
   - Sometimes

   If you responded No or Sometimes, please elaborate.

9. I feel free to express my views outside the institution in speech, writing, and through electronic communication without fear of sanction.
   - Yes
   - No
   - Sometimes

   If you responded No or Sometimes, please elaborate.

10. Does your institution provide guidelines for academic staff with respect to the use of social media/networking tools and/or sites?
    - Yes
    - No
    - Don't know
    - Other (Please specify)

11. Please describe these guidelines and indicate where they are made available.

12. Do you use any of the following social media/networking tools as an individual (as opposed to on behalf of the institution) to post/share comments and/or opinions relating to your work as a librarian? Please select all that are applicable.
    - Blogs
    - Facebook
    - Twitter/Micro-blogging tools
    - Networking sites (i.e., Academia.edu, LinkedIn)
    - YouTube
    - Do not use social media
    - Other (Please specify)

13. Do you openly identify yourself as a librarian and include your institutional affiliation on the social media/networking sites indicated in the previous question?
    - Yes
    - No
    - Sometimes
    - Other

    Please elaborate on your response above. If Yes, why? If No, why not? If Sometimes, when and why/why not? If Other, please specify.

14. Do you post a disclaimer on these social media/networking sites which makes it clear that the views are your own and not that of your institution?
    - Yes
    - No
    - Sometimes
    - Other

    Please elaborate on your response above. If Yes, why? If No, why not? If Sometimes, when and why/why not? If Other, please specify.

15. Do you feel free to openly express critical views relating to your work and role as a librarian on social media/networking sites?
    - Yes
    - No
    - Sometimes
    - Other

    Please elaborate on your response above. If Yes, why? If No, why not? If Sometimes, when and why/why not? If Other, please specify.

16. How important are the following considerations when you express critical views relating to your work and role as a librarian when using social media/networking tools and/or sites?

	Very	Somewhat	Not at all
Freedom of expression			
Fear of defamation/libel			
Privacy			
Other (Please specify)			

17. Does the possibility of being sued for defamation/libel impact how you use social media/networking tools and/or sites?
    - Yes
    - No
    - Sometimes
    - Other (Please specify)

    If Yes or Sometimes, please describe how this impacts your use of social media. If Other, please specify.

18. Have you ever removed comments you posted on social media/networking sites in relation to academic activities because of fear of legal action?
    - Yes
    - No
    - Sometimes
    - Other (Please specify)

    If Yes or Other, please elaborate.

19. Has anyone ever recommended that you remove comments posted on social media/networking sites in relation to academic activities because of fear of legal action?
    - Yes
    - No
    - Other

    If Yes, please elaborate and indicate who recommended that you remove the comments. If Other, please specify.

20. Who at your institution is responsible for defending and covering the legal costs of academic staff accused of defamation that arises from the performance of academic activities?
    - Institution
    - Academic staff association/union
    - No one is responsible
    - Don't know
    - Other (Please specify)

21. Please feel free to provide any additional comments.

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Educating Ethical Leaders for the Information Society: Adopting Babies from Business

Maureen L. Mackenzie
Division of Business, Molloy College, Rockville Centre, New York, NY, USA

Abstract

The boundaries between the for-profit sector and traditional nonprofit library focused information professions are blurring. As these information professions grow, more of their future leaders will be graduates from business management programs as opposed to library and information programs. There is a general perception that for-profit employers demand leaders who are analytical and achievement oriented. As a result, business schools have been criticized for focusing their curricula on transaction-based economics with less focus on preparing leaders to do what is right. So, how do we better prepare business graduates to face ethical dilemmas as they move forward to build and support information organizations of the future? This chapter reports the results of a study which explored the viewpoints of American thought leaders about ethics in the context of business programs. A total of 32 subjects from the corporate and higher education settings were interviewed. Results of the study revealed five major themes related to how educators can better prepare our next generation of leaders. Those themes were: (1) insights related to the student; (2) insights pertaining to the goal of business ethics education and curricula; (3) specific cases and experiences to include in ethics course(s); (4) explicit student learning outcomes; and (5) the specific role, skill, and ability of professors teaching ethics courses. While this chapter deals primarily with the academic scope of ethics, the study also explored personal views about ethics by the interviewees. Understanding how foundational ethical beliefs and awareness develop then informs the broader discussion of ethics.

Keywords: Business ethics; ethics; leadership preparation; organizational culture; information culture; business education

I. Introduction

Volume 39 of *Advances in Librarianship* illuminates hot issues in the broad field of information. Ethics, education, and leadership are among those

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issues. The American Library Association (ALA), within its code of ethics, addresses the "importance of codifying and making known to the profession and to the general public the ethical principles that guide the work of librarians, other professionals providing information services, library trustees and library staffs" (1996–2014). ALA's code of ethics speaks directly to ethical decision making and its back story reflects the shift in a librarian's expected behavior from "should" to "must" (Sturgeon, 2007, p. 56). Its language reflects a fabric of ethical thinking that defines ALA and its members. Though the code has been revised over time, it has been suggested that its foundation and fabric is solid (Buschman, 2006). It is understood that ethical behavior and ethical decision making is present at all times.

Many professions have enforceable codes of ethics, such as doctors and lawyers. In these fields, individuals who violate their codes of ethics can lose their license to practice. It is generally acknowledged that a profession is partially defined by its ability to self-govern. An ethics code makes known a profession's stance and commitment to society. The ethics code can "include a means by which the members of the profession ensure compliance with the responsibilities they profess." According to Stichler (1992), "… if occupational groups lack effective means of self-governance, they are not qualified to call themselves professions" (pp. 41–42).

Sturgeon (2007) pointed out that the ALA lacks any such mechanism to enforce its code of ethics. He cited a survey of Illinois public library directors and found that only little more than half of the respondents (56%) even knew that the code of ethics existed. A related debate is the effectiveness of a code in influencing behavior. Some feel that codifying ethics helps to raise awareness and reduces opportunities for individuals to claim that they didn't know of a code's existence. Others think that codes make little or no difference (Brinkmann & Peattie, 2005). Lere and Gaumnitz's study (2003) found that the presence of a code is more influential on behavior when there is an enforcement provision.

A. The Information Field

Disciplines such as knowledge management, information policy, information storage and retrieval, knowledge archiving, searching and indexing, and web development, all live within the purview of both for-profit and not-for-profit organizations. The ALA accreditation standards defines the phrase "library and information studies" so that it is clearly

> understood to be concerned with recordable information and knowledge and the services and technologies to facilitate their management and use. Library and information studies

> encompasses information and knowledge creation, communication, identification, selection, acquisition, organization and description, storage and retrieval, preservation, analysis, interpretation, evaluation, synthesis, dissemination, and management. (ALA, 2008. Standards for Accreditation of Master's Programs in Library and Information Studies, p. 3)

In reflecting on this definition, we know that many industries emerge from, or heavily rely upon, the information professions. Therefore its integrity must be solid. Information is pervasive and the processes that exist in this country connect us all and that the boundaries between the for-profit sector and the information professions are blurring.

So, how do we ensure that future leaders are able to face the ethical dilemmas that they will face as they move forward to build and support information organizations of the future? This is especially true when the leadership of our information infrastructure is not emerging solely from ALA accredited institutions nor is it within traditional library environments. It is difficult to argue that the world of business and the world of information are separable. Future information leaders will emerge in increasing numbers from graduate and undergraduate business schools rather than traditional, library and information science programs, or even from I-schools. It is from the viewpoint that business management schools will have a growing influence over the information professions, that the overall purpose of this study emerged. Another premise is that organizational cultures are pervasive and are influential in shaping employees' behaviors and can empower employees to make reasoned and ethical decisions that benefit stakeholders. Yet, it is also understood that an ethical culture emanates from its leaders. It starts at the top; or does it? Or does it start in the home or during the formative years of professional development. Or does it start while the leader is still a student—at college?

This chapter offers readers a glimpse into the minds of those who are already embedded in senior leadership levels at a range of organizations. The glimpse speaks to how they perceive the development of ethical decision making within organizations and their views of factors influencing those cultures. The outcome is knowledge about how future leaders can be best, or better, prepared to face the dilemmas that organizational life present. Prior to seeking the empirical data, knowledge of the major concepts surrounding this topic must be considered. Therefore, this chapter describes both published views and research results relating to the five following areas:

1. The influence of workplace ethics and business practices;
2. Ethical information culture;
3. How students learn ethics;
4. What employers expect from graduates; and
5. What business management programs seek to teach and to achieve.

These knowledge areas provide the context for the empirical study reported in this chapter. In short this chapter explores the question of how colleges and universities can prepare future leaders to face ethical dilemmas effectively. The knowledge and experiences captured from experienced leaders and corporate designers of ethics' programs, offers direction to everyone responsible for the development of coursework within the management and leadership curriculum.

II. Literature Review

A. The Influence of Workplace on Ethics and Business Practices

There is a social contract between a business and the consumer. There are also societal expectations that as an organization grows, it will assume greater social responsibility for the society from which it profits. Society allows organizations to exist if the quality of their products are valued by consumers. This good will must be earned. It is also expected that an employee whose personal life and work life finds balance within an ethical culture, will in turn provide fair and honest quality of service to customers (Goveas, 2011). A leader's actions and values also impact the employee's ethical choices (Soutar, McNeil, & Molster, 1994). The larger the organization is in size and structure, the more rigid its mechanistic structure may be. As a result, there are higher levels of ethical formalization and utilitarianism (Schminke, 2001). One truism is that the work environment in which an employee works has an influence over his or her behavior. Lere and Gaumnitz's study (2003) found that the presence of an ethics code that indicates ethical/unethical behavior does not impact the choice made by the individual, unless the code's presence changes the person's beliefs, which will then change the ultimate action. For example, if an employee has no opinion about the ethics of a situation, then a code will be more influential. An important insight from this research described in this chapter is that an enforcement position tied to the code, can discourage unethical behavior because of a penalty. The penalty may be embarrassment or the loss of his or her ability to work in a profession. Research suggests that organizational culture is influential and a "sense of common purpose among members of the organization" is effective. So are promoting values such as reporting unethical behavior, enhancing the reputation of the profession and its importance within society; and explaining why certain behaviors are wrong. Employees should also have a workplace or outlet to gain support when pressured to behavior unethically (Lere & Gaumnitz, 2003).

True familiarity with a code of ethics has been shown to influence management behavior. A study of 286 executives by Wotruba, Chonko, and Loe (2001) revealed that if a positive perception of the usefulness of the ethics code existed, a manager would more fully understand the content and intention of the ethics policies and codes. With understanding, comes the ability for the code to influence the person's belief, thereby influencing the person's behavior.

B. The Ethical Information Culture

A society must have confidence in the information upon which it builds its systems and decisions. Information ethics is an essential component of our society which includes: the ethical use for information; confidence in the processes and technologies that both gather and disseminate that information; as well as how it is analyzed and stored. Yet defamation, identity theft, piracy, fraud, and corporate sabotage, are often in our news and their losses are substantial. Also, although organizations continue to build stronger security systems, unethical actions targeting our information system, still remain (Chieh-Peng & Cherng, 2003).

A study of 500 undergraduate students in an information systems department at a Taiwanese college explored the influence on personality (locus of control) in an institutional setting. Briefly Chieh-Peng and Cherng found that ethical intentions are influenced by both personal values and ethical attitudes. They suggested that ethics codes would provide clear guidance, as well as clarity about penalties for its violation. Relating to the organizational culture, their results found that individuals must be encouraged to report any unethical incident. Pre- and post-testing found that ethics training can improve behavior. Most important, they found that employee selection is the most important factor and that by selecting individuals with strong ethical intentions unethical behavior will be reduced.

Cleek and Leonard (1998) challenged the accepted assumption on the influence of a code of ethics upon behavior. Their research revealed that "codes of ethics are not powerful enough tools to affect ethical decision-making behavior" (p. 627). Why?

> They argued that a code is meaningless unless the organizational culture communicates, values, and reinforces the spirit of the code. The code is used to strengthen the culture and therefore it is not the codes themselves that are important, but how the management of the business reacts to ethical decisions as a whole. Thus, codes are just one way of communicating an ethical culture to employees. (p. 627)

C. How Students Learn Ethics

1. Working Experience

Meaningful work influences "excellence pursued within social practices," because it helps the individual find fulfillment and completion (Beadle & Knight, 2012, p. 434). More relevant is the positive relationship found with work experience and ethical judgment (Gupta, Walker, & Swanson, 2011).

Ausmus (2006) asserted that a young person's (16–17 years of age) first job had traditionally provided a rite of passage that included expectations related to honesty, dependability, and an eager commitment to work. For teenagers there often was a related perception of increased freedom and a social transition toward adulthood. But the well-meaning intentions of parents to provide their teenagers with an enriched school experience that includes travel and in-school activities, engendered an expectation that the need to work was unnecessary, or even a barrier to a more fulfilled childhood. Ausmus suggested that the impact of this shift caused more affluent and gifted youth to avoid traditional teenage experiences of any kind of labor. A potential entitlement attitude may lead young adults to lack the traditional development wherein their self-interest was aligned with the interests of employers. This parenting intervention suggests an attitude of, "my child's self-interest trumps every other consideration here" (p. 2C). Ausmus questions how these individuals will respond when faced with a collision of their own interests against those of stockholders, investors, and the greater social good. He concluded by saying "some other folks with incredibly high self-esteem faced those critical junctures—and they're currently serving time for massive fraud schemes that bilked millions of employees and investors out of their life's savings" (p. 2C).

2. College Experience

Stewart, Felicetti, and Kuehn's (1996) research found that business majors valued the presence of ethics within their programs. Blending ethics into a number of courses across the curriculum appeared to be more attractive than separate stand-alone courses. Duarte (2008) found similar results with 95% of the 119 business management students surveyed saying that they "believed that the study of ethics in management is important, and that they had personally benefited from studying ethics in the subject surveyed (84 percent)" (p. 120). The hard push for business ethics coursework is considered to be the direct result of abuses in industry. A 1988 AACSB survey had indicated that 91% of responding institutions had at least one course with at least 10% of its class time devoted to ethics. The study

further reported however that at the undergraduate level, 56% of the offered ethics courses offered were solely elective (Stewart et al., 1996). The shift to increase ethics coursework was embraced by student business majors who thought "it was important to teach business ethics, that ethical practices improve profit, return on investment and the corporate culture and public perception of the organization" (Stewart et al., 1996, p. 916). Duarte (2008) reported that student insights related to whether or not economic performance should come before ethical behavior. The results suggested that there is a gap "between the ideal of ethics and the perceived difficulty—for some the impossibility—of achieving it in professional practice" (p. 125).

Thus conflict between individual professional versus personal responsibility emerged. Duarte (2008) wondered how students can be trapped in this dilemma so early in their professional journey. Her review of the data suggested that students did not condone economic choice over ethical choice, but "were merely expressing their (somewhat cynical) perceptions of the 'business world,' and hoping that 'society' would intervene to force business to behave more ethically" (p. 126). She concluded that "ethics teachers have a crucially important role to play in order to persuade students that their individual voices do count in the shaping of more humane and equitable managerial practices—in the creation of a better society" (p. 127). Capturing the views of students further down the path, Verschoor (2003) reported on a study of 1700 master of business management students from 12 prominent business schools. The outcome reflected concern by students that their business education did not prepare them for the conflicts they were facing in the workplace. Though blame was placed on personality and character of the leaders involved in corporate scandals, Verschoor concluded that the business priorities communicated in their colleges and universities were among the factors leading to the occurrence of scandals per se.

D. What Employers Expect from Graduates

As previously noted general perception is that employers demand leaders from business schools who are analytical and achievement oriented, with focus on the bottom-line. As a result, schools have been criticized as focusing their curricula on "transaction-based economics, economic liberalism, or agency theory," with less focus on preparing leaders for doing what is right and instilling "norms of ethical behavior that would have prevented major corporate debacles" (Cavico & Mujtaba, 2009, p. 2).

When senior leaders were asked what skills they most desire in young leaders joining their firms, they included such expectations as social graces, getting along with coworkers, the ability to blend-in seamlessly, the ability

to speak with ease and to maintain a good attitude (Gottlieb, 2004). Self-reliance skills are also highly valued. Employers expect that newly graduated hires can hit the ground running. The skill of self-promotion can be tied to the ability to blend-in seamlessly. Consistently, employers desire communication and interpersonal skills, which support the ability to "approach stressful situations such as giving presentation, handling negotiations, leading a team or social networking events" (What do bosses expect, 2008).

Perhaps business schools have misunderstood employers' desires, focusing too heavily on the analytics and less on leadership and ethics. Employers have articulated an expectation and desire for graduates who embrace an ethical focus within the workplace (Gottlieb, 2004). The purpose of the business school is to create value for its stakeholders, which include both students and employers (Cavico & Mujtaba, 2009). Organizations are expected by society to behave responsibly. Therefore employers "expect and demand that business schools facilitate the training of students in ethics and social responsibility" (Nicholson & DeMoss, 2009, p. 213).

Studies that cite ethics education have often drawn conclusions from master's program data. Much less is known about undergraduate education. Also, research results have revealed that a significant percentage of students have self-reported on having cheated in school. This can create concern among employers in that business students "take what they learn in college—both good and bad—to the workplace" (Nicholson & DeMoss, 2009, p. 214). Therefore the need to embody ethics education into the preparation of leadership is a priority.

III. What Are Management Programs Seeking to Achieve?

A report of the Association to Advance Collegiate Schools of Business International (AACSB) stated that "business schools are vital societal institutions that create value in a myriad of ways. Ample evidence is presented that dismiss the sometimes cited critical perception that business schools exist exclusively to serve profit-seeking businesses or salary-minded students" (AACSB International, 2010, p. 3). Embracing the perception that program graduates are not to be solely focused on profit seeking, but rather serving a broader societal purpose, makes it intuitively easy for curriculum gatekeepers to establish ethics as an essential building block for student learning. It also recognizes that individuals emerging from these programs will actively engage in the many information professions that fuel our nation's economy. As influential as AACSB is upon management and

business education, there are no explicit standards for the student learning outcomes related to ethics. The AACSB has supported the inclusion of ethics courses since the early 1980s, but it has been noted that many schools did only the minimum to satisfy this expectation (Luthar & Karri, 2005, p. 357). Jennings (2004) stated that there had been "very little in textbooks and mandates from the AACSB focusing on moral absolutes or 'bright line' virtue ethics such as honesty, fairness or even false impressions in financial disclosures" but rather that the curriculum "trained students in the importance of smoothing out earnings so as to maximize shareholder value, the often-stated role of business" (p. 13).

Nicholson and DeMoss (2009) surveyed Deans of AACSB schools in North America. Their results revealed a difference in the perceived importance of ethics and social responsibility education between business disciplines. Management and marketing faculty rated social responsibility and ethics significantly higher than did accounting and finance faculty. Also, when faculty who have not been traditionally prepared are pressed to include ethics content in their coursework, only minor inclusions take place with no real structure to focus on ethics content.

Regional accrediting authorities, such as the *Middle States Commission on Higher Education* (MSCHE), expect academic institutions to establish evidence of student learning related to institutional stated program goals and expected learning outcomes. It appears to lack consensus as to the role that ethics education plays according to Nicholson and DeMoss (2009). Does it "make the workforce more honest?" or "teach people to think for themselves?" Shaw and Fisher (2012) questioned whether teachers are to focus on the discipline using theory and then expect students to apply the theory, or is the use of case-study review a better strategy?

Some authors have suggested that business schools have served as a negative influence on business leaders with too much focus on analytical skills, teaching the brightest minds how to cut corners to manipulate the bottom line and gain a competitive advantage, and that this contributed to the downward spiral of corporate leaders' unethical behaviors (Cavico & Mujtaba, 2009; Heller & Heller, 2011; Mitroff, 2004; Zingales, 2012). Brinkmann and Peattie (2005) said that business schools are simply reflecting the business world. They debated "whether the pervasively amoral stance encountered in business drives or reflects the tendency to teach business from an amoral perspective" and that "business school teaching tends to be amoral to the point of brutishness" (p. 152). Even education on economic theory may distance an individual from acknowledging the influence of his or her ethical choices (Zingales, 2012). Brinkmann and Peattie (2005) point to the economically rational decision-making techniques taught in business schools

as being applied to such events as the Ford Pinto fire deaths, and that cost benefit analysis led the company to "put corporate profit before customer safety" (p. 154). Heller and Heller (2011) on the other hand, thought that business schools are not to be held accountable for the ethical, financial, and economic crisis but that lack of individual character is the cause. Milner, Mahaffey, MacCaulay, and Hynes (1999) found that business students scored lower on ethical scales coming *into* school than did nonbusiness majors, suggesting a bias in who chooses to pursue a business degree, rather than a negative influence emerging from the business curriculum. Regardless of cause, corporate scandals, disappointment in board oversight, the increase in regulatory oversight, reach of the global market, criticism of scholars, and the increased focus on corporate social responsibility have collectively placed renewed focus on business ethics (Jackson, 2006).

A review of 50 ethics courses by Heller and Heller (2011) at AACSB accredited undergraduate programs revealed that course content does include, though inconsistently, four needed areas: (1) the responsibility of business in society, (2) ethical decision making, (3) ethical leadership, and (4) corporate governance. But they suggest that "added emphases is needed in the classroom to raise students' awareness of the importance of a broader horizon of ethical issues confronting the workplace and society" (p. 34). Other authors mentioned the need for foundational ethics training such as ethical egoism, utilitarianism, morality, and philosophy that would lead individuals to greater self-reflection (Cavico & Mujtaba, 2009; Jennings, 2004). Advocates argue that business schools should build upon these foundational philosophies with the goals of instilling moral conflict (disagreements related to questions of right and wrong), moral role playing (to influence moral view), moral climate (shared perceptions of the ethics policies in an organization), and, reflection and self-criticism (awareness, sensitivity, and courage). Such education would provide future leaders with a "mature and comprehensive toolbox of practical ideas to promote moral development, ethical behavior, and moral conflict management within business organizations." It would invite the future leader to "slow down and disconnect from the busy-ness of commercial life, and to spend some time reflecting about the conditions and consequences of one's life" (Brinkmann & Peattie, 2005, pp. 151–152). Whether educational scholars agree or not, employment in either the for-profit or nonprofit sector is among the desired outcomes of a business student's education. An ethical perspective in business is essential because of its overwhelming influence over wealth allocation in our society and the livelihood of our citizens (Brinkmann & Peattie, 2005, p. 154). Therefore the views and expectations of employers are valuable inputs as faculty builds program curricula.

IV. The Research Project

The review of the literature reflects upon what employers expect and need from their newly graduated future leaders, coupled with how and what students learn within their college experience. There does not appear to be strong alignment, perhaps because the long view of what is taught today and how it will influence our society in the future is unclear. Therefore the purpose of this research is to create a stronger congruence starting with the student's college experience and leading to a clear preparation to enter into industry with the tools, knowledge, and disposition needed for ethical decision making. For the college experience to properly prepare the student, the curricula designers need to more fully understand what future employers will expect. Thus the data gathered comes directly from those who manage ethics programs at the organizational level coupled with the most senior of leaders who have personally walked this path. Also, insight is drawn from those who study ethics as a scholarly profession. By triangulating the viewpoints of three different groups of subjects, stronger insights can be drawn as to how educational institutions can best prepare the next generation of leaders. In summary, the purpose of the study is to gain insight from experienced and practicing industry leaders, experts in the field of corporate ethics, and philosophy/ethics scholars, as to the value and purpose of ethics education.

A. Methodology

A qualitative paradigm provides an effective approach to drawing out the knowledge and insight, which is bound within the content of the captured data. The qualitative research approach seeks rich data rather than consensus. The use of unstructured interviews allows the researcher to participate in the research (Lincoln & Guba, 1985). Qualitative researchers are "interested in meaning—how people make sense of their lives, experiences, and their structures of the world" (Creswell, 1994, p. 145). Outlying subject comments provide insights that lead to clearer understanding of the topic. To reduce research bias, triangulation included subjects with varying professional positions as related to this topic. Therefore, this study uses qualitative methods to capture and analyze the data. An interview schedule, given in the appendix, guided the interviews with the subjects.

B. Subjects

The subjects were selected based on their knowledge and ability to thoroughly inform the purpose of this study. The population from which

the subjects were selected included individuals who were senior corporate leaders, ethics scholars, and leaders of corporate ethics program. A purposive subject selection was partially accomplished using a sample of convenience coupled with a snowball method, which allowed one subject to recommend another subject. The Molloy College Institutional Review Board has approved the method underlying this study and the researcher's interaction with the Human Subjects.

A total of 32 subjects were interviewed from five US states (IL, NY, NJ, FL, HI). The subjects lived primarily in NY and IL (43.8% from NY; 40.3% from IL). Thirty-four percent (34.4%) of the subjects were women. 90.6% of the subjects are currently married with children. The subject groups were comprised of 22 senior line leaders, 5 ethics scholars/philosophers, and 5 corporate ethics program directors/leaders. The line leaders were very senior in rank. 68.2% of the line leaders held officer level positions, defined as a Vice President, Sr. Vice President, President or C-level officer. Four of the subjects held positions as President or CEO. The subject group was mature with an overall average age of 51 years. The average age of 51 was consistent across the subject groups except for the ethics' scholars, whose average age was 54 years. A more descriptive breakdown of the subject demographics is reported in Table 1.

C. Data Collection

The data were collected using one-on-one in-depth interviews. The interviews were conducted face-to-face except when a subject was unable to meet. Four interviews were therefore conducted by phone. The goal was to

Table 1
Subject Characteristics

	Senior line leader	Corp. ethics director/leader	Ethics scholar	Total
Number of subjects	22	5	5	32
Age range (years)	32–57	47–62	41–65	32–65
Average age (year)	51	54	51	51
% of subjects with an earned MBA or doctorate	68.20	100	100	78.1
% of subjects married with children	95.4	100	60	90.6
% of female subjects	31.8	60	20	34.4

research a level of saturation to the point of discovery of repetitive themes. Once themes became repetitive, a level of confidence was derived with both breadth and depth. Thirty-two in-depth interviews were conducted, recorded using a digital recorder, and subsequently transcribed. Open-ended questions allowed each subject to express his or her views, experiences, and opinions related to the topic.

A schedule with 10 interview questions, and an 11th catch-all opportunity question, was created (see the appendix) to explore how future leaders could best be prepared to face the dilemmas that employment in organizational life will present to them. The questions also addressed what employers expect from graduates, and ultimately, what should business management graduate and undergraduate programs teach and design, if the views of future employers are important variables.

The study design was intended to draw insights from those at the senior leadership level in organizations. Capturing the knowledge and experiences of in-force leaders, supplemented with the views of the corporate designers of ethics' programs, offered direction to management curriculum designers. To gain a balanced view of this topic, insight was also drawn from those who study and teach ethics as a scholarly profession at the college level.

The interview questions fell into two categories—primary or *academic* and secondary or *personal*. Within the academic scope were included questions directly related to the college processes by which students are prepared for job placement. As seen in the appendix, the questions included ones which probed—such as whether colleges are doing a satisfactory job in preparing graduates to face ethical dilemmas, and what are the expected learning outcomes of an ethics course?

Questions in the personal category explored the subjects' personal views of various facets of business ethics. These insights will inform the academic scope as it illuminates the corporate culture. The interviewees were asked to share their own journey in gaining an education in ethical decision making. Also, the subjects' opinions were captured related to whether people have an ethical nature, or whether their ethical viewpoint is created from experiences.

D. Data Analysis

Content analysis was the method used to systematically reduce the data. The researcher, as observer and co-participant, became immersed in the data, which is a feature of qualitative research. Themes were built through a repetitive process of identifying the smallest groupings of data (e.g., words

and sentences) and then through constant comparison revising the conceptualized categories, which then served as the research outcomes for the study (Lincoln & Guba, 1985). NVivo content analysis software was used to organize the coding of the data elements, which allowed themes to be drawn out more effectively.

V. Results

Though the actual intention was to ask questions sequentially, the open-ended nature of the questions encouraged subjects to elaborate on points, thus, in many instances particular questions were answered in the context of others. Nonetheless, the protocol ensured that all the questions were addressed. Therefore the themes drawn from the interviews were studied aggregately within the scope of two categories described above—the *academic* and the *personal.* Data analysis followed these steps:

1. Verbatim comments from the one-on-one interviews were transcribed.
2. Paragraphs and sentences were used as the units of analysis. For the *academic scope*, this first level of compression answered, "What is the subject expressing related to the academic scope of business education related to ethics?" For the *personal scope*, this first level of compression answered, "What are the personal insights that these individuals are willing to share related to their real-world exposure to ethical and/or unethical corporate experiences?" (See the appendix for schedule of interview questions.)
3. The second level of compression articulated the themes emerging from the different sets of questions, that is, *academic and personal scopes*. The outcome of this created a consolidated view of the themes that offered direction to the creators of management curricula on how educational institutions can best prepare the next generation of leaders.

A. Results for the Academic Scope

The major and minor themes drawn from the interviews related to *academic scope* are summarized in Table 2. The themes were organized into five major categories:

1. Student-related insights;
2. Insights related to the goal of the business ethics education curricula;
3. Specific cases and experiences to be included in ethics course(s);
4. Explicit student learning outcomes. Specifically what is intended for the student to learn, know, or do, as a result of taking ethics during a program of study; and
5. The specific role, skill, and ability of the professor teaching the course.

In addition to presenting the results of the five major theme categories (see Table 2), quantitative descriptive answers drawn from three questions below begin to frame the value of why educational institutions need to

Table 2
Major Themes Focused on Academic Scope

Insights related to the student
People are set in their ways
People do not always think before they act
Influence of upbringing, culture, and experience
Insights related to the goal of the curriculum
Not to teach ethics, but rather to sway or influence the student
Promote awareness and sensitivity of an ethical dilemma
Teach strategies related to defining, reasoning, and decision making
Reflect the big picture; position situations within that scope
All courses must reinforce ethics; general education sets the foundation
To develop courage in the student
Specific cases and experiences to be part of ethics education
Banking and finance Industries as well as successful cases such as Tylenol
Global and social responsibility
Industry specifics related to degree focus
History of ethics including theories and the voices of leaders
Influence of organizational culture on people, dissent, and behavior
Student learning outcomes from ethics education
Able to articulate the reason for a decision
Able to identify various options and the resulting consequences
Able to persuasively and communicate both verbally and in writing
Insights related to the role of the professor
Presence in the classroom is essential; perceived as a role-model and expert
Must challenge the student
Must be skilled at teaching skills; must be an attentive listener

refocus their approach for preparing our next generation of leaders. The qualitative insights from the interviewees comments tied to these three questions were integrated into the major themes, which are more fully reported later in this section.

"*Do you feel that ethical behavior can be taught at the college-level?*"

Six of the subjects (18.8%) responded "no" to this question. Two offered qualitative comments to moderate their "no" answer. The good news is that 26 subjects (81.3%) responded "yes" suggesting a level of confidence that ethical behavior can be taught at the college-level. All of the Ethics Program Directors responded "yes," with four of the five ethics scholars answering yes. Nineteen (86%) of the 22 line managers responded with some form of "yes." Shurden, Santandreu, and Shurden's (2010) research on student perceptions support this finding indicating that "ethics can be taught, and that instructors have an impact on the ethical values that

student's carry with them into the business world" (p. 124). The subjects who responded "no," expressed comments that pushed this role back into the individual's home life or upbringing.

Verbatim subject comments included:

- "You must first learn it from your mom and dad. You need to know by five, definitely by 7, the age of reason."
- "What you can't do is change the fabric of the people; by the time you get to college it is already instilled in them."

The "yes" comments were presented with caution, as reflected in these verbatim comments:

- "I think it can be taught to a certain degree."
- "The answer is yes, to some degree."
- "I guess yes."

"*What is the value of an ethics course; is there value?*"

Twenty-seven (84%) of the subjects responded "Yes" to this question. Many of these comments offered some qualifying suggestion that would create the value. For example:

- "The students should know the ethical and regulatory features of that field."
- "I think it should provide an awareness of expected behavior and what the team means."Only one subject responded, "No," stating that, "… business will talk about social responsibility, but profit is number 1. The ethics programs that are in place are because someone screwed up."

"*Do you feel colleges have done a sufficient job in preparing its business graduates to face ethical dilemmas?*"

None of the subjects responded "yes" to this question. The answers ranged from "no," to "don't know," to "some." Verbatim comments included:

- "I do think in school it is de-emphasized."
- "Looking at all the things going on in companies, I would say, no."
- "No, generally not."
- "Based on my observations, I would say no."
- "If we open the newspapers, the answer seems to be no."

There were sentiments expressed that schools are trying to change. This reflects the view that things had been bad, and that perhaps the academy is on the road to improvement. These sentiments suggest that the academic culture is beginning to take its role of preparing managers to face unethical challenges seriously. This brings us to our major and minor themes (see Table 2) related to the academic preparation of our future leaders.

1. Insights Relating to Students

Insights related to students were intended to make it clear to educators that when adults enter college, they have already been heavily influence by their parents, home-life, religion, upbringing, culture, and more. The moral fabric of these individuals is somewhat formed by this point in their

development. These findings heavily influence the next four themes because the goals of the curriculum, the cases to be presented, what is expected to be learned, and the role of professors, all need to be understood after achieving a better understanding of the students' beliefs.

In quotes below the parentheses reflect the category of the subject who was quoted, but which may have been reflected in quotes by other interviewees. Specific comments that reflect the evidence for these insights included:

- *People are set in their ways*:

> You can talk about decisions or ethical behaviors; but, we have found that many students come with a preconceived notion, a preconceived standard. (*Scholar*)
>
> You can have discussions and go over cases, but what you can't do is change the fabric of the people; by the time you get to college it is already instilled in them. (*Leader*)
>
> … in terms of moral character, you're probably set by the time you're 7 years old. You're not going to go back and undue some of this genetic makeup and the first 7 years of parenting. So, there is no way you're going to make them a radically different person … You have to be realistic about how much you can achieve. (*Scholar*)

- *People do not always think before they act*:

> Can you change how they will behave? If you look at psychology, generally people don't go through a lot of abstract reasoning before they decide what to do. Therefore, it is not surprising that changing their abstract reasoning does not have a lot of influence on changing their behavior.(*Scholar*)

2. Insights about Goals of Business Ethics Education

Once the student is more fully understood, then the goals of the curriculum related to the needs of the corporate world can be designed. The following insights weave together the desired outcomes of education with the input of the individuals being influenced. Accepting that student are not being explicitly trained, but rather, are being influenced or "swayed," allows for a more realistic expectation of learning outcomes.

The subjects in this study stated that the future leader needs to be highly aware and sensitive to potential ethical situations. An organizational or industry culture can suppress or disable this sensitivity. As a result, individuals may not even see the ethical dilemma, or may not question what should be explored.

Curricular goals need to consistently seek to influence adult learners to be sensitive to their environments. All coursework, starting with general education classes, must integrate and communicate awareness of such goals. This repetitive strategy will better sway or influence students, thereby

preparing them for subtle yet real-world situations. The curricular goals should not be too narrow or adult learners may miss the learning opportunity. The learning space must reflect the big picture and explicitly position the questionable ethical situations with that larger frame. Influencing students to question perceived unethical situations with confidence is among the more difficult curricula goals. Strategies for defining what is questionable, developing a critical view, and being able to reason, and to have a framework for making a decision will provide students with the confidence to speak up. Courage, the ability to question colleagues and superiors about a less than clear situation, is an expressed goal for student learners. Subjects cited courage as a critical ingredient in developing an ethical business environment.

Specific comments that reflect the evidence for these insights included:

- *Influence rather than teach*:

I think people come with their own dispositions; but, you can sway them, impress upon them. Don't just say, "be good." There are solid reasons for doing something. You come to realize it is in your best interest to behavior ethically. (*Leader*)

- *Promote awareness and sensitivity*:

you must understand where the grey is within the grey. How do you operate in the grey? How do you identify the grey? (*Corporate Ethics SVP*)

must recognize when there is a dilemma. You must understand that the world is not black and white. But you should see where the lines are. If you are in doubt as to whether a course of action is wise, decide if you can defend it in the public venue … you must be honest with yourself. Often we are lazy. (*Leader*)

Sometimes there are things that they need to be aware of; the rights of minorities; issues of gender, issues of disability, sometimes they just haven't thought about these things. So to discuss them makes them much more aware. (*Scholar*)

- *Teach strategies related to defining, reasoning, and decision making*:

You can tell people what ethical behavior is; you can give them a description of ethical behavior. Define ethical behavior. You can get them to identify ethical behavior. You can get them to be quite good at identifying what people should do, given different scenarios. In that sense, you can change how they will behave. It is a different skill set. (*Scholar*)

Give students an opportunity to build a professional responsibility muscle and to be able to apply it. (*Ethics Director*)

There is a difference in bending rules and breaking rules. You are not going to be squeaky clean. But you need to know where the hard stop is. (*Leader-COO*)

- *Develop courage*:

Possibly there is a notion that to be successful in business you must be cut throat. That is important for young people that you can be successful while being ethical." (*Leader*)

If someone else is doing something wrong, how do you exit a situation that you know is wrong? (*Leader*)

Not being fearful of retaliation. When you look at other companies, like WorldCom, you have people that don't want to speak up. You must be able to stand on your own values. Even if you manager's manager is doing wrong, stand up and speak up. (*Corporate Ethics Director*)

Provide a guideline on how to push back when you really have a strong passion. (*Leader*)

- *All courses must reinforce ethics; general education sets the foundation*:

… anywhere you talk about profit, there should be an ethical component. If you are talking about management, there is an ethical implication. If you're talking about marketing, you can weave it in there. (*Leader*)

3. Specific Cases and Experiences to be Included in the Ethics Education Course(s)

Respondents identified a wide range of events, companies, and personalities that could be used to illustrate both extremely positive and negative corporate behaviors. Analysis indicated that storytelling is essential, but said that the stories should relate to the recent financial crisis. Cases related to the banking and finance industries should be included as well as classic cases such as Enron and Tylenol. Students should learn industry-specific stories that relate to the field they want to enter professionally. In addition, cases should focus on responsibility in a global economy and on social responsibility. Also, the invisible influence of organizational culture must be made known so that students are aware of the impact it can have on people. Future leaders must have the courage to invite dissent into the decision process. Lastly, students must understand how their own behavior influences employees within an organization.

Specific comments that reflect the evidence for these insights included:

What if there are multiple legal opinions and multiple ways to interpret their actions. If you can pull them into the grey, there is not enough learning where the individual is exposed to the grey, where they feel icky, where they really feel "that this isn't easy." "This makes me feel uncomfortable." (*Leader-President*)

Reinforcing the importance of debate, dissent, and respectful disagreement. … even if it goes against your own beliefs. (*Corporate Ethics Director*)

Fundamentally there is a disconnect between business and ethics; but throw the individual into as many situations where they are up against the profit motive and the implications to making an ethical decision. Anything that simulates this kind of challenge is of importance. (*Leader*)

4. The Explicit Student Learning Outcomes

Learning outcomes indicate what the student should learn, know, or be able to do, as a result of taking these courses. The compression of the data revealed three essential learning outcomes for the student's educational ethics experience. They were:

1. The ability to articulate the reason for a decision. Understanding the influencing factors and having the ability to explain why those factors led to the decision, is an essential skill for a future leader.
2. The future leader must be able to consider an ethical dilemma and to identify various options along with the potential resulting consequences that may result from each potential path.
3. The future leader must demonstrate persuasive and clear communication skills. Leadership communication creates a vision for followers; it provides specific direction when action is needed.

Comments that provided evidence for these insights included:

- *Able to articulate the reason for a decision*:

Generally, if it is true dilemma, there is no easy way to have a clear right and wrong. They must understand both sides. (*Ethics Scholar*)

Being ethical is also being able to explain, "why." (*Leader*)

People tend to be tongue-tied when it comes to explaining. Being able to explain, giving reasons for their action. (*Scholar*)

- *Able to identify various options and the resulting consequences*:

Being able to weigh the options; being able to spell out which options are better. Why is this course of action reasonable, stronger than others; even if there is no absolute right answer? (*Ethics Scholar*)

How do you analyze situations and information so that you understand what information should be gathering; what questions I should be asking as I arrive at the solution? (*Corporate Ethics SVP*)

- *Able to persuasively communicate both verbally and in writing*:

How do we ask a question to determine the best way to get the answer? How do you ask the right type of follow-up questions to get the information you need. … prod for additional information so you get what you need. (*Corporate Ethics SVP*)

They should know how to have a difficult conversation using a personal script, so they can raise the ethical issues without damaging their long term career prospects. (*Corporate Ethics Director*)

5. Insights Related to the Specific Role, Skill, and the Ability of Professors

The classroom combines the talents of the professor with the knowledge artifacts, and the students' active engagement with the material and each other. The outcome created provides for an effective learning environment. The professor is the independent variable in this equation. Both the presentation of the knowledge artifacts and the motivation for student engagement is dependent on the ability of the professor. The professor's active presence in the classroom and his or her skills must challenge the student. The professor must be perceived as both a role-model and subject matter expert. Lastly, professors must be attentive and active listeners so they can respond to various views and provide "push-back" related to stories of unethical corporate and individual behaviors.

Comments that provided evidence for these insights included:

- *Presence in the classroom is essential. Must be perceived as a role-model and expert by the student*:

The way you present yourself; not just in appearance, but do you care about what you are doing? Do you walk the walk and talk the talk. (*Leader-VP*)

I think more than anything, being a role-model. … watch their professors as role models for guidance. (*Ethics Program Director*)

The professor must take the time to research and then understand the true pertinent information from the industry. (*Leader*)

- *Must challenge the student*:

… to be able to put themselves as the moral agent within the context of that history; to identify that ethics is all around them. (*Ethics Scholar*)

You must challenge them to think broadly, about profit and loss. (*Leader*)

- *Must be skilled at teaching skills. Must be an attentive listener*:

The professor is to expand the classroom learning with real-life and real-world situations. (*Leader-President*)

Constantly putting things in front of their students that they can understand as what is "acceptable." What is acceptable for one is out in left field for others. (*Ethics Program Director*)

B. Results for the Personal Scope

While this chapter deals primarily with the *academic scope* of ethics, the study also explored the subjects' personal views relating to ethics. Collectively, the subjects' personal stories illuminate the various ways a person's own ethical fabric is developed. Understanding how foundational ethical beliefs and awareness develop informs the larger discussion of ethics.

The open-ended questions allowed each subject to share stories of a personal nature. Questions asked the subjects to share their personal journeys to gain an education in ethical decision making.

The major and minor themes drawn from the interviews related to personal scope are summarized in Table 3 and cluster into three major categories: (1) the influence of home and religion; (2) influences outside of the home; and (3) the nature of the individual.

1. The Influence of Home and Religion

Earlier in this chapter there was discussion of whether or not ethics could be taught at the college-level. What emerged there suggested that people are already set in their ways by the time they reach college due to the influences of upbringing, culture, and experience. This theme is reinforced here. The influence of religion was not as heavily shared when the question focused previously on academic scope. When probing the personal views however, religious influence was more prevalent. Since this personal view question came later in the interview, it might be inferred that the subjects had become acclimated to talking to the researcher. Mother was cited more

Table 3
Major Themes Focused on Personal Scope

The influence of home and religion
Parents behaviors and articulated lessons
The home environment related to community
Influences outside of the home
Influence of the job, workplace, and boss
Social influences such as LBGT, minority, race
Teachers
The nature of the individual
Dysfunctional nature
Functional nature

often than parents or the father. When the father was cited, it was often related to his role in society or lessons that he, the father, had taught.

Verbatim comments that illustrate this theme included:

- *Parent's behaviors and articulated lessons*:

Foundationally it comes from my Christian faith. (*Leader*)

For me, it started in my home. That is where. My father was a NYS trooper. So I grew up in a very structured environment. I was the oldest of 3 boys. I was taught that it is better to tell my parents the truth. If I lie, it will always come out. (*Leader-CFO*)

My mother is an incredibly accepting, not just tolerant, but respectful person; always bend over backward to help other people, to a fault in her case. So I have observed a lot of that and learned what not to do also. Her generous spirit and recognition that we are all fragile as human and may be deserve other chances sometimes. I think she's inspired a lot there. (*Ethics Scholar*)

It is your parents. They were together till we were 20. It is what you teach to your kids; it is what we are teaching to our kids. (*Ethics Director*)

- *The home environment related to community*:

Growing up in Troy … . There was a great deal of prejudice. I was blessed by parents who were not. (*Ethics Scholar*)

I was brought up in the catholic ghetto. I went to catholic HS and 3 catholic graduate schools. Ethics was a part of my education from grade 3. (*Ethics Scholar*)

I learned the most important things from the farm. In that environment, your word is your bond. If you say you're going to do something that is what you do. (*Leader-President*)

2. Influences Outside of the Home

Respondents also told stories of the influences that moved beyond their parents, childhood home, and religious community. It started with teachers and then led into the larger diverse community and then to the job, work environment, and the influence of bosses. Interaction between the outside world, and the parents' reactions to that world, were present in this theme. How teachers behaved, such as the story of the teacher who publicly humiliated first graders who "told on" fellow students, left lasting imprints on these subjects. The teacher's lesson that being a tattle-tale was worse than the crime being committed was easily translated into the challenge we have in speaking out against a coworker or a boss who is unethical. Early career jobs and bosses also influenced these subjects on how to behave, both negatively and positively.

Verbatim comments that illustrate this theme included:

- *Influence of the job, workplace, and boss*:

It is a combo of environment—early in my career I was fortunate to be working with some people who had good ethical values. I've also learned from people who are not as straight and narrow as far as ethics. (*Leader-President*)

I have found that if you place people into situations where they have to constantly choose between their best interests and something that is deemed right, other than their best interests, a vast majority of the people, over time, will move toward what is in their best interest. (*Leader-President*)

- *Social influences such as LBGT, minority, race*:

We may focus on promoting women. But people of color, we have a lot of people of color at the entry level, but not at higher level. Also, LBGT, do you make everyone feel they are welcomed? We DON'T have diversity of thought. (*Leader*)

But there was a great deal of prejudice against minority people and people who were not in the same socio-economic status. So when I got into graduate school, I felt myself being very interested in ethical questions, but the other graduate students were not, at all. (*Ethics Scholar*)

- *Teachers*:

If something reported on wrong doing, "Joann pulled my hair," the first thing she would do would be to go to the cat tale, write your name on it and hang it on the cat tale. She was teaching us to not be a tattle tale. This was first grade. … If you call them all tattle tales and put their names on the board, that behavior gets built into norms very very early. (*Leader-President*)

3. The Nature of the Individual

This final theme that emerged focused on people just being born a certain way. Though influences do direct, sway, and imprint people, we do have an innate nature. The comments referred to the good in all, and evil, that may not be changeable.

Verbatim comments that illustrate this theme included:

- *Functional Nature*:

I am more on saying that the ethical viewpoint comes from experience. The strength to stand by that viewpoint is more internal to the individual. (*Leader-President*)

I think that people have an innate sense of justice and what is just. (*Leader-CIO*)

- *Dysfunctional Nature*:

Psychopaths tend to be born, rather than made. (*Ethics Scholar*)

C. An Ethical Disposition

The 10h interview question was neither integrated into the *academic scope*, nor the *personal scope*. The question was: "Should an ethical disposition be an admissions standard for incoming business students?" To provide some background on this question, there was evidence in the literature that incoming business program students score lower on ethics scales, when compared to nonbusiness students entering their fields of study. So, the underlying theoretical question that was presented to the subjects suggested: if we screen out individuals who have a less-than perfect ethical disposition, would we be able to change the culture of business in one generation?

An important outcome is that 84% of the subjects answered some form of "no." Simply, students with less than pristine ethical dispositions should be allowed into the business program and trained! This is in contrast to the insight that these same subjects feel that people don't change and that ethics education must focus on "influencing," and "swaying" our students rather than expecting a shift in the person's foundational ethical beliefs and behaviors. The results of this last inquiry suggest that educators must have faith; we must believe that ethics education can make a difference. Senior leaders, ethics scholars, and ethics program directors, collectively suggested that we need all types of people and that no one should be excluded. There was a segment of the subjects that suggested screening incoming students would be impractical due to the reliability and validity issues surrounding such tests; but the strongest theme that emerged was the need to allow those individuals who are attracted to the field of commerce, to enter. These individuals may be more practical and may be more fact-based. These are the reasons that these individuals are invited into leadership roles within the information profession. The verdict is that these people will be working in the field of business regardless of whether they earn an MBA; therefore it is more realistic to allow them into school, and then use all that we have as ethics educators to "sway" and "influence," their viewpoints toward ethical sensitivity, social responsibility, and the development of courage to stand up to unethical situations.

Verbatim comments illustrating this theme include:

> Many people who come to business school are "driven," seeking financial success. These people may not be going to business school with the professional intention of social responsibility. But it is the responsibility of the business program to understand that and to cater their program to "high ambitious" people. Show them that you can be successful and still make the ethical choices. (*Leader*)

> Screening people out, I think it would be an injustice. Some people may be skilled in business, but they are not skilled in ethics and applying ethics to business. They are weak on ethics. (Leader)

> No, this may be part of the behaviors that makes them successful in business; it may be the blinders needed toward ethical or moral obligations; so pre-screening them out of business school is not the answer. It is better to give them training and a marker to guide them. (*Leader-CIO*)

> I was thinking what goes into a person's decision to earn an MBA, "I am going to try and get ahead," "I am going to make money"… What we need to show this person is that you can get ahead by being an ethical person. Enough people have had gotten caught doing unethical things and the consequences are known. Ethics is an important part of the MBA. (*Leader-SVP*)

> It is our job to take the average student who is predisposed to business and to making money … . We are to take that student and move them beyond that narrow focus. Can we move them beyond the profit? Take the ordinary and average and transform them through the process of morale education. (*Ethics Scholar*)

VI. Discussion

A valued practice of qualitative researchers is to go back to the literature, after the data are analyzed and the themes allowed to emerge, to seek similar insights that can be weaved together. The findings of this study offered the ingredients that curriculum designers could use to build a more effective educational experience for future information leaders. The work of Razaki and Collier (2012), DesJardin, Ryan, Weber, and Wood (2006), Nicholson and DeMoss (2009), and Linberg and Modin (2013), all align with the findings of this study.

Razaki and Collier (2012) illustrate how a capstone course embedded within the business curriculum, especially for those focused on the analytical facet of business can provide a decision framework for students. Razaki and Collier specifically address: influencing the student; acknowledging the influence of upbringing, culture, and experiences; promoting awareness and sensitivity; teaching strategies related to defining, reasoning, and decision making; reflecting the big picture and positioning situations within that scope, integrating cases from the banking and finance industries; integrating specifics related to the degree focus; and expecting the student to be able to articulate the reason for making a decision.

Razaki and Collier's model offers a viable solution to educators, which directly align with the findings from the study reported in this chapter. A primary philosophy is that the material and exercises teach students moral agency; moral agency builds upon the individual's belief of what is right or wrong. It is the individual's behaviors or actions and how the person considers and accepts accountability related to these actions. Moral judgment

precedes the action or behavior. Razaki and Collier establish the learning objectives to include:

1. "the business world and business education are multidisciplinary in nature and should be dealt with on a holistic basis";
2. "unethical behavior on the part of various business professionals, especially managers, leads to long-term economic failures and fiascos"; and
3. "the proper functioning of capitalistic economies, specially the various securities markets, is dependent on the ethical and properly professional conduct of all parties participating in the national and global business enterprise." (pp. 3–4)

Below is a paraphrased summary of Razaki and Collier's (2012) educational model, coupled with the insights of how each step aligns with the study results reported in this chapter.

1. Establish a simple decision framework that includes (a) determination of legal versus illegal; (b) review of professional codes; and (c) introduction of the *newspaper* test (would you want to read your decision in the *New York Times*). DesJardin et al. (2006) also shared a viable decision framework: Determine factors, identify ethical issues, identify stakeholders, consider alternatives, consider how each decision affects stakeholders, seek guidance, and establish assessment of decision outcomes. These authors' strategies align with the reported research insights that students should be taught reasoning and decision-making strategies.
2. Students must articulate core values, which they currently hold as true that relate to economic life in the United States. The students must also identify from where those values emerged (e.g., parents, ethnic culture). This teaching activity aligns with the insight that home and religion are significant influences upon the student's values.
3. Introduce the students to the dominate value systems within the US economic and political systems. This strategy aligns with the influences upon the student emerging from outside of the home.
4. Introduce the concepts of libertarianism; what it means to be human, what is the relationship between the individual and the community; and "what is the purpose of the economy in light of various concepts of the 'good life'" (Razaki & Collier, 2012, p. 4). This step aligns with the range of experiences a student should be exposed to within an ethics course.
5. Students must reflect on their own values and determine how they are linked to the dominate values systems in the United States. This step aligns with the student's development of sensitivity.
6. Integrate a community-based service learning experience that offers an "opportunity to personally interact with students, non-profit employees and those seeking services at the non-profit. … From an ethics perspective it provides them with unplanned, complex, real-world examples of different types of ethical decisions" (Razaki & Collier, 2012, pp. 4–5). This step aligns with insight that students be exposed to global and social responsibility expectations.
7. Establish a dedicated module focused on the banking and finance industries with the goal to teach both moral hazard and information asymmetry. Information asymmetry is the imbalance in a transaction when "two or more parties transact while possessing unequal amounts of information about the situation at hand" (Razaki & Collier, 2012, p. 8). This step further supports the insight that the ethics experience must provide industry experiences.
8. Establish a dedicated module focused on the accounting and auditing industries with the goal of making clear the role of these professions to our society. Accountants and auditors' roles are, by their nature, ethics-based disciplines. A goal of this module is to shift the student's

> understanding of an accountant's role from blindly applying rules, to serving as an "information guardian that ascertains and disseminates relevant information that levels the unlevel informational playing field inherent in the presence of asymmetric information" (Razaki & Collier, 2012, p. 10). This step aligns with the insight that students must learn to see the dilemma when it presents itself.

To sum up, Razaki and Collier's (2012) model draws together the insights of the scholar, the demands of the industry, and the role of the future leader in creating a more ethical business environment.

A discussion of the stand-alone ethics course will further illuminate the results of the reported study; it is recommended that a stand-alone course exist, but it must be supported and reinforced by coursework throughout the curriculum. This insight is supported by scholars that include Brinkmann, Sims, and Nelson (2011), Cagle, Glasgo, and Holmes (2008), and Crane (2004), as cited by Linberg and Modin (2013). It is suggested that the foundational ethics course should be embedded in the general education program. Building upon this foundation, a stand-alone business ethics course should exist within the business curriculum; but, ethics should then be further supported and reinforced in the content-heavy business courses such as accounting and finance.

A literature search found alignment with this insight in Nicholson and DeMoss's (2009) research; they cautioned against including ethics in all content courses. The master's programs seeking to remain competitive have had to reduce the number of required courses, with the ethics courses becoming one of the casualties. The solution to spread the ethics content across all courses resulted in "the number of qualified faculty to teach the subject is inadequate. … the forecast is not particularly bright … without significant retraining of rank-and-file faculty members, who are underequipped to tackle ethics issues in their already-crowded courses." They further stated that when the faculty was pressed to include ethics in their courses,

> these faculty members provided minor inclusions but no real restructuring to include ethics and social responsibility topics. Furthermore, these faculty members may have resented being forced to change content or felt unqualified to instruct the material, and instead, they may have preferred that the material be covered in a course devoted to the topic.
>
> Nicholson and DeMoss (2009, p. 214)

The effort to triangulate in this study was supported by Linberg and Modin's (2013) research. They shared the successes of a program which integrated ethics concepts throughout the curriculum. The faculty within the School of Business & Technology at the College of St. Scholastica, Duluth, MN made the decision to come together for this common cause. Rather

than continuing their model of "each discipline operating as a silo; the team promoted the idea that ethical dilemmas should be integrated throughout the discipline-specific courses using problem-based learning" (Linberg & Modin, 2013, p. 2). This integration did not take place without dedicated effort and support. Initiative leaders conducted one-on-one interviews with faculty; they developed workshops to teach faculty how to embed ethics into coursework. The training included topics such as: integrating the ethics decision-making model directly into the syllabus, using ethical dilemma cases, introducing critical thinking skills, using role-playing, including guest speakers, and learning how to use library resources. A monthly Character Building Luncheon invited an alumna to present a moral dilemma that had been encountered in his or her workplace environment. Students would seek to solve the dilemma using their newly learned critical thinking framework (Linberg & Modin, 2013, p. 3). Finally the faculty established an assessment system within the Policy and Strategy course where the students would answer an essay question: "Based on what you have learned in this course and throughout your management education, describe at least three ethical dilemmas you may face in your management career and how will you address each dilemma?" The faculty evaluated these essays using an ethics rubric; 90% of the 2012 Spring students demonstrated proficiency or distinguished ability (Linberg & Modin, 2013, p. 5).

Linberg and Modin (2013) and Nicholson and DeMoss (2009) illustrate that the recommended strategy of spreading ethics teaching responsibility must be done with fore-thought, faculty acceptance, curriculum alignment, training, strategic design, and meaningful assessment.

VII. Conclusion

The purpose of this study was to give curricula designers insight and direction to create a clear educational path whereas the student's college experience would lead to preparation for entrance into industry with the tools, knowledge, and disposition needed for ethical decision making. The outcomes of this study included insight into the nature of the student, the goals of the ethic curriculum, the relevant content to be included in an ethics course, what is expected as to student learning, and what is the role of the professor.

In conclusion, it is the collective responsibility of business leaders and business educators to collectively guide students and emerging leaders to develop a strong sense of ethical awareness and sensitivity so that they may

face the dilemmas that will emerge in the workplace. These students must also be given the skills to analyze, understand, prevent, and resolve ethical dilemmas. And most important, these individuals must be encouraged to develop the courage to speak out against events that, unopposed, will lead to unethical outcomes and negative consequences.

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Appendix: Schedule of Interview Questions

Academic Scope

1. Do you feel that Ethical Behavior can be taught at the college-level?
2. What is the value of an Ethics Course; is there value?
3. What should be the expected *learning outcomes* of an Ethics course? What should a student be able to know or do after he or she has successfully completed a course in ethics?
4. Do you feel colleges have done a sufficient job in preparing its business graduates to face ethical dilemmas?
5. What experiences, cases, and concepts should an ethics course include?
6. What can college professors do, teach, say, offer, to help future leaders gain an ethical disposition?
7. We've discussed a stand-alone program. How do you feel, if you so feel, ethics should be integrated into the larger curriculum? Consider both the business courses and general education.

Personal Scope

1. Please share your own journey in gaining an education in ethical decision making. Where did you learn to identify ethical issues; to create an ethical culture?
2. Do you think that people have an ethical nature, or is their ethical viewpoint created from experiences?

Schedule of Interview Questions—Conclusion

1. Should an ethical disposition be an admissions standard for incoming business students?

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The Role of Librarians in a Knowledge Society: Valuing Our Intellectual Capital Assets

Denise A. D. Bedford,[a] Jennifer K. Donley,[b] and Nancy Lensenmayer[a]
[a]School of Library and Information Science, Kent State University, Kent, OH, USA
[b]Heterick Memorial Library, Ohio Northern University, Ada, OH, USA

Abstract

The transformation from an industrial to a knowledge economy and society are underway. In the knowledge economy, the knowledge of people and organizations—their intellectual capital assets—are the primary factors of production and the source of wealth. This is in contrast to other kinds of capital that fueled the industrial and the agricultural economies. Librarians have understood the knowledge society as one characterized by an increased focus on digital resources and an expanded use of virtual channels to deliver those resources. However, the nature of the knowledge society and economy is far more expansive than a digital environment. A knowledge society is one in which all members of a society engage in knowledge transactions—in the business environment, in the social sphere, in civic activities, and in everyday environmental actions. This view of the knowledge society presents new opportunities for librarians to leverage their intellectual capital. This chapter profiles the intellectual capital assets of librarians, considers how they align with professional competencies, and presents use cases that illustrate the value of these assets. Future scenarios illustrate how traditional functional competencies might shift in the knowledge economy. These also suggest contexts which highlight undervalued or new competencies. Seven observations describe how librarians might prepare for expanded roles in the knowledge society.

Keywords: Knowledge society; intellectual capital assets; future librarians; future scenarios; library science competencies; knowledge economy

I. Introduction

The transformation from an industrial to a knowledge economy is changing the internal and external working environments of the institution we have called a library for the past 250 years. This transformation influences what

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librarians do, how they work, where they work, how they are perceived, and what competencies they need to succeed in this new environment. This transformation can be viewed from two perspectives. The first perspective speaks to internal changes—the way the library and librarians work. The second perspective considers how changes in the external environment shift the role of librarians and information professionals. Both perspectives take the intellectual capital of librarians and information professionals as a focal point. This chapter describes the intellectual capital assets of librarians, and walks through scenarios that demonstrate how that capital can be leveraged in a knowledge society. The use case scenarios demonstrate the range of value librarians contribute to the knowledge economy.

II. Transition from an Industrial to a Knowledge Economy and Society

In the industrial economy, physical capital (land, equipment, buildings) and financial capital were the primary factors of production and the sources of wealth. In the knowledge economy, knowledge or intellectual capital is the primary factor of production and the main source of wealth generation (Carlaw, Oxley, Walker, Thorns, & Nuth, 2006). For the purpose of this research, we adopt Houghton and Sheehan's (2000) description of the knowledge economy. Houghton and Sheehan suggest that a knowledge economy is one in which knowledge is a key resource … one in which the generation and the exploitation of knowledge has come to play the predominate part in the creation of wealth. It is not simply about pushing back the frontiers of knowledge; it also about the more effective use and exploitation of all types of knowledge in all manner of economic activity.

Intellectual capital is knowledge that produces or creates value. It is an organization's source of competitive advantage and it is an individual's most valuable competitive asset (Amidon, 1997; Bounfour & Edvinsson, 2005; Edvinsson, 2002; Roos, 1998; Roos, Roos, & Dragonetti, 1998; Skyrme & Amidon, 1998; Stewart, 1991, 1997; Sveiby, 2000; Teece, 2000). An organization's intellectual capital includes its employees' knowledge, brainpower, know-how, and processes, as well as their ability to continuously improve those processes. Andriessen (2004) and Amidon, Formica, and Mercier-Laurent (2005) define intellectual capital to include (1) human capital—tacit knowledge and skills, and attitudes; (2) structural capital—culture, procedural knowledge, and explicit knowledge; and (3) relational capital—communication, knowledge and social networks, as well as overall

reputation and brand. Individuals have intellectual capital. Communities and organizations have intellectual capital, but only as aggregations of the intellectual capital of individuals. In order to succeed in the 21st century knowledge economy, cities, communities, organizations, households, and individuals must invest in, manage, and grow their intellectual capital (Amidon, 2012; Bontis, 2001, 2002; Bonfour & Edvinsson, 2005). In the 21st century, knowledge and intellectual capital will be the most important asset an organization can possess. This will be as true for libraries as well as for any Fortune 100 company. A library's intellectual capital is an aggregation of the intellectual capital of all of its employees. What does a librarian's intellectual capital consist of? Kostagiolas and Asonitis (2009) also leverage Andriessen's (2001) three categories of intellectual capital. In their work they provide a mapping of the intellectual capital assets of libraries to the three high level categories: human capital, structural capital, and relational capital. The work described in our chapter builds upon that work in three ways. First, it breaks intellectual capital assets down into the finer grained categories that are in use today in the intellectual capital discipline. Second, it focuses on the intellectual capital of librarians rather than libraries. Finally, it focuses on intangible intellectual assets rather than the mixture of tangible and intangible assets listed by Kostagiolas and Asonitis. For illustrative purposes Table 1 provides a breakdown and examples of librarians' intellectual capital assets. By taking a finer grained approach and focusing on librarians, a much richer picture of assets emerges. Table 1 provides examples that are referenced in the intellectual capital literature (Bedford, 2011, 2013a).

What is notable about these examples is the scarcity of references to the collections of information resources that librarians manage. That is because those resources are not considered to be the intellectual capital of libraries, but rather the intellectual capital of the individuals who created them. The explicit and encoded resources that libraries manage fall into the Explicit Knowledge category in the Intellectual Capital profile of their authors or creators. This view represents a significant shift in the way we think about libraries and librarians. The intellectual capital of a library then is not its physical or digital collections, but the aggregation of the intellectual capital profiles of all of its staff and employees.

Because the primary value of a library in the knowledge society will shift from the library's resource collections to librarians' intellectual capital assets, libraries and library science education should consider the nature and level of intellectual capital investments. The intellectual growth of library professionals should be the primary focus. How libraries work and how they are managed should be aligned with the new knowledge economy. We cannot

Table 1
Examples of the Intellectual Capital Assets of Librarians

Types of intellectual capital assets	Library and information professional asset examples
Tacit Knowledge	Answers to questions, knowledge of sources, knowledge of subject domains, knowledge of information behaviors, knowledge of publishing industry, foresight
Skills	Analytical skills, coaching and mentoring skills, communication skills, critical thinking skills, facilitation and negotiation skills, high digital literacy skills, interviewing skills, knowledge creation, knowledge capture, knowledge preservation, knowledge sharing, knowledge elicitation, narrative intelligence, privacy practices, research skills, strong organizational skills, teaching and training experience, technical skills
Attitude	Adaptability, advocacy, attitude to universal access, coaching, continuous learning, creativity, collaborative attitude, eager to learn, emotional intelligence, engagement, knowledge sharing, mentoring, pro-literacy attitude, self-learning, self-motivation, self-reflection and review, service attitude, situational learning approach, social intelligence, visioning, willingness to work in teams
Explicit Knowledge	Collection development policies, collection guides, conference proceedings, formal educational credentials, frequently asked questions, information standards, presentations, professional publications, reading lists, webinars, workshops
Procedural Knowledge	Acquisitions and selection knowledge, budgeting knowledge, cataloging knowledge, circulation knowledge, facilities management knowledge, information finding strategies, knowledge of sources, literacy training knowledge, personnel management knowledge, program planning knowledge, reference service knowledge, search strategy formulation knowledge, storytelling knowledge, system design knowledge
Culture	Collaborative, community-oriented, fair rewards and recognitions, service orientation and attitude, learning culture, mentoring and coaching culture, open mindedness, open to different types of learning experiences, open to experimentation, strong community culture

Table 1 (*Continued*)

Types of intellectual capital assets	Library and information professional asset examples
Networks	Author networks, citations to other works, library science community, public sector community, publisher networks, religious community network, social networks, subject matter networks, voluntary sector
Reputation	Business relationships of the individuals, connections to civic organizations, connections to public sector agencies and departments, political connections and affiliations, professional association reputations of individuals, reputation for service, reputation in the subject domain, satisfaction rate with library service

simply assume that the way we as librarians and information professionals' work and what we do will continue along a predictable trajectory. Such an assumption significantly underestimates the magnitude of the shift that is transforming our external environment.

A key question arises. Are we preparing librarians and information professionals to play facilitation roles? Are the professional schools and continuous education providing opportunities to acquire or develop the intellectual capital assets that are needed for knowledge facilitation? What does this mean for professional competencies, codes of ethics, and most importantly, for library science education? A review of the professional standards and competencies published by a range of library associations reveals two primary types of intellectual capital and knowledge. The first type focuses on functional or core competencies. Functional competencies align with the procedural capital competencies referenced in Andriessen and Amidon's Intellectual Capital frameworks (Table 2). These are the competencies which allowed industrial era brick-and-mortar libraries to function. These are also the competencies taught in professional library science education programs.

The second type of competency (Table 3) includes professional and behavioral competencies what we have referred to in our Scenarios as Knowledge Facilitation methods. These competencies are valued and highlighted by professional associations. However, they are not generally taught in the library science education. They are learned on the job and gained through experience. These competencies map to the five of the types of intellectual capital identified by Andriessen and Amidon, including attitude, skills, tacit knowledge, network capital, and procedural capital.

Table 2
Functional Competencies of Library and Information Science Professionals

Cataloging	Materials circulation and access services	User services
Collection development	Outreach	Resource preservation
Collection maintenance	Planning and project management	Resource selection and acquisition
Collection management	Program development	Strategic management
Fiscal management	Promotion	Tacit knowledge of economic
Fundraising	Public relations	Legal and social issues
Instructional behaviors	Reference and referrals	
Learning theory and styles		

Table 3
Behavioral Competencies of Library and Information Science Professionals

Intellectual capital asset	New competencies for knowledge society
Skills	Creative thinking, knowledge architecture, knowledge capture, knowledge creation, knowledge preservation, narrative intelligence, social intelligence
Attitude	Adaptability, emotional intelligence, engagement, self-reflection, situational learning, visioning
Culture	Fair rewards and recognitions, open to experimentation, open and collaborative organizational culture
Reputation	Business relationships, connections to civic organizations, political connections and affiliations, reputation management
Networking	Author networks, public sector networks, religious networks, social networks, subject matter networks, voluntary sector networks

Finally, we observe that there are gaps in the competencies needed for the knowledge society and those currently addressed by either professional functional or behavioral competencies (Table 4).

In preparing for the knowledge society, there is an opportunity to reconsider which competencies we teach and how we learn these competencies. Let's consider why and how these competencies will be important for librarians in the knowledge society.

Table 4
Intellectual Capital Assets and Competencies Not Covered by Professional Associations

Intellectual capital asset	New competencies for knowledge society
Skills	Creative thinking, knowledge architecture, knowledge capture, knowledge creation, knowledge preservation, narrative intelligence, social intelligence
Attitude	Adaptability, emotional intelligence, engagement, self-reflection, situational learning, visioning
Culture	Fair rewards and recognitions, open to experimentation, open and collaborative organizational culture
Reputation	Business relationships, connections to civic organizations, political connections and affiliations, reputation management
Networking	Author networks, public sector networks, religious networks, social networks, subject matter networks, voluntary sector networks

III. Transformation to a Knowledge Society

In order to prepare for these transformations, we need to have a good understanding of the knowledge economy. There is a rich treatment of this topic in the economics literature (Asia Pacific, 2000; Atkinson & Andes, 2010; Barkley, Henry, & Li, 2004; Boydel, Hoggett, Rugkåsa, & Cummins, 2008; Carter, 1996; Chen & Dahlman, 2005; Dahlman & Chen, 2002; Daugeliene, 2004; Dutta & Mia, 2011; Gregory & Stuart, 2004; Hicks, Dattero, & Galup, 2006; Houghton & Sheehan, 2000; Leydesdorff, 2006; Lin, 2007; Lundvall & Johnson, 1994; Malhotra, 2003; Minton & Glasheen, 2010; Organisation for Economic Co-operative Development, 2002; Schwab, 2010; Smith, 2002; United Nations Economic Commission for Europe, 2002).

Science cities and "technopolies" reinforce the image of an advanced industrial society. Science cities were constructed to support people who are engaged in scientific or high technology projects, in specific timeframes, and to achieve specific outputs. These cities were largely created from scratch, with people imported to the communities (Anttiroiko, 2004; Benneworth, Hospers, & Timmerman, 2009; O'Mara, 2005). They targeted knowledge-rich professions or highly educated classes, and they were isolated from other cities. The essential structure and functioning of the science city was consistent with industrial economy, but because they imported scientists and

engineers into a new environment they lacked many of the essential elements of a well-rounded city, including heritage, culture, historic cityscapes and infrastructures, pride of place, multigenerational social systems, multicultural households, and an infrastructure in harmony with the environment.

Technopolies were targeted experiments in that they focused on incubators or hubs for invention, learning, and collaboration within existing cities (Castells, 1989, 2000; Castells & Hall, 1994; Chen & Choi, 2004; Haughton & Hunter, 2003). Like science cities, they targeted the same high skilled and highly educated segments of the population. And, like science cities, technopolies did not lead to the development of a knowledge city. Instead, they produced technology corridors or technology hubs which promoted economic growth for a particular economic sector and a subset of the larger population. However, technopolies more closely resemble our 21st century concept of a knowledge city than do science cities in that they were not isolated from the other traditional aspects of the city—business, cultural systems, social and civic systems.

Neither of these conceptualizations serves us well for understanding the future in which libraries as institutions or librarians as knowledge workers will function. It is because of these limited conceptualizations that the future vision of libraries has been short-sighted and unnecessarily constrained.

A. The Current Literature

How do librarians currently view their role in the knowledge society? The library science literature is rich with discussions of the future of libraries in the information society, in the digital age, and the knowledge society (Drotner, 2005; Faye, 2013; Khveshchanka & Mainka, 2011; Lankes, 2011; Lor & Britz, 2007; Lux, 2009; Mainka et al., 2013; Oppenheim & Smithson, 1999; Public Libraries of New Zealand, 2012; Robertson, 2000; Thorhauge, 2010; Wah & Choh, 2008; Zickuhr, Purcell, & Rainie, 2014). Five of these examples are discussed as representative of the overall focus of the discussion.

The Danish Agency for Libraries and Media (2010) references an information society and presumes that information transformation is at the base of knowledge creation.

> Society's value creation is to an increasing extent based on the citizen's ability to transform information into knowledge and to use this knowledge to create new value. … This means that access to information is important, and even though the Internet is a rich source of information, the citizen's access to the Internet is not sufficient to ensure a value-creating knowledge development. The libraries' physical and digital collections continue to be a vital knowledge base. (p. 6)

It indicates that "The citizen's possibility of creating new knowledge depends on the ability to find the relevant information and to use it efficiently" (p. 7). As the report suggests, codified and preserved information is important to a knowledge society. However, this statement represents a fundamental misunderstanding of knowledge and its source—people. It is not surprising that the future of libraries and the future of librarians would seem to be tied to the content that is collected and managed. This report fundamentally describes an advanced industrial economy of the early 21st century—with pervasive availability of digital content and media, free access, new media habits. In characterizing the knowledge society primarily from information and a technology perspective, the report's recommendations are limited to how to do what has always been done in a more technology-rich environment.

Public Libraries of New Zealand (2012) offer a strategic framework for public libraries in New Zealand for a near term future. Their report characterizes libraries as vibrant places of inspiration, debate, and social interaction. Like the other reports and frameworks, this report places heavy emphasis on information and material that is needed by all members of the community. Collections and services have to include all types of appropriate media and modern technologies as well as traditional materials.

Mainka et al. (2013) characterize the knowledge society as comprised of informational world cities. They characterize the role of libraries as falling into two main groups—digital library and physical library. The authors surveyed the core services of 31 specified Informational World Cities. The authors paint a picture of an information city as one in which flows of information, capital, and power are as or more important than physical spaces. The challenge with this characterization is that it defaults to a focus on technology and content. Information as contained in physical and digital content is the focus. While it is important to provide access to e-journals, e-books, e-newspapers, online catalogs, and databases as the chapter suggests, these are sources of encoded and static information, not sources of knowledge or intellectual capital. The chapter concludes with two recommendations: (1) libraries in a knowledge society provide all of their clients with digital services including e-resources, references services, communicate with their clients via social media; and (2) offer physical spaces for meeting, learning, and working. Because this work takes as a starting point the institution of libraries and their current form—like all the other reports and articles—it overlooks the library's greatest asset for a knowledge society—its information professionals.

Lor and Britz (2007) distinguish between information and a knowledge society. An information society in their view is primarily focused on ICT,

information processing, and distribution. They distinguish a knowledge society as focused on the creation, distribution, and use of content. We are again back to a focus on encoded information. While the authors acknowledge the role of human capacity and intellectual capital in the knowledge economy, it is in the context of education and not in the everyday exchange of ideas and knowledge, nor in the intellectual capital of library and information professionals. The authors do consider the future role of information intermediaries but from the perspective of whether the roles of librarians and information specialists will disappear. They postulate that the role will continue because there will always be a need to interpret and mediate information sources. Again, each of the roles that they identify—selection, acquisition, preservation, integrated access, dissemination, information literacy education, and user support—focus on content and information resources.

Lux (2009) is correct in her suggestion that the most important investment in a knowledge society is in knowledge and creativity. Lux further suggests that the most valuable assets are intellectual capital. While Lux emphasizes the importance of intellectual capital, she sees libraries as the providers of information for the creation of knowledge.

Libraries of the future will function in the knowledge society. Librarians' intellectual capital will be an investment in and accounted for in a knowledge economy. Knowledge economy, a knowledge society are abstract concepts. What might the use of these assets look like on a daily basis in a knowledge city?

IV. A Holistic Vision of Knowledge Cities

The field of future research tells us that trustworthy projections of the future take into consideration changes in all aspects of society (Cornish, 2004). For libraries, this means looking broader than technology projections. Bedford (2012) proposed a five-faceted model for a knowledge society (Fig. 1). According to this model, a knowledge society is comprised of an open and robust business environment, a societal regime which is infused with a knowledge-rich culture, knowledge-rich communications, strong interactions among society members, strong family and community units, a civic context which is characterized by rich citizen participation, knowledgeable public officials, knowledge-grounded laws and judicial bodies, open and free public discourse, civil liberties and the right to freely associate, a physical environment which supports well-being, health, safety and the resources which can sustain life, and a human development system

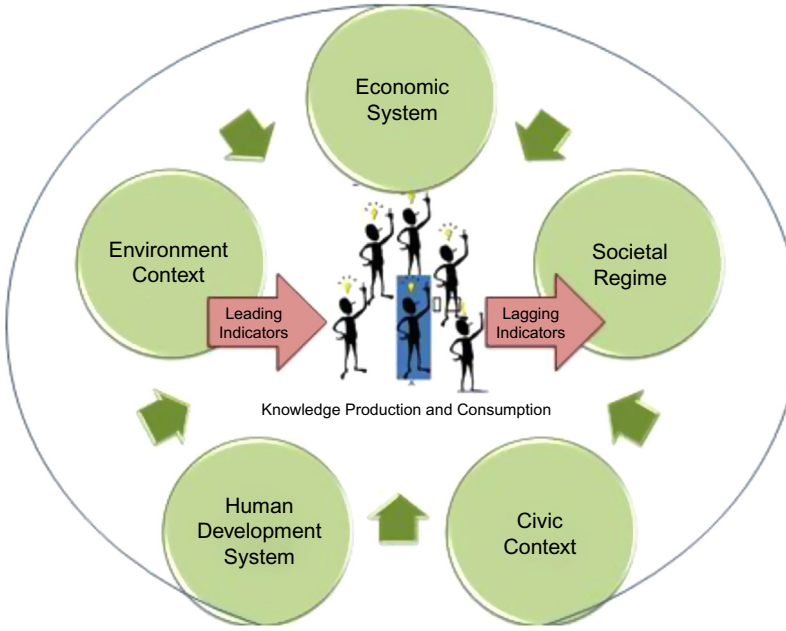

Fig. 1 Bedford's five facets of a knowledge society (Bedford, 2013b, p. 280).

which recognizes that people are now the primary engine of economic growth, of societal and political health, and which invests in the development of every individual in that society. The heart of the knowledge society, though, is knowledge production and consumption by individuals, communities, and organizations.

David and Foray (2002) and the International Wellbeing Group (2013) suggest that a knowledge society rests on a foundation of knowledge cities. A knowledge city is defined as a complex, adaptive, and dynamic system constructed around knowledge transactions. A knowledge city is one in which people are engaged in robust knowledge transactions. These transactions are the fuel that runs the knowledge economy. The focal point for a knowledge city is not its technologies, not its built environment, or high value businesses—rather the focus is the knowledge transactions that take place among people, households, community, and organizations (Benbya & Van Alstyne, 2010; Carrillo, 2011; Dvir, 2006; Garcia, 2006, 2007; Goldberg, Pasher, & Sagi, 2006; Krätke, 2011; Dvir, 2011; Cabrera, Collins, & Salgado, 2006). This characterization is very different from the characterizations of science cities and technopolies.

A 21st century knowledge city takes as a starting point an existing city. It is not an isolated area of a city or a city with a single purpose. A knowledge city is a complex, continuously adaptive, and chaotic system. The system revolves around knowledge transactions not only among the highly skilled or highly educated, but among all citizens. The focal point for a knowledge city is not its technologies, not its built environment, or high value businesses—rather the focus is the knowledge transactions that take place among people, households, community, and organizations. The 21st century knowledge city is really an expanded application of Dvir's image of a collage of interconnected knowledge moments and interactions (Dvir, 2006).

Paraphrasing Dvir a "knowledge moment" is a spontaneous or planned human experience in which knowledge is discovered, created, nourished, exchanged, and transformed into a new form. Dvir paints a picture of a knowledge city as a collage of knowledge moments. If you stopped to look at a week in your life, you could paint your own collage of knowledge moments. If you observed a knowledge city on a daily basis, you could paint a collage of the city's knowledge moments. In the knowledge city, knowledge citizens are an involved, evolved sort that values the capabilities of civic responsibility, tolerance, solidarity, self-motivation, and engagement (Goldberg et al., 2006). According to Winkler (2014) knowledge citizens value a knowledge-rich social context, civic regime, environment, business, and general human development. Such knowledge citizens want to live in a place where they work for and reap the benefits of an open and robust business environment, a societal regime infused with a knowledge-rich culture, knowledge-rich communications, strong interactions among society members, strong family and community units, a civic context characterized by rich citizen participation, knowledgeable public officials, knowledge-grounded laws and judicial bodies, open and free public discourse, civil liberties and the right to freely associate, a physical environment which supports the well-being, health, safety, and the resources which can sustain life, and a human development system which recognizes that people are now the primary engines of economic growth and societal and political health and invests in the development of every individual in that society.

A. Knowledge Facilitation and Knowledge Transactions

Knowledge does not circulate in any environment without deliberate attention. The intellectual capital assets we referenced in Table 1 take on value only when they are put into action or socialized (Brown & Duguid, 2002; Collins, 1998; Collins & Hitt, 2006; Faye, 2013; LaGanza, 2012;

Roth & Styhre, 2002; Tsoukas & Vladimirou, 2001). According to Tsoukas and Vladimirou (2001):

> Managing organizational knowledge does not narrowly imply efficiently managing hard bits of information but, more subtly, sustaining and strengthening social practices. In knowledge management digitalization cannot be substituted for socialization. … Knowledge management is primarily the dynamic process of turning an unreflective practice into a reflective one by elucidating the rules guiding the activities of the practice, by helping give a particular shape to collective understandings, and by facilitating the emergency of heuristic knowledge. (p. 991)

Knowledge cannot simply be applied. This is a critical point for libraries as it addresses the difference between knowledge as a resource and knowledge in action—transfers, exchanges, validation, invalidation, and so on (Choo, 1998; Dixon, 2000).

Making use of knowledge resources is a skill which will be highly valued in the knowledge society. Those who know how to do this are called knowledge facilitators. Knowledge facilitators help a group of people to create, interpret, articulate, express, and tell stories about knowledge in all of it forms. A key role in the knowledge city and central to knowledge transactions is facilitation. Knowledge facilitators bridge the "knowing-doing" gap (Pfeffer & Sutton, 1999). Their role, in a library of the future and in the knowledge society of the future, aims to orchestrate the distribution of knowledge (Alvesson, 2001; Alvesson & Kärreman, 2001; Garcia, 2006, 2007). The knowledge facilitator's role is to create arenas and opportunities for sharing knowledge. This is a new role in knowledge commerce and knowledge markets (Benbya & Van Alstyne, 2010). They

- engage in conversations
- facilitate dialog
- create trust
- do tacit knowledge elicitation
- energize and connect knowledge-creation initiatives and opportunities
- enhance knowledge creation and dissemination across organizational boundaries and communities.

Knowledge facilitators (aka future librarians) engage members of a community in an active process where they collectively reflect on their work and then share it with others. It is the premise of this chapter that librarians and information professionals are poised to play the role of knowledge facilitators in the knowledge city of the future. To play this role, though, a major shift in thinking is required. The shift in thinking must be equal to economic and social transformations.

B. Libraries as Knowledge Organizations

Now that we understand the critical role of knowledge facilitators, let's consider how this role might play out in the library of the future. With all of these economic and social transformations occurring in the external environments it is imperative that libraries begin to function like knowledge organizations. Industrial era organizations that operate under command-and-control methods will not succeed in the knowledge economy. How does a library transition from its current industrial-era management and engagement style to a knowledge organization? It begins by stepping back to consider its intellectual capital assets and shifting the way assets are managed. It means that librarians should behave like knowledge workers—engaging in and constructing communities of practice to do their work, taking every opportunity to collaborate with colleagues inside the library, across the library profession but more importantly with their stakeholders and the external community. It means that the management culture must shift from one of control, oversight, and cost management to one of engagement, shared values, openness, and focus on value. It means that value must be placed on the external engagement of librarians and information professionals in the knowledge society, not just in a nine to five job within the physical library. It means that librarians learn from real life experiences in the knowledge society, not just from absorbing information. In a nutshell, it means that the internal workings of a library need to be a reflection of the external society. Librarians first and foremost must become knowledge facilitators within the institution.

Four future scenarios are offered here to demonstrate how future libraries might better leverage library and information professionals' intellectual capital and their knowledge facilitation competencies. Each of these scenarios also represents a fundamental shift in the organizational culture of libraries. Each scenario suggests a change in our fundamental beliefs of who has the knowledge that is critical to the challenge at hand, how that knowledge is valued, and how it might be leveraged.

1. Future Scenario 1.1: Reference Exchange

In a knowledge city, citizens expect to be able to go to the future library with problems that need to be solved, not just questions that need to be answered. Requests will not be limited to requests for information because most citizens will be able to answer many of those questions directly. Responding to these requests means that librarians will have to bring in a team of subject matter experts to address the question. In this scenario, the library has constructed a knowledge network around several important subject domains. These experts

Table 5
Future Scenario 1.1: Knowledge Facilitation Factors

What is the relevant traditional library function?	Reference and referral services
Who are the stakeholders?	Business community, economic sectors, subject matter experts, library community
What is the expected outcome?	Solution to a problem posed by the community
What facilitation methods are needed?	Problem solving, networking, reputation management, collaboration, communities of practice

can be contacted to engage in time-sensitive problem solving or to answer expert level questions. The network was designed using network analysis methods, but was built out using the library's relational capital—meaning connecting and engaging with individuals. The library's network is cultivated and managed with equal or greater respect and effort than are devoted to physical collections or resources. The knowledge facilitation methods that are inherent to this scenario are described in Table 5.

2. Future Scenario 1.2: Technical Services Exchange

The library has a very active young adult community. Acquisition/catalog librarians maintain strong contacts within the library community to keep abreast of what new materials may be of interest to young adults. These librarians also maintain strong direct connections with the young adult community through a social network that allows them to understand young adult interests, what's coming down the pipeline, and what young people are thinking about new materials. In addition to having direct input for selection, such librarians also understand how their target audience talk, think, and how they look for resources. She's received a new graphic novel and she's adding it to the digital collection. She dutifully adds the Library of Congress Subject Headings, but she also adds access points for terms that her stakeholders will use. Her access points reflect the way that young people think about these kinds of resources. As a result of her networking, the young adults in the knowledge city are gaining an understanding of how to manage resources, and how to make them accessible. They're also gaining respect for the work that she does on their behalf. They will absorb this knowledge and it will become part of the way that they work. In addition, the relationship provides reverse mentoring for the acquisition/catalog

Table 6
Future Scenario 1.2

Issue	Knowledge facilitation factors
What is the relevant traditional library function?	Selection and acquisitions, cataloging
Who are the stakeholders?	Young adult community
What is the expected outcome?	Increased access to resources, growth of literacy skills, increased knowledge of information management practices, increased knowledge of social media and digital resources
What facilitation methods are needed?	Networking, communication, community of practice, trust building, knowledge sharing, mentoring and reverse mentoring, relational capital building, learning

librarian as she learns more about how they use social media and interact with digital resources. Table 6 highlights the knowledge facilitation skills that are implicit to this scenario.

3. Future Scenario 1.3: Program Planning

In this scenario, the community library is setting up a series of children's program. The series is intended not just to entertain but to begin to build strong knowledge competencies among children so that they can begin to prepare for primary school. The children's librarian assembles a community of practice that includes parents, teachers, local authors, professional and amateur storytellers, day care providers, and talent management specialists. While designed for very young children, the programs are designed around the basic competencies that allow individuals to succeed in the knowledge society. The community of practice identifies a set of competencies that are important to succeeding in the knowledge economy—knowledge valuation, knowledge sharing, team work and collaboration, communication, problem solving, and so forth. The teachers and librarians come up with a program curriculum. Storytellers, parents, and day care providers suggest activities. Librarians pull the program together and design an implementation strategy that engages all of the stakeholders. In addition, talent management experts suggest sources of funding to support program development and delivery. The program is shared with other libraries across the region and the country. Feedback and additional suggestions from outside the

Table 7
Future Scenario 1.3

Issue	Knowledge facilitation factors
Librarian's background	Children's librarianship, program development, instructional design, literacy training
Who are the stakeholders?	Children, parents, teachers, business community, public sector organizations
What is the expected outcome?	Short-term outcomes include increased literacy and knowledge competencies among children. Long-term outcomes include more successful knowledge citizens and more successful public and private sector organizations
What facilitation methods are needed?	Communities of practice, organizational learning, knowledge sharing, knowledge creation, collaboration, communication, trust building

community enrich the program as it is delivered in future years. Knowledge facilitation is happening on multiple levels in this scenario—among children who participate in the program, among the community members involved in designing and funding it, and over time across cities and regions as the program is shared with other libraries as shown in Table 7.

4. Future Scenario 1.4: Community Collection Building

Consider this scenario in the context of a knowledge environment. The community which the library supports has been hard hit by an economic downturn. The manufacturing industries which used to support the community have left the region. The tax base that used to provide a strong financial tax base for the community is no longer available. The community needs to continue to provide access to collections though, to support the basic and advanced literacy, education, and recreational needs of its citizens. The library director has assembled a community of practice of library professionals, citizens, and interested technology vendors to construct a community-based, community-owned, and governed digital library. The community library leverages resources that are owned by citizens or contributed through the Friends of the Library. The community library thus is a robust example of resource sharing and trust building across the community. Table 8 highlights the knowledge facilitation competencies that underpin this scenario.

Table 8
Future Scenario 1.4

Issue	Knowledge facilitation factors
What is the relevant traditional library function?	Collection development, collection management, resource circulation, catalog management and maintenance, metadata creation
Who are the stakeholders?	Entire community, entire library staff, technology vendors, local and extended technology business community
What is the expected outcome?	Continued and expanded library collection for community
What facilitation methods are needed?	Networking, trust building, knowledge sharing, fundraising, governance

C. Librarians as Knowledge Citizens in the Knowledge City

In the knowledge city of the future librarians and information professionals have new opportunities to play the role of knowledge facilitator. This means creating opportunities to play that role anytime, anywhere, and with any knowledge citizens. It does not mean waiting for, or expecting knowledge citizens to come to us with requests. The knowledge facilitator is proactive and engaging. This means recruiting into the profession, and rewarding those individuals who look proactively for opportunities to engage. It means changing our organizational culture from one which protects and values collection resources to one which values intellectual capital and the ability to contribute to a knowledge society. Opportunities to engage are not seen as additional drains on our resources but as opportunities to demonstrate professional competencies, and opportunities to contribute to the transformation to a knowledge economy. Taking advantage of external opportunities means rethinking how resources are allocated to the internal workings of the library of the future. It means maybe having to share those responsibilities with other stakeholders in order to achieve a greater good. The greater good in this case is leveraging the intellectual capital of professionals to teach others and to facilitate knowledge transfer.

In the following section, we offer six scenarios to illustrate what engagement might look like outside of the traditional library context. Each scenario highlights the knowledge facilitation competencies librarians will need to function in a knowledge society.

1. Future Scenario 2.1: Advising the City Council on Broadband Contract Design

The knowledge city realizes the importance of having affordable and universal cloudband access for all of its citizens, all of its organizations, and the business community. In this scenario, good affordable communication architecture is the backbone of any intelligent city. The City Council is embarking on a multiyear project to wire the city and ensure that the design they adopt will serve all of the citizens well, and will be sustainable and extensible for the foreseeable future. The City Council, being an enlightened group of knowledge citizens, realizes that the resident expert is their colleague—the Director of the Library/Knowledge Sciences Center. From their previous work with the Director, they understand the deep knowledge such a person has on types of content, future trends on access, price points for information among various communities in the city, and his strong background in the economics of knowledge and information. They also know that the Director is the resident expert on information and knowledge policies. And, that she has a network of contacts within the broadband industry. The City Council decides to add the Library Director to their project team. He in turn, brings in some of his internal staff to support the project. Table 9 highlights the knowledge facilities competencies that support this scenario.

2. Future Scenario 2.2: State Prison Environment

In the knowledge economy, a knowledge city cannot afford to waste any of its intellectual capital assets. Like all other cities, this city has an incarcerated

Table 9
Future Scenario 2.1

Issue	Knowledge facilitation factors
What is the relevant traditional library function?	Information access, information policy, economics of information, contract administration, systems design, technology management
Who are the stakeholders?	City council, entire knowledge city, technology vendors
What is the expected outcome?	An optimal contract design for broadband network
What facilitation methods are needed?	Negotiation, relational capital, reputation management, organizational culture, service attitude

population. The intent is to ensure that to the extent possible, incarcerated individuals have opportunities to grow their intellectual capital competencies to be productive knowledge citizens. The priest of one the local Catholic parishes has established a prison ministry. As part of his ministry he arranges to provide copies of paperbacks for prisoners to read. The church's limited budget does not allow him to provide digital access to materials. This provides both an opportunity to build their literacy skills and to use their recreational time in a constructive manner. The challenge is that the priest has very limited resources. He works with donated materials and what he can afford to purchase out of his limited funds. Because the number of books is limited, but the demand is high, the prisoners end up cutting the books up into chapters so that several of them can be reading a book at the same time. The priest serves on the local library advisory board so he is well aware of some of the innovative things the library is doing with resources. Among the priest's parishioners is the knowledge architect for the local library. One day after services, he approaches her for advice on how to more effectively meet this new demand. He sees the demand growing in the future. The knowledge architect studies the problem and comes back to the priest with a proposal to take to the company that manages the prison and some library vendors. The proposal describes a new architecture that makes digital versions accessible to prisoners on a secure network within the prison. In order to further grow the digital literacy skills of the inmates, the priest and the knowledge architect create a community of practice of prisoners, library systems developers, prison managers, and publishers to help design the interface and structure. The results? The publishers gain a secure environment in which to provide content. The publishers get a reputation-boost for corporate social responsibility contributions. The library has developed a working partnership with the outreach ministry and is now actively engaged in increasing digital literacies within the prison. Table 10 highlights the knowledge facilitation competencies that support this scenario.

3. Future Scenario 2.3: Crowd-Sourced Collection Development

Because this future library is heavily engaged in knowledge-related activities throughout the city, there is need to think differently about how they accomplish this with traditional library funds. An important traditional function is collection development. This is generally a time-consuming activity which requires high levels of intellectual capital—knowledge of a domain, time to review sources, make selections, acquire materials, and monitor the collection for general health and relevance. The future library has decided to teach its citizens how to do collection development in an

Table 10
Future Scenario 2.2

Issue	Knowledge facilitation factors
What is the relevant traditional library function?	Content architecture, metadata architecture, collection management, reader services
Who are the stakeholders?	Incarcerated population, religious community, prison management company, publishers
What is the expected outcome?	Short-term—increased digital literacy skills, improved quality of recreational time. Long-term—good living models, productive knowledge citizens
What facilitation methods are needed?	Creative thinking, problem solving, design, networks, reputation, trust building, systems design, knowledge architecture

open community, using crowdsourcing methods and social media. Working within the overall collection policy framework and strategy, the library has offered its citizens the option to engage in collection development and management. This is particularly important for areas of the collection which deal with unique local resources. As it happens, our Knowledge City was the site of a major political event in the late 1800s that led to the creation of new labor protection laws. While there is some local history and markers, the city is in danger of losing local stories and memory. The library has created a collection area in its policy that enabled the community to build out the collection and design a framework for sustaining it. The knowledge facilitation skills supporting this scenario are highlighted in Table 11.

4. Future Scenario 2.4: Community Seed Library

This scenario focuses on a library in an urban area of a state that is otherwise largely agricultural. The state has a rich history of developing plant varieties which are well adapted to the environment. There is a rich heirloom seed tradition where farmers and agriculturalists have traditionally grown gardens from saved and exchanged seeds. The local 4-H Clubs in the surrounding rural areas have an interest in advancing an urban agriculture agenda in the city. There are large tracts of land in the city which are unused and are in danger of becoming dumping grounds for waste. The land could be made available for community gardens and establishing a system of urban agriculture to help provide better nutrition for the local residents. 4-H

Table 11
Future Scenario 2.3

Issue	Knowledge facilitation factors
What is the relevant traditional library function?	Collection development, collection management, preservation, storytelling, knowledge architecture, intellectual property
Who are the stakeholders?	Entire knowledge city, national history community, teachers, digital tourists
What is the expected outcome?	Knowledge transfer of collection development and management practices from librarians to citizens, preserved resources, accessible resources, expanded knowledge of historical events, enhanced learning design through personal stories
What facilitation methods are needed?	Communities of practice, systems Design, use of social media, communication, collaboration, networking, trust building

Club members approach an access services librarian to learn how to establish a borrowing and lending collection of seeds. The access services librarian works with the Club members to find old unused library catalog cabinets to house the seeds. The access services librarian brings in the staff that supports the outreach librarian to better understand how to reach into the urban neighborhoods for which this project would be most valuable. The 4-H Club members develop an urban agriculture training program working with a group from the neighborhood. The library adopts the program as one of its digital resources. The program gains recognition from local farmers who contribute heirloom seeds, and volunteer to coach the young urban farmers. The seed library develops extensive metadata records for all of its seeds and becomes a major source of information about local varieties. Local garden shops and landscapers begin to donate seeds and seedlings to the effort. This scenario highlights additional knowledge facilitation competencies librarians will cultivate in the knowledge society (Table 12).

5. Future Scenario 2.5: Rural Community Knowledge Elicitation

This library of the future is a one person library in a resource poor but knowledge-rich remote community. The community has a rich tradition of environmental protection and one family who has been the steward of an

Table 12
Future Scenario 2.4

Issue	Knowledge facilitation factors
What is the relevant traditional library function?	Access services, community outreach, metadata creation, collection management, instruction
Who are the stakeholders?	City neighborhood residents, farmers in surrounding areas, botanists, local young farmers
What is the expected outcome?	Short-term is environmental protection of abandoned land, and increased knowledge of agriculture among a new generation. Long-term outcome is healthy citizens, reclaimed land, preserved plant varieties, and an improved dialog across rural and urban populations
What facilitation methods are needed?	Implicit knowledge exchange, knowledge elicitation, problem solving, communication, community of practice, networking

important habitat for unique species. The younger generations of this family have moved to the city and will not continue the stewardship role. The community realizes that it is facing a crisis of knowledge capture and transfer. There is only one member of the family still alive and living on the property. The local Sierra Club approaches the Library Director for advice on leveraging the library's intellectual capital to capture and record the knowledge of this individual. This remote library is a knowledge outpost in the larger knowledge sciences network whose hub is in the nearby city. The librarian reaches out to her network and finds a member of a knowledge elicitation guild. The guild arranges to train a local student in the remote community. There is a trusting relationship between the custodian and the students—the student works with the last family member over a period of a year to elicit and capture the knowledge so that it can be shared with others in the community. The direct transfer to others in the community ensures that the knowledge will be put to use throughout the area. Without these connections and without the library director's network, this knowledge would have been lost. A local student how has a new knowledge elicitation skill that can now be leveraged to advance his career. The library recognizes a new service that can be offered to businesses—capture of tacit knowledge for those employees who are scheduled to retire. Human capital and structural capital assets are important to this scenario (Table 13).

Each of these scenarios has demonstrated the library's involvement in the activities of a knowledge city. This involvement is grounded in citizen

Table 13
Future Scenario 2.5

Issue	Knowledge facilitation factors
Who are the stakeholders?	Environmentalists, Sierra Club, rural community, young information professionals
What is the expected outcome?	Continued stewardship of the unique habitat, protection of the endangered plant and animal species, career development for students, increased recognition of tacit knowledge in library
What is the relevant traditional library function?	Oral history, special collections, program development
What facilitation methods are needed?	Knowledge elicitation, communication, knowledge capture, knowledge preservation, interviewing skills, interpersonal skills, active listening

recognition of the critical knowledge facilitation role of librarians and information professionals. Daily engagement enables citizens to learn knowledge and information management competencies. Organizations learn how to acquire and adapt information management capabilities that will improve the way they work. The quality of knowledge moments and transactions that were discussed earlier increase because library and information professionals are engaged. Knowledge facilitation is alive and well in each of those engagements. Citizens of the city learn from working with librarians. The end game is that the knowledge city's knowledge moments have been enriched by the knowledge facilitation of librarians and information professionals. To ensure that librarians and information professionals are prepared to step into this role, we must ensure that these competencies are addressed in professional education and that it is valued by the libraries of the future.

6. Future Scenario 2.6: Knowledge Transfers among Rural Academic Libraries

In the future we will still have colleges and universities and they will still have traditional libraries because access to scholarly resources is important to everyone in higher education, regardless of size or location. While this scenario characterizes them as being rural, it also assumes that one is a small college with only 700 students and 70 total faculty members. Traditionally, these libraries and institutions have been resource disadvantaged due to

shortage of critical financial resources to invest in the high priced services. Their libraries have not had sufficient budgets to hire credentialed information professionals. In the knowledge future though, small and rural academic libraries can use their knowledge and their relational capital (e.g., networks) to assemble virtual collections, to barter knowledge for essential services, and to promote local knowledge to other communities. In this scenario, the librarians and information professionals leverage their traditional state supported networks, but they also create peer-to-peer networks with individuals around the country. A small and rural library network serves as an ad hoc professional association for these communities. The networks provide learning opportunities, problem solving sessions, and support structures for what are often single-person libraries and businesses. The challenges and practices of these small institutions are often unique and perfectly suited to communities of practice. It is also important to remember that a small college in a rural area is likely to serve as a knowledge hub for the external rural community. This scenario leverages librarians' human and relational capital assets (Table 14).

V. Observations

The research team offers seven observations based on our experience, our conversations, and our professional perspectives.

Table 14
Future Scenario 2.6

Issue	Knowledge facilitation factors
Who are the stakeholders?	College and university faculty and students, information professionals, broader external community
What is the expected outcome?	Provision of any and all requested knowledge and information products and services with minimal financial resources
What is the relevant traditional library function?	All functions, including professional information education
What facilitation methods are needed?	Community of practices, networking, creativity, problem solving, communication, cooperation, empathy, public service attitude, knowledge sharing, lifelong learning attitude, ability to interpret and create policy for unique environments

A. Observation 1: Shift in the Core Curriculum for Information Professionals

There is a strong mapping between the behavioral competencies described by professional associations and the knowledge facilitation methods references across all 10 scenarios. The challenge, though, is that these competencies are not generally taught in professional schools. Rather they are learned on the job or in real life experiences. The challenge for us in academia is to design curricula, and to develop courses and assignments that enable students to develop these behavioral competencies as part of their formal education. Other human capital and relational capital assets should be adopted and promoted by professional associations.

B. Observation 2: Adoption of Systems Thinking as a Core Competency

An essential addition to the core curriculum of library and information science education—not an elective, but a core course—is a course in Systems Thinking. Librarians and information professionals must be trained to think of the "system" of knowledge and information, and their role as facilitators and mobilizers in that system. Information resources should include relational capital, community building, and collaborations with outside experts. This approach goes beyond the individuals' knowledge and taps into the tacit knowledge of those outside the library. The knowledge society places a high value on collective knowledge and wisdom, encouraging librarians to engage with the larger community, and encouraging others to participate in library work.

C. Observation 3: Nontraditional Sources of Learning for Professionals

The master's degree is considered the terminal professional degree for librarians. In a knowledge society, though, there is no end to learning—it is continuous. Librarians and information professionals should create and look to other sources of learning—such as open online courses, MOOCs, continuing education webinars, and so forth. Librarians should create and publish these, and not just expect the professional societies to develop them. In a knowledge economy, others will be performing knowledge facilitation and information management functions. It is time to think about sharing our professional knowledge to add value to the work of others. Traditional library work is now done well beyond the virtual or physical walls of a library.

D. Observation 4: Valuing Knowledge of Local Communities and Cultures

Knowledge of local community activities and culture is as essential to succeeding in the knowledge society as is a professional credential. Over time, knowledge citizens might become as knowledgeable about information and knowledge resources as traditional librarians. The comparative advantage we are left with is knowledge facilitation of resources and the local community.

E. Observation 5: Shift in Management Culture

Those responsible for managing libraries in the future must find ways to shift the organizational culture from industrial era command and control to a forward-looking knowledge- and intellectual capital growth culture. The culture needs to shift from one that focuses on costs and cost cutting, to one of value creation and opportunity creation. Managing in the future means creating an environment where people can grow and leverage intellectual capital. In order to affect this shift, we suggest the profession to look beyond the traditional business administration training to the knowledge sciences.

F. Observation 6: Looking Beyond the Library Walls

Libraries must see their future in terms of the broader changes taking place in society, and not in terms of technological developments and trends. Librarians need to believe that they have a role in inventing the future, not just reacting to it. We need to shift our image from a profession focused on the safeguarding of collections, to a profession of knowledge facilitators.

G. Observation 7: Valuing and Promoting Progressive Professionals

It is important to note that many of the scenarios we have shared are drawn from real life. There are librarians and information professionals who are creating opportunities and engaging in knowledge solutions today. However, the opportunities are neither recognized nor highly valued by the profession. Too often they are seen as unnecessary distractions for our "real work." Knowledge transactions and knowledge moments require proactive knowledge facilitation. Librarians and information professionals are poised to step into this role.

VI. Conclusions

The knowledge society and economy will bring transformations that change how libraries work and what they do. The most important change, though, will be the increased value of librarians' intellectual capital assets. Visions of the knowledge society which focus only on digitization and the digital delivery of current services miss the fundamental change. Librarians should prepare for new roles in the knowledge society, not just by increasing their information technology skills but by investing in and growing their intellectual capital assets. Library science professional competencies should be expanded. Library science education should include knowledge management and intellectual capital competencies. Behavioral competencies should be elevated to the same status as functional competencies. A fundamental change in attitude toward our own intellectual capital is a first step. Librarians must see themselves not just as stewards of information resources, but as active and critical agents in the knowledge society.

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Open Peer Review: Fast Forward for a New Science

Samir Hachani
Department of Library and Documentary Sciences, Faculty of Social and Human Sciences, Algiers' University 2, Algeria

Abstract

Peer review has been with humans for a long time. Its effective inception dates back to World War II resulting information overload, which imposed a quantitative and qualitative screening of publications. Peer review was beset by a number of accusations and critics largely from the biases and subjective aspects of the process including the secrecy in which the processes became standard. Advent of the Internet in the early 1990s provided a manner to open peer review up to make it more transparent, less iniquitous, and more objective. This chapter investigates whether this openness led to a more objective manner of judging scientific publications. Three sites are examined: Electronic Transactions on Artificial Intelligence (ETAI), Atmospheric Chemistry and Physics (ACP), and Faculty of 1000 (F1000). These sites practice open peer review wherein reviewers and authors and their reviews and rebuttals are available for all to see. The chapter examines the different steps taken to allow reviewers and authors to interact and how this allows for the entire community to participate. This new prepublication reviewing of papers has to some extent, alleviated the biases that were previously preponderant and, furthermore, seems to give positive results and feedback. Although recent, experiences seem to have elicited scientists' acceptance because openness allows for a more objective and fair judgment of research and scholarship. Yet, it will undoubtedly lead to new questions which are examined in this chapter.

Keywords: Peer review; traditional review biases; Faculty of 1000; Electronic Transactions on Artificial Intelligence; Atmospheric and Chemistry Proceedings

I. Introduction

Peer review has been with us as long as human beings have tried to communicate. We all try to get approval from others just by talking, moving, and undertaking actions. If this kind of approval is done unconsciously on a daily basis, science on the other hand seeks such approval explicitly by

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relying heavily on peer review to advance on a solid and agreed upon basis. Scientists or researchers advance and are promoted on the basis of their work according to their papers, chapters, books, inventions, and research. It is like an intellectual competition in which only the brightest who present the most valuable works are rewarded. This is why editors, key players in the journal publication process, and referees have been called "the linchpin about which the whole business of Science is pivoted" (Ziman, 1968, p. 111) or "Gatekeepers of science" (Crane, 1967, p. 195). All of this shows the importance and ineluctability of peer review in the conduct of science. Consequently, and also as a result of it, peer review has been subjected to a wide and quarrelsome body of literature, most of it criticizing its implementation. Among the numerous issues mentioned are inadequacy of reviews, slowness of the process, rejection of innovative results, generally conservative biases, and the secrecy in which reviews have been conducted in a paper-oriented and pre-networked world.

When one says secrecy, one thinks automatically about impunity and cronyism. One thinks also about a possible old boy network exchanging favors to advance each other's agendas. All this has changed with the advent of the networks, mainly the Internet, allowing for increased openness and less manipulation. Peer review, as a result, is performed practically live on the Internet by whole communities of researchers and not by chosen referees. Has this new way of undertaking peer review changed the way it is conducted? Has it made it more equitable, just, and more fair? Does this openness allowed by the Internet consist only of advantages? This open process is quite recent and still in experimental stages, with only a few sites and domains having undertaken it. Among these, Electronic Transactions on Artificial Intelligence (ETAI), Atmospheric Chemistry and Physics (ACP), and Faculty of 1000 (F1000), have been highly active in promoting complete openness of the process. This chapter presents these three sites as prototypes of what peer review could be like in the future and which, in fact, have begun in some domains and areas of research.

II. Peer Review: A Brief History

The inception date of peer review as we know it today, is difficult to establish although *The Philosophical Transactions*, considered to be the first scientific journal, explicitly speaks of peer review in an excerpt of the minutes of March 1, 1665 stating "*The Philosophical Transactions* to be composed by Mr. Oldenburg … being first *reviewed* (emphasis added) by some of the members of the same" (Beaudry, 2011, p. 129).

The Royal Society of London is frequently assigned credit for having introduced the concept of refereeing or reviewing scientific manuscripts for publication in 1752. At that time, the Society finally, after almost 100 years of its existence, took over fiscal responsibility for *The Philosophical Transactions*. It established what they called a Committee on Papers, whose function it was to review all articles that were published in *The Transactions*. The new regulation stipulated that five members of the committee would constitute a quorum. It also provided that the committee could call on "any other members of the Society who are knowing and well skilled in that particular branch of Science that shall happen to be the subject matter of any paper which shall be then to come under their deliberations" (Kronick, 1990, p. 1321).

Along the same lines, Kronick, an expert on the subject of the first scientific journals of the 17 and 18th centuries, wrote:

> Some current editorial practices, such as peer review, began, in the methods these early societies devised for accepting communications for publication. Booth argues that the Royal Society of London first "introduced the concept of refereeing" in the middle of the 18th century by setting up a committee to review all papers before they were published in the Philosophical Transactions. There were, however, many antecedents to this practice. Oldenburg (the first editor of *Philosophical Transactions*) screened communications for presentation to the Society, but after the papers were read, they were "ordered to be reviewed by several of the Fellows." The Académie des Sciences in Paris, early in its history, established select committees to determine whether a member could or could not publish under its auspices. The peer review process almost as we know it today is described in the preface to the French edition of the Medical essays and observations published by a Society in Edinburgh in 1731. Papers submitted, it informs us, are distributed according to their subject content to those members of the society who are more versed in these matters for their review. It also specifies that the identity of the reviewer is not made known to the author, an early example of the controversial anonymous reviewer. The Société Royale de Medicine, soon after its institution in 1776, inaugurated a system by which two members examined each paper submitted to the society and provided the other members with a summary and critique. Validation of scientific work through review and discussion was in fact a major function of early scientific societies. (1984, pp. 869–870)

This imprecise and somehow contradictory dating becomes even more imprecise if one considers Spier's (2002) quotation of a doctor going through some sort of local group of physicians reviewing his practice. The process is described in the following way:

> This work, and its later variants or manuals, requires that it is the duty of the visiting physician to make notes of the condition of the patient (in duplicate with one copy staying with the patient) on the occasion of each encounter. When the patient had been cured or had died, the notes of the physician would be examined by a local council of physicians who would adjudicate as to whether the physician had performed according

> to the standards that then prevailed. On the basis of their rulings, the practicing physician may or may not have been sued for damages by a maltreated patient. (pp. 1−2)

The reason Kronick (1990) and Spier (2002) date the inception of peer review so differently is that while they describe the same process it is applied to different settings. When Spier cites the *Ethics of the Physician*, he speaks of how peers judge one of their own in the practice of medicine. On the other hand, Kronick speaks specifically about publication of papers and research in scientific journals. It is this kind of refereeing and reviewing that modern research has undertaken and studied. Moreover, it judges the value, acceptability, and scientific rigor of a particular research which is the point of the following discussion.

If peer review is now the standard venue for judging science and its research as a screen, both quantitatively and qualitatively, to select the best to publish, this was not the case in the beginning when the differences between books and journals were not as clearly distinguishable as they are today. This confusion resulted from the newness of the medium as well as its progression and slowness to replace books. According to Bazerman (1988) "The appearance of the scientific journal in 1645 [*sic*] did not immediately displace books as the primary means of communicating scientific findings. Books remained the more substantial source for scientific information for many years, interacting with the emerging journals" (p. 80).

On the same subject, Meadows (1974) states that "major research continued to be written up in monograph form throughout the eighteenth century, but the habit began to die out in the nineteenth century, at least among the physical sciences" (p. 67). This is quite consistent with Kuhn (1962) who details the way scientific revolutions are undertaken as going through three paraphrased phases:

- The pre-paradigm phase in which there is no consensus on any particular theory, but is characterized by several incompatible and incomplete theories;
- The normal science phase when a group agrees on a particular set of ideas and a framework of thoughts leading to a consensus; and
- The revolutionary science phase when the underlying assumptions of the field are reexamined and a new paradigm is established.

The scientific journal went through these phases when the previous revolutions (printing being the foremost) became obsolete. The printed book, which represented an extraordinary advance compared to manuscripts, soon became outdated when journals appeared and gradually superseded books in their speed of publication.

Although peer review acts nowadays as a quantitative and qualitative sieve to publish the best of research, this was not always the case. At the

beginning, the scientific journal was not as important as it has become nowadays. Its newness, the book's contention, the lack of research material, the weak educational levels of the time, made editors, or whatever was their function then, look for material to fill up their journals. As Spier (2002) explains it,

> One should notice though that peer review was not as important or even implemented with the first steps of the scientific periodical in mid-17th century. That period saw the journal space outstrip, and by far, the number of submissions … From the mid-1800s, there was more journal space than articles to print. When journals set up a board of assistant editors, their primary responsibility was to elicit articles and reviews to fill the pages of the publication. Peer review for the next 100 years consisted of the editor's opinion fortified when necessary by special committees, set up by societies to assess incoming manuscripts. (p. 3)

One could say that peer review as we know it today has not had a linear implementation and was a process that was rather made on a case by case basis. The first journals implemented it, but not uniformly nor across the board. They just carried it out whenever they could. If its implementation became unanimously accepted much later, the reason was the extraordinary explosion of information observed after World War II.

III. Information Overload: A Prerequisite of Modern Peer Review

If this is not peer review as we know it today, it represents at least an embryo of what would become a sine qua none condition of published scientific research. The reason for its launch and unanimous implementation was the exponential and tremendous research effort undertaken by the United States and Europe to rebuild what the war destroyed.

Price (1963) documented the issue in a seminal, and now a classic book, in as early as 1960s. Among the most striking statistics, he found that between 80% and 90% of the scientists having lived were still alive in 1963, that the gross size of science, be it in workforce or publication, doubled every 10–15 years, that the numbers of scientific journal was around 50,000 of which 30,000 are still publishing some 6,000,000 articles increasing by some 500,000 articles per year. His last interesting statistic, calculated that at that time was that there were around 1,000,000 scientists in the United States, a figure that increased in the following manner: there were 1000 in 1800 and again in 1850, 100,000 in 1900 which reached a million in the 1960s. These figures are compounded and confirmed in the United States' President's science report (The President's Science Advisory

Committee, 1963). In this report, the Committee details the way that the scientific community sought to deal with the issue. For example, it found that *Chemical Abstracts* held 54,000 abstracts in 1930, which rose to 165,000 in 1962. It estimated that by 1970 it would reach 200,000 abstracts. Another source estimated that the four biggest bibliographical databases—*Chemical Abstracts, Biological Abstracts, Excerpta Medica* and *MEDLARS*—would exceed 200,000 abstracts (Loosjes, 1973). In a similar vein, the number of abstracts and journals was estimated in 1963 at respectively 1,000,000 and 100,000 (Shilling, 1963). Finally, another estimate put the number of journals in science and technology at 41,000 and at 1,000,000 the number of articles. All the other disciplines would add up to 1,000,000 articles (Bourne, 1962).

This *Operation Deluge* as described by the Navy's Librarian in the 1950s (Loosjes, 1973) hastened the implementation of a way to manage it. Beside the different programs all geared at managing this information overload, peer review was, and remains a rather qualitative type of selection. It selects the best, or at least classifies and ranks submissions, to be published avoiding a glut that was not, and still is not manageable.

IV. Modern Peer Review

As it was difficult to determine exactly the beginning of the implementation and launch of peer review in its first forms, similarly it is difficult to determine a precise date of its implementation in its modern and emerging form. Generally, modern peer review began when editors began sending manuscripts to external referees. Most of the refereeing in the 19th and early years of 20th century was done internally and by the members of editorial boards, if not by the editors themselves. This was possible because the quantity of research to be reviewed was still relatively manageable and the extreme specialization that characterizes science nowadays had not yet set in. Weller (2001), in a comprehensive and retrospective narration of peer review, dates the first occurrence of modern peer review to 1942 when *The Journal of Clinical Investigation* began using editorial peer review "and the editor, Gamble, instituted the policy of sending papers to experts outside the editorial board for evaluation" (p. 4). Burnham (1990) reinforces this saying:

> Practically no historical accounts of the evolution of peer review exist. Biomedical journals appeared in the 19th century as personal organs, following the model of more general journalism … . The practice of editorial peer reviewing did not become general until sometime after World War II … Editorial peer review procedures did not spread in

> an orderly way; they were not developed from editorial boards and passed on from journal to journal. Instead, casual referring out of articles on an individual basis may have occurred at any time, beginning in the early to mid-19th century. Institutionalization of the process, however, took place mostly in the 20th century, either to handle new problems in the numbers of articles submitted or to meet the demands for expert authority and objectivity in an increasingly specialized world. (p. 1323)

This is a clear indication that peer review is new in implementation in both quantitative and qualitative functions. While modern peer review basically dates to mid-20th century and after World War II, it has not been applied in a uniform manner nor has it earned the approval of those who were supposed to implement it. A number of editors used peer review unevenly and not in an orderly manner. Ingelfinger, well-known editor of *The New England Journal of Medicine*, maintains that the first editor of *The American Journal of Medicine* decided on the vast majority of submissions himself and gave an answer within 1 or 2 weeks of manuscript's receipt (Ingelfinger, 1974). In a study published in 1963, almost 25% of the journals surveyed did not use some sort of peer review (16% did not at all and 8% gave equivocal answers). One sample consisted of 156 well-known scientific journals from 10 countries "where research is considered good" (Porter, 1963, p. 1014). The editor of *The American Journal of Psychiatry* from 1965 to 1978 recognized that peer review was not used prior to his tenure but he did implement it during the years he was editor (Braceland, 1978). As late as 1977, the editor of *The Lancet* questioned the viability of peer review in these terms: "I am a convinced opponent of routine peer review of articles. The experts' pronouncements tend toward cautious conservatism; they are not invariably beyond misplacing the big with the bogus …" (Douglas-Wilson, 1977, p. 877). In a 1989-editorial *The Lancet* went even farther when it claimed "that in the United States, far too much is being demanded of peer review … peer review works best when you do not ask too much of it" (Peers reviewed (Editorial), 1989, p. 1116). All these pronouncements indicate an uneasy situation pertaining to the place and importance of peer review in the field of science.

In clearer terms, peer review is seen from two angles: either as an author or as a reviewer. The first tries to publish and the second try to choose the best and most acceptable manuscripts to publish. According to Spier (2002)

> The peer-review process is a turf battle. What knowledge, science or doctrine may appear in the realm of the published is the prize to be won. On the one side, we have the writers and originators of ideas, on the other, we have the gatekeepers and critics. (p. 1)

This competition has resulted in a keen kind of antagonism that has marred the publishing scene and made it source of contention which has

boiled over to become a really nasty business which does not honor science at all. Literature on the subject is led by authors who feel they have not been rightly treated and who think that they are unjustly kept out of the publishing game. It is well known that careers hinge on the famous publish or perish syndrome and that it makes scholars scramble for publication to attain tenure, advantageous jobs, financing, and other perks which comes with publication. This competition has yielded to epic exchanges between scholars as shown in the following section.

A. Bias in Peer Review

If peer review has been beset by a war of words between protagonists of the publishing game, one issue has focused the complaints scientists direct at the peer review process and that is that biases seem to be inherently embedded in the review process, or at least are part of it. One could say that bias is normal since it is a human undertaking and not a mechanical one. Humans tend to react according to their beliefs, feelings, fondnesses, tendencies, and so forth. They have agendas, goals, and orientations that may not be compatible with objectivity. Starting from this, an abundance of literature has tried to determine the intricacy of bias in peer review. Lee, Sugimoto, Zhang, and Cronin (2013) indicated that

> In the context of quantitative research on bias in peer review, it is understood as the violation of impartiality in the evaluation of a submission. We define impartiality in peer evaluations as the ability for any reviewer to interpret and apply evaluative criteria in the same way in the assessment of a submission. That is, impartial reviewers arrive at identical evaluations of a submission in relation to evaluative criteria because they see the relationship of the criteria to the submission in the same way. (pp. 3–4)

Therefore, and according to this definition, peer review strongly hinges on impartiality of reviewers and its absence, or at least its lack of it. Mahoney (1977) speaks of confirmatory bias "which is … a tendency for humans to seek out, attend to, and sometimes embellish experiences which support or 'confirm' their beliefs" (p. 1). Gilbert, Williams, and Lundberg (1994) investigated the influence of gender on the outcome of publication and acceptance. They found that there was no apparent effect on the final outcome of the peer-review process or acceptance for publication. In another study, the outcome was completely different with double blind review showing an increase in acceptance of female first-authored papers in the journal *Behavioral Ecology* leading to the conclusion there was a bias against female authors in the blind review (Budden et al., 2007). In the same vein, a study by Einav and Yariv (2006) found there was a correlation between surname

initials and promotion, tenure, and nomination to prestigious awards. The authors suspected that this alphabetical discrimination to be linked to the norm in the economics profession prescribing alphabetical ordering of credits on coauthored publications. The same analysis was replicated as a test in 35 top North American psychology departments and no relation was found between alphabetical placement and tenure status. In a controversial study, Link (1998) found that "reviewers from the United States and outside the United States evaluate non-US papers similarly and evaluate papers submitted by U.S. authors more favorably, with U.S. reviewers having a significant preference for American papers" (p. 8). In an often asked question about bias by the *Science Citation Index* (SCI) toward US publications, the study found no truth as to this contention, concluding that

> … no significant correlation has been found between the ratio of the average number of citations per publication for publications with at least one EU address and at least one US address, respectively, on the one hand, and, on the other hand, the ratio of the corresponding number of publications per journal. (Luwel, 1999, p. 549)

Surprisingly, Smart and Waldfogel found (among other results) bias in favor of low-status institutions in a study of seven major economics and finance journals in the United States for the years 1980–1985 (NBER Working Paper Series, 1996). Are articles published in so called "A" list journals better than those in less prestigious journals? It seems that this is not substantiated by results by Starbuck's (2005) study. In a rather bold move, the *as-is* journal proposes to shorten the process and, more importantly, let authors own their ideas in its publication. It also proposes to summarize the publication decision to accept or reject and let the article's fate be determined in one round of review (Tsang & Frey, 2007).

All of these critics, problems, and shortcomings were supposed to be treated and taken care of by peer review, which is an important and undeniably unavoidable part of the science construct. Advent of the Internet however, has opened a new manner for review of scientific research with a total openness which only a few have undertaken.

V. Open Processes

A. Sol Tax: The First Open Peer Reviewer?

The idea of opening the peer-review process has always been present yet it remains premised on secrecy being preponderant. Reasoning went this way: if a secret review allowed all the shortcomings to develop, openness would simply be the perfect antidote to it. With the review being in the open,

reviewers would not dare to act in an inappropriate manner. Authors would be able to see reviewers' remarks, acquaintances, and potential conflicts of interest. They would be able to judge the first-hand knowledge of topics and any foul play could be sanctioned live on the network. The first experiment with an open peer process in the subject took place in 1959 when Sol Tax founded *Current Anthropology*. He launched what he called a

> Social experiment, an academic journal that would be configured to exchange and pool ideas, information, research materials and new knowledge. We shall review for one another the major results of past research, as a basis for more fruitful intercommunication on current developments. (Tax, 1959a, p. 3)

He explains his reviewing manner in the following words, which are reproduced in extenso as it is a truly pioneering manner for its era and even into the present time:

> … because manuscripts will vary so in approach, compass, and complexity, the editors may handle them in a variety of ways:
>
> 1. Some manuscripts may be read by a few referees, and accepted and published.
>
> 2. A paper may be an important nucleus for intercommunication among specialists in the area covered by that paper. This should serve as a technique for combining the advantage of symposia (without having to travel) with the advantage of the kind of discussion found in the Letters to the Editors (without having to wait); for bringing specialists together, for pooling capabilities in areas which are increasingly difficult for one person to cover single-handed, and for drawing in people at the borderline of our science. In the case of such manuscripts, after a paper has been read and provisionally accepted here, it will be duplicated and sent to a list of readers. This list will include names suggested by the author and will have two general categories of people:
>
> (a) Readers who are also experts in the area under consideration. They may add material, argue the interpretation, or say nothing. In every case, the author will see the readers' comments and advise us on the best way to handle each reply; by incorporation in the original (with acknowledgement); by inclusion (with appropriate rejoinder); or however seems best. Thus, in one issue we shall have the core statement, the additional relevant information, the principal argument, and the rebuttal.
>
> (b) Readers whose interest at the edges of the material covered by the paper but to whom it is not so central. For example, people who approach the material either as a part of a larger whole, or as the whole of which they are primarily concerned with the parts. Thus, we shall have an inclusive and expanding framework and an opportunity to learn from other sciences and to share our findings with them. (Tax, 1959b, p. 8)

This is the kind of open peer review which some sites are experiencing currently, with a notable difference—it was done without the Internet. And this, undoubtedly, gives Sol Tax the title of the father of open peer review, a title that is so much deserved that the extreme openness and connectivity that characterizes today's world was not present in his era.

VI. Internet Era's Two Pioneering Experiences

Founded respectively in 1978 and 1996, *Brain* and *Behavioral Science (BBS)* and *Psycoloquy* represent two instances of open peer review but with different outcomes. *Psycoloquy* is not functioning anymore, and *BBS* could be considered to be the prototype of open peer-review processes.

A. Psycoloquy

This was to be an electronic counterpart of *BBS* according to Stevan Harnad (personal communication, August 5, 2014), but it was suspended with Carr restoring its archive which is meant to remain permanent. *Psycoloquy* became unsustainable financially, contrary to *BBS* which was funded by subscriptions. As of now, only an old home page appears on this link http://www.cogsci.ecs.soton.ac.uk/cgi/psyc/newpsy.

B. Brain and Behavioral Science

This represents one of the most successful and innovative journals to implement an open peer review. Its home page (http://journals.cambridge.org/action/displayJournal?jid=BBS) presents the journal as follows:

> *BBS* is the internationally renowned journal with the innovative format known as Open Peer Commentary. Particularly significant and controversial pieces of work are published from researchers in any area of psychology, neuroscience, behavioral biology or cognitive science, together with 10 to 25 commentaries on each article from specialists within and across these disciplines, plus the author's response to them. The result is a fascinating and unique forum for the communication, criticism, stimulation, and particularly the unification of research in behavioral and brain sciences from molecular neurobiology to artificial intelligence and the philosophy of the mind. (BBS home page)

Particularly significant and controversial pieces of work are singled out for open peer commentary and are also known as a "target article." They are explained in its Instruction to Target Article Authors as follows:

> If a manuscript is judged by *BBS* referees and editors to be appropriate for Commentary (see Criteria below), it is circulated electronically to a large number of potential commentators selected (with the aid of systematic bibliographic searches and e-mail Calls for Commentators) from the *BBS* Associateship and the worldwide bio behavioral science community, including individuals recommended by the author.

On the same page and in Criteria for Acceptance it goes on explaining these criteria

> To be eligible for publication, a paper should not only meet the standards of a journal such as *Psychological Review or the International Review of Neurobiology* in terms of

> conceptual rigor, empirical grounding, and clarity of style, but the author should also offer an explicit 500 word rationale for soliciting Commentary, and a list of suggested commentators (complete with e-mail addresses). (http://journals.cambridge.org/action/displaySpecialPage?pageId=5544)

As one can see, the process is rather selective and only those articles having already passed the sieve of traditional peer review and considered worthy of open commentary, would go through this rather unique process. The result is that the article is published along with the commentaries it has elicited, and the rebuttals by its author, if any, give new meaning to peer review and opens it to the whole community in a completely transparent manner.

VII. Three Examples of Open Peer Review

The above mentioned examples could all be considered variants of open peer review, each one with its specificities but lacking the cement that now makes opening of peer review possible. Some, such as *Current Anthropology* or even *BBS* when it was founded in 1978, did not have the advantage of the Internet with all its features, capabilities, speed, ubiquity, and omnipresence. These features can now enable ushering in a new manner to review science, all geared at making it less iniquitous and unfair. The three examples presented below have implemented openness in peer review but in different ways.

A. Electronic Transactions on Artificial Intelligence (ETAI)

The site http://www.etaij.org/ presents ETAI "is organized to make the best use of Internet technology, in particular by using a *new and different peer-review system* [emphasis added]" (ETAI home page). It goes farther in the "How ETAI works" tab giving the characteristic features of ETAI:

- It provides a process for open discussion about articles and feedback to authors before an article is accepted. This discussion is shown and preserved on the ETAI web site, and participants in the discussion are not anonymous.
- Unlike some other journals that use open reviewing, ETAI combines open *discussion* [emphasis added] about the article with subsequent confidential *refereeing* [emphasis added] of the article where it is decided whether or not to accept the article to the journal.
- Besides posting accepted articles and all discussions about articles (whether they were eventually accepted or not), the ETAI web site also contains other kinds of information items that contribute to, or result from the research process (ETAI home page: How ETAI works).

This rather lengthy and sometimes complex process could be summarized in the following steps.

Once one clicks on "Annual journal volumes" on the left-hand side of the page, a figure detailing the different volumes of the journal and its contents appears. Upon clicking on the issue chosen (Vol. 2, 1998 was chosen as a working example), the following information is displayed:

- Volume and year
- Editor
- ISSN (printed and electronic version)
- ETAI webpage

Articles are then displayed. In the example there were four articles. The first of these was "The Complexity of Model Checking in Modal Event Calculi with Quantifiers" by I. Cervesato, M. Franceschet, and A. Montanari. The "official citation" link under the article leads to another page which is the main access to the submission, made up of three distinct parts:

- *Text in Postscript*
  Preamble and Body—this part is unusable because it leads to a format not supported any longer and therefore not exploitable.
- *Publication Record*
  Cover Page: It is the metadata of the article including Full text, Authors, Article title, Publication type, Volume, Article number, Language, and Abstract. Under "available," is the initial date of submission and the dates of subsequent revisions. For example, the Cervesato et al. article was submitted on December 19, 1997 then first revision on March 28, 1998 and the second revision on July 29, 1998.
- *Review Discussion*

The Interaction Page and Further links parts of the web site are the most important as they detail the reviewing process live for everyone to see. Discussion about the paper is open to any person with an Internet connection. The discussion between authors and reviewers could be followed as questions are asked and answers given by authors. For example, question "Q1a" (by Paolo Liberatore) is answered by one of the authors (Montanari) in "A1a." All the six questions by three different scientists (Paolo Liberatore, Peter Jonnson, and Rob Miller) are all answered in the same manner in all openness. The examination of the whole process indicate a very lively and open discussion with authors and open reviewers exchanging thoughts and ideas referring each other to papers, links, and mathematical formulas to explain either their methodology or their view how the subject should be dealt with.

This first phase of the reviewing process is completely open. It is followed by a more traditional phase where the referees recommend acceptance or rejection and, unlike the first phase, they do it anonymously. Additional

remarks are welcome and published with the article regardless of the outcome of the decision.

The whole process is summarized in Fig. 1.

ETAI ceased operation in 2006 due to numerous reasons explained by its editor, Sandewall (2012). He explains that the structure of Artificial Intelligence (a federation of specific research) led to the creation of different areas inside the journal. One of the problems of this extreme specialization was that if a paper did not fit into a specific area it could not be submitted. Sandewall recognizes that he should have built computational software before starting the endeavor, but his eagerness to start a new experience prevailed. The added editorial work involved led to exhaustion and was probably one of the factors that led to the discontinuation of the journal after a few years of relatively successful existence. He adds that merely posting discussions on the site did not make it take off and some of the blame may be in the way discussions were launched. Finally, Sandewall adds that, in retrospect, he would have scaled up the approach by having a set of complete rules applying to all the different areas of Artificial Intelligence as well as having a computational structure ready before the start.

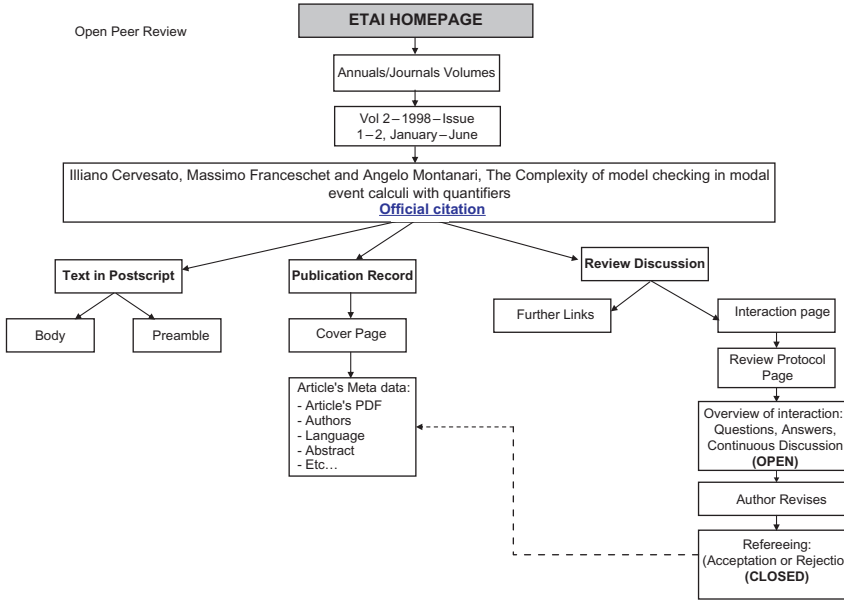

Fig. 1 ETAI'S open peer-review process.

Beside these reasons, it seems to this author that the date of ETAI founding could be another reason for its faltering. That date coincides with the first steps of the Internet and such revolutionary ideas may have doomed the experience. On the other hand, peer review is known to be very conservative and introducing such changes was, and still is, kind of courageous. Despite all that, ETAI's experience represents a highly original and open forum for reviewing. It is more original in that it combines a two-step reviewing system. It shows the process of live discussion between authors and reviewers. The second step is closer to the traditional peer reviewing but it relies heavily on the first where most of the reviewing is done.

B. Atmospheric Chemistry and Physics

Atmospheric Chemistry and Physics (ACP) (http://www.atmospheric-chemistry-and-physics.net/) is described as an An Interactive Open Access Journal of the European Geosciences Union

> International scientific journal dedicated to the publication and public discussion of high quality studies investigating the Earth's atmosphere and the underlying chemical and physical processes. It covers the altitude range from the land and ocean surface up to the turbo pause, including the troposphere, stratosphere and mesosphere. (ACP home page)

It presents its peer-review process as

> … an innovative two-stage publication process involving the scientific discussion forum Atmospheric Chemistry and Physics Discussions (ACPD), which has been designed to foster and provide a lasting record of scientific discussion; maximize the effectiveness and transparency of scientific quality assurance; enable rapid publication of new scientific results [and] make scientific publications freely accessible. In the first stage, papers that pass a rapid access peer-review are immediately published on the Atmospheric Chemistry and Physics Discussions (ACPD) website. They are then subject to Interactive Public Discussion, during which the referees' comments (anonymous or attributed), additional short comments by other members of the scientific community (attributed) and the authors' replies are also published in ACPD. In the second stage, the peer-review process is completed and, if accepted, the final revised papers are published in ACP. (See http://www.atmospheric-chemistry-and-physics.net/review/review_process_and_interactive_public_discussion.html)

Once a paper is submitted, it goes through a quick peer review to determine a minimum of methodology and is immediately put in the Atmospheric Chemistry and Physics Discussion in which the information given is traditional pertaining to the title, author(s), date of submission, and so forth. Beside this, an abstract, the full paper, and interactive discussion are all in the site and could freely be accessed. At the end,

a "Manuscript under submission for ACP" is posted. One of the first papers that had elicited a comment and also an answer was put in the site on March 12, 2014. Upon clicking on the "Interactive Discussion" button, one obtains the discussion page with the following information: the full text in PDF or XML, the title, the authors, and more. Under the "Interactive Discussion" button, one finds a number of indications such as:

AC: Author Comment
RC: Referee Comment
SC: Short Comment
EC: Editor Comment

Status and the date of the discussion paper are indicted on the right-hand side of the page (for the example presented, the paper's status is open until May 7, 2014). This submission elicited four RCs and four ACs which for the first RC details whether they are general, specific major, minor, or technical. The answer by AC responds to the different questions and explain the different phases and questioning with pictures, graphs, and the like. There was a short time span between the RC and AC (respectively March 29, 2014 and April 8, 2014) which is important as delays and slowness are among the most criticized cited and dreaded shortcomings of traditional peer review.

After a paper is submitted, a discussion period of 8 weeks is given for referees and the scientific community to comment on the paper. Each paper receives at least two commentaries from referees to be considered for discussion. The authors then have them up to 4 weeks to respond to commentaries. Papers will be published only if they have satisfactorily responded to commentaries. The Co-Editor could then either directly accept/reject the revised manuscript for publication in ACP or consult with referees in a traditional peer-review process. If necessary, additional revisions may be requested during peer review until a final decision is reached. In case of acceptance, the final revised paper is published on the ACP web site with a direct link to the preceding original paper and interactive discussion in ACPD. In addition, all referee and Co-Editor reports, the authors' response, as well as the different manuscript versions of the peer-review completion will be published. All publications (original paper, interactive comments, and final revised paper) are permanently archived and remain accessible to the open public via the Internet.

The whole, rather complex process, is summarized in Figs. 2 and 3.

The revolutionary aspect of this process is made even more innovative by the fact that some researches could elicit additional post-peer-review commentaries that could achieve publication in ACP. The site does not

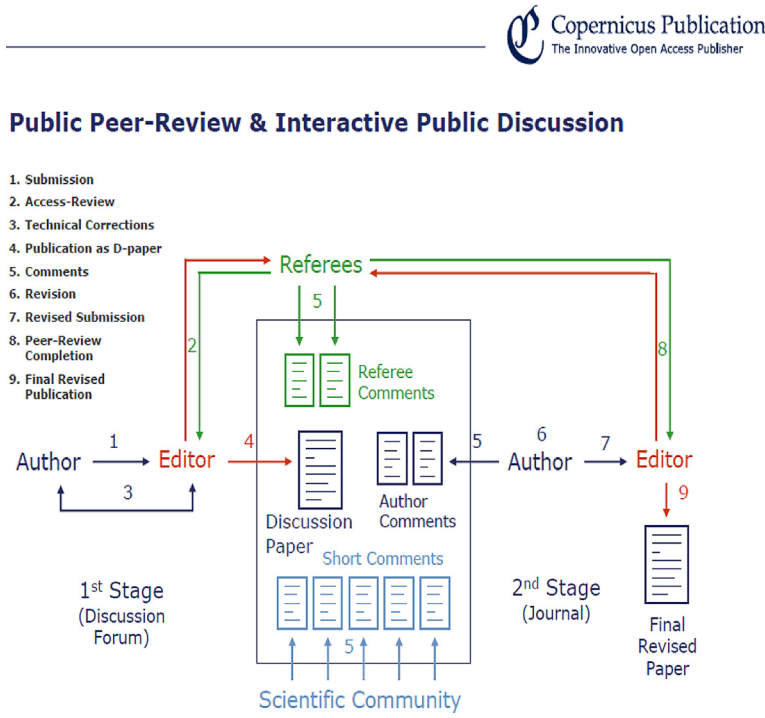

Fig. 2 Atmospheric Chemistry and Physics Discussion (ACPD).

indicate this type of publication as it does not make a difference between published in ACP and papers that have achieved post publication as a result of subsequent post-peer-review commentaries. The managing editor was asked about a possible difference or hint for these kinds of papers but the answer was "[they] do not have any data on which interactive comments later on resulted in a peer-reviewed comment/reply" (Martin Rasmussen, personal communication, July 23–24, 2014).

C. Faculty of 1000

The site http://f1000.com/ states is composed of 5000 faculty members, senior scientists, and leading experts in all areas of biology and medicine, and their associates. The Faculty recommends the most important articles rating them and providing short explanation for their selections (F1000 home page). It therefore practices what is known as *post-peer review*. It selects, among other features, already published and reviewed articles and

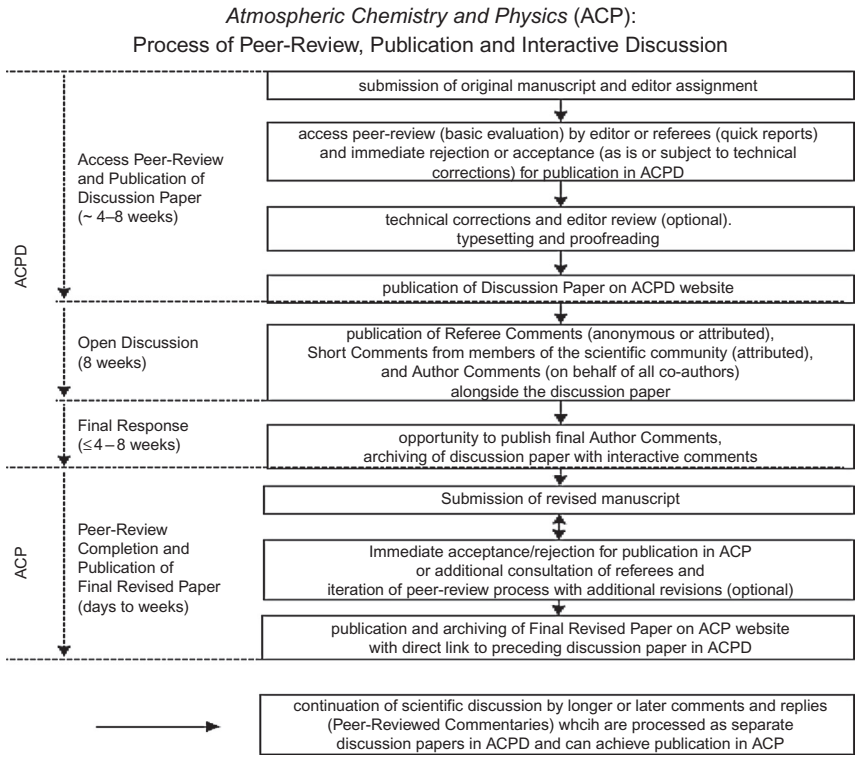

Fig. 3 Atmospheric Chemistry and Physics (ACP).

reappraises them. This is made thanks to the work of 5000 faculty members undertaking this task.

The site is made up of three primary sections which are F1000 Prime, F1000 Research and F1000 Posters.

1. F1000 Prime

This is a collection of over 145,000 recommendations covering more than 3700 peer-reviewed journals in biology and medicine, contributed by the F1000 Faculty. This section has many features, among which the most important are: Article recommendations, Rankings, F1000 Prime reports, F1000 Faculty, Journal Clubs, and Blog.

Article recommendations. This section recommends articles that members of F1000 have chosen as important. As an example, on July 20, 2014 the following information was displayed:

> Fabio Bulleri, Università di Pisa, Italy, F1000 Ecology recommended the following article and gave it a rating of 1 ⋆ "Invasive Plants as Drivers of Regime Shifts: Identifying High-Priority Invaders that Alter Feedback Relationships" by Gaertner et al. (2014)

While the top rated article for the week of July 13–17, 2014 which rated 10 ⋆ was "Collective Invasion in Breast Cancer Requires a Conserved Basal Epithelial Program" by Cheung, Gabrielson, Werb, and Ewald (2013). It received five recommendations, the most recent by Arthur Mercurio, from the University of Massachusetts Medical School who rated it Good for teaching, Interesting hypothesis, New finding, Novel drug target, and Technical advance.

Another feature is the statistics of recommendations in the last 7 days and last 30 days. On July 20, 2014, there were 246 new recommendations for the past 7 days and 194 new articles recommended. For the past 30 days, the statistics read as follow: 300 Articles classified as good for teaching, 918 classified as new finding, 16 classified as refutation, 256 classified as confirmation, 285 classified as interesting hypothesis, 92 classified as novel drug target, 100 classified as controversial, 178 classified as technical advance, 62 classified as review/commentary, and 3 as changes clinical practice.

Article recommendations are highly precise, detailed, and open. They post recommendations, authors with affiliation (sometimes with pictures), and also the degree by which they recommend the article. For example, the article cited above had 10 ⋆ and was rated from good (⋆) to very good (⋆⋆) to exceptional (⋆⋆⋆).

Beside the recommendations, F1000 Prime has a system of ranking articles. When members of F1000 rank them, they give them either ⋆, ⋆⋆ or ⋆⋆⋆ The total number of ⋆ a given article gets will allow for the rankings.

Among the rankings are:

Current top 10: On July 20, 2014, an article in *Nature* from March 2013 by Hansen, Jensen, Clausen, Bramsen, Finsen, Damgaard, and with 12 ⋆ was the most read at that date.

All time top 10: On July 20, 2014, an article in *Nature* in 2005 by Lolle, Victor, Young, and Pruitt was the most accessed and read of all time with 55 ⋆'s. This article had a dissenting opinion by Alejandro Sanchez-Alvarez which proves the extreme revolutionary side of the system with use of the Internet and the web. Sanchez-Alvarez did this knowing that his name would be seen by all readers and that the consequences to which it

could lead in a specialized and closed field where everybody knows everybody. This would have been impossible and unthinkable in the closed paper world where peers could express opinions without fear of reprisals and of being specifically named.

On July 20, 2014, three articles were classified as "hidden jewels." Hidden jewels are articles that should have had more attention but which slipped the attention of the community initially. They are therefore rediscovered. They have all gotten 6 ⋆ and a practically equal number of recommendations (between 2 and 4).

It should be noted that the last three features (All time most viewed, Current most viewed, and Hidden jewels) are all accessible only by subscription, contrary to Current top 10 and All-time top 10.

2. F1000 Prime Reports

F1000 Prime reports are more like an open access review journal but practicing a closed peer review. One of its specificities is that at least one author of each article must be, or become approved as a Faculty Member of F1000Prime, which makes the article highly regarded knowing who contributes to F1000. On July 20, 2014, there were 597 articles all freely accessible as html or PDF.

3. F1000 Research

The F1000 Research section is made up of different features which are: articles, collections, for authors, for referees, blog, advisory editorial board, about/contact, submit an article, and My F1000.

Articles. It is a list of articles published by F1000. It is the most complete part of F1000 Research as it shows article published their status, their peer review, and more. On July 20, 2014, there were 522 articles of which 370 were indexed and had gone through an open peer review. On the right-hand side of the page "awaiting peer review" which means the article has been submitted but not been reviewed yet. The complete data on the page is as follow: title, version, referee status—awaiting peer review—and authors. On the right-hand side of the page, an "Open Peer Review—Invited Referee Responses—Awaiting Peer Review—Comments—No Comments—Add Comments" square indicates the submission is still awaiting review.

The Add Comments button allows a reviewer to add his comments after signing in or registering.

Indexed article. This lists articles that have gone through the open peer review and is openly accessible on the site. The complete data in the page are title, version, referee status and a link to the report by the reviewer openly accessed, and the authors. On the right-hand side of the page, an Open Peer Review—Invited Referee Responses details the different phases which the submitted article has gone through. It cites referee remarks by name, institution, and date and also their decision pertaining to the submission. The referee puts a ☑ sign when he or she agrees to the submission. If one of the referees asked for changes or has given remarks, then a version "2" of the article is put on the site with dates of version "1" and subsequent submissions.

The referee could also accept the submission with a [?] sign which means he (or she) has reservations and has asked the authors for changes or addition. Lastly but very important, a referee could reject submission and give its reasons live on the site and put the sign ☒ next to his name. All this is done openly with the name of the referee, its institution, and the changes or remarks the reviewer has asked for along with the author's response. One should notice that referees are either chosen from F1000 Research referee panel (indicated by the names of referees on the page) or suggested by the authors (indicated by *peer reviewers invited*). F1000 insists regarding this new way of reviewing, with peers invited and chosen by the authors, to avoid conflict of interest, by not choosing colleagues or people the submitter has worked with in the last 5 years. All these criteria are checked by F1000 to ensure a bias free, and as objective as possible, review.

This phase of reviewing in F1000 denotes the extreme openness of the system. The whole process is openly accessible with authors, referees, and reviews seen and read by everybody. This is made even clearer in the outright rejection of articles or acceptation with reserves, with referees' names shown.

For referees. In this section, the prospective referees are given indication as to how their review will be performed. It is basically explained in the following lines and points which are: Pre-refereeing checks, Refereeing process, Versioning and Citation and Indexing.

Pre-refereeing checks. Articles submitted go through a quick check to see if they are scientifically sound and written in acceptable English. In case this

initial check is not satisfactory, it is returned to authors for amendment. In case this is not done in a manner that satisfies the editorial team, it is rejected. It is published in less than 7 days if it does answer the issues raised and is clearly marked as "awaiting peer review."

Refereeing process. When submitting manuscripts, authors are asked to suggest the name of five referees which will not have a conflict of interest with the work reviewed. They can also request by names a list of referees they do not want to review their manuscripts (a request F1000 will try to respect wherever possible). Referees decide whether the work seems scientifically sound. They also provide a report and status which will be displayed with the article, together with names and affiliations. Registered users (bona fide research scientists or clinicians) providing name and affiliation for public display will also be allowed to comment or referee report at any time.

Versioning. During reviewing, there are amendments to the original manuscript following remarks by reviewers. All versions of an article are accessible, and may be cited individually while the most recent version is the one displayed. All articles carry and are indexed by the CrossMark logo (CrossMark Identification Service™). This service allows viewing of the history of any given article and, when clicked upon, shows newer versions of the article and referees' reports.

All the steps describe in this section are summarized in Fig. 4, which takes into account the different steps taken by a submission for review.

VIII. Conclusion

Peer review has produced an abundance of literature, all geared to explaining what the whole review process is about, the problems it has yielded, and the solutions proposed. The subject is a highly sensitive one as it involves not only access to publication but also, and even more than that, the advantages and advancement that scientists get from publishing. The information overload that took place after World War II has hastened its reform as it became source of contention and an ever increasing crisis in the publishing world. Among the most preponderant reasons cited is the secrecy in which the whole process was conducted. The different steps undertaken from the inception of research to publication were done in a closed and secretive manner opening the door to numerous, and very often recurring, dysfunctions. Biases were documented as the most prominent cause of this situation especially combined with secrecy.

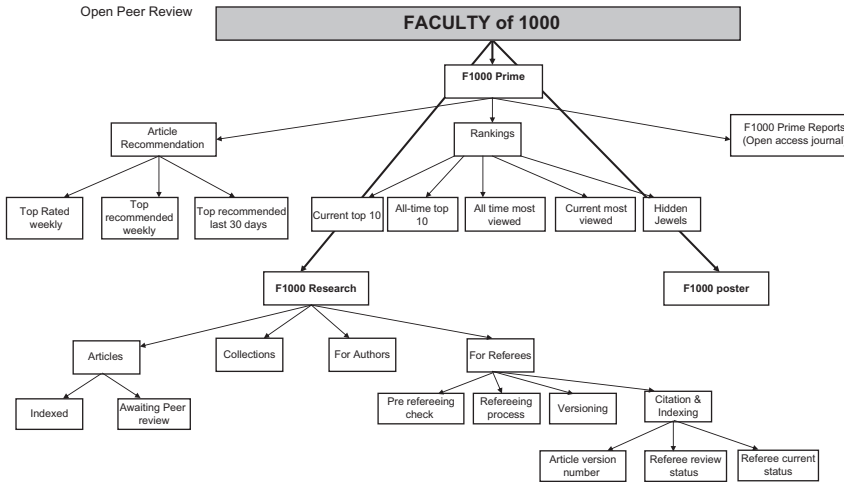

Fig. 4 F1000 peer-review process.

The advent of both the Internet and open access has allowed a much needed overhaul of the review process. From a closed and somehow biased operation, peer review became an open process subject to scrutiny. Reviewers, a pivotal part of the review process, have become more accountable and can themselves become the subject of reviews. Increasingly they undertake their work while the whole community observes. This has made them more cautious and more attentive. With flaws being in the open, the process is as close as possible to an objective operation. Peer review is unquestionably changed as science is performed live on networks. Gatekeepers are no longer the mythic and sometimes wicked people dreaded by authors.

On the other hand, various studies have not been able to determine with precision if this new openness has made peer review more equitable (Fisher, Friedman, & Strauss, 1994; McNutt, Evans, Fletcher, & Fletcher, 1990; Van Rooyen, Godlee, Evans, Black, & Smith, 1999) principally, because of its recent inception. It would be logical to think that openness would lead more moral behavior. Because the open process is still in initial phases definitive conclusions cannot be drawn. For example, many lay persons (and even professionals) see this unbridled openness as an opportunity to steal others' ideas. Some authors might not accept the fact their submissions (with all their flaws) can be seen by everybody, and corrections requested in public. Some might still prefer the comfortable and cozy anonymity of the closed paper world wherein a sub-par submission never

sees the light of the day and would simply be rejected, asked to be revised substantially, or redirected at another journal. Finally, peer review has been known (among other criticisms) to be conservative and prone to rejecting new ideas because the gatekeepers, being the leaders of the field, would lose their preeminence over those they judge. One could readily envision reluctance by senior scientists to accept revolutionary schemes because doing so could affect their hard earned fame, status, and standing in their communities.

One of the most memorable exchange related to this turf battle, as Spier (2002) described it, was an epic one between Stanley Fish and Jerry Skoblow. Fish is a seasoned scholar associated with postmodernism who argues with Skoblow about blind review. Fish sees his status, his name, his achievement as part of the submission and insists on being judged as himself, and not as an anonymous submitter. Skoblow, who incidentally was Fish's student, argues against his professor's ideas comparing them to "scholarly Reaganomics." At the same time, Fish ironizes comparing Skoblow's view of him as "the work of a hoarder who wishes to dine alone at his own table while millions starve" (Fish, 1989, p. 163). Lines are not clearly drawn and it is too early to see all drawbacks and advantages of this open access reviewing process.

The three sites studied are, at this time, some of the most revolutionary undertakings in the subject of peer review. They open peer review to the community of researchers and allow the process to become more transparent. If the experience of ETAI for example has not been able to continue, it represents the live interactivity between the different protagonists and an example of how peer review will be performed in the future. ACP pioneered a rather original process that combines open peer review and allows continuing discussion of research making articles living entities that do not stop growing once they have been published. They could in fact result in a completely new article as a result of continuing open commentaries. Faculty of 1000 seems to be the most complete and the most innovative site of those discussed in this chapter. It practices open peer review but singles itself out by practicing a post publication peer review as the article are already reviewed but chosen again to be show-cased and reevaluated a second time. F1000 is also at the forefront of the open peer-review process due to the domain it covers: biology and medicine which have been highly active in the subject. These experiences should, no doubt, be replicated and developed, and already have been in cases like *BMJ Rapid responses*, *Journal of Medical Internet Research*, and *Biology Direct*. These may well be the way science will be judged in the future because in a world as networked as it is today, secrecy, bias, cronyism, manipulation, and other perceived flaws of the paper world cannot and will not be accepted.

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Transforming Services

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Effects of Terminology on Health Queries: An Analysis by User's Health Literacy and Topic Familiarity

Carla Teixeira Lopes and Cristina Ribeiro
Faculty of Engineering, University of Porto/INESC TEC, Porto, Portugal

Abstract

Prior studies have shown that terminology support can improve health information retrieval but have not taken into account the characteristics of the user performing the search. In this chapter, the impact of translating queries' terms between lay and medico-scientific terminology, in users with different levels of health literacy and topic familiarity, is evaluated. Findings demonstrate that medico-scientific queries demand more from the users and are mostly aimed at health professionals. In addition, these queries retrieve documents that are less readable and less well understood by users. Despite this, medico-scientific queries are associated with higher precision in the top-10 retrieved documents results and tend slightly to generate knowledge with less incorrect contents, the researchers concluded that search engines should provide query suggestions with medico-scientific terminology, whenever the user is able to digest it, that is, in users above the lowest levels of health literacy and topic familiarity. On the other hand, retrieval systems should provide lay alternative queries in users with inadequate health literacy or in those unfamiliar with a topic. In fact, the quantity of incorrect contents in the knowledge that emerges from a medico-scientific session tends to decrease with topic familiarity and health literacy. In terms of topic familiarity, the opposite happens with Graded Average Precision. Moreover, users most familiar with a topic tend to have higher motivational relevance with medico-scientific queries than with lay queries. This work is the first to consider user context features while studying the impact of a query processing technique in several aspects of the retrieval process, including the medical accuracy of the acquired knowledge.

Keywords: Health information retrieval; query formulation; terminology; health literacy; topic familiarity

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I. Introduction

Patients, relatives, and friends are increasingly using the web to search for health information. In fact, this is the third most popular online activity following e-mail and using a search engine (Fox, 2011), being done by 72% of American Internet users (Fox & Duggan, 2013). The importance of an easy access to online health information is recognized by the U.S. Department of Health and Human Services which set a goal for 2020 to increase the proportion of online health information seekers who report easily accessing health information.

Although most users are satisfied with their health searches, some get frustrated or confused (Fox, 2006; Petrock, 2010). This happens more in individuals with less education as showed by the Pew Internet report (Fox, 2006). Twenty-two percent feel frustrated by the inability to find what they want (27% in those without a college degree and 18% in those with a college degree) and 18% feel confused with what they did find online (24% in those without a college degree and 15% in those with a college degree). Since educational level has a strong impact on health literacy, this is not surprising. By health literacy is meant the "capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (Kutner, Greenberg, Jin, & Paulsen, 2006).

The widespread use of the web to retrieve health information implies a large diversity of users performing this task. One characteristic that is expected to differ between users is their health literacy, a differentiation that can be caused by differences in age or education. A study that assessed the usability of 125 web sites offering health resources reported that about one-third of these sites required a college education to comprehend extracted health information (Becker, 2004).

The mismatch in languages used by health consumers and health professionals also poses a barrier to effective access to relevant information (Zielstorff, 2003). Since information may be presented at a high reading level and include medical jargon (Cline & Haynes, 2001), the ability to understand the retrieved information may fail and, if so, user's satisfaction may be at risk. In fact, this is one of the typical problems felt by consumers when performing health information searches (Kogan, Zeng, Ash, & Greenes, 2001). Other popular problems are: difficulty or inability to formulate a health query due to the lack of proper medical terms (Toms & Latter, 2007; Zhang, 2010) and the difficulty with formulating it without misspellings or use of wrong medical terms (Kogan et al., 2001; McCray & Tse, 2003).

In this research we study the effect of translating query terms between lay and medico-scientific terminologies, in users with different topic characteristics, namely, health literacy and topic familiarity. In our experiment the search engine is a "black box." We believe that a user model that considers the above context features may be used to improve health information retrieval (IR) through, for example, the suggestion of alternative queries or by re-ranking results. The work presented here is the first to consider user context features while studying the impact of a query processing technique in several aspects of the retrieval process. The evaluation considers not only users' relevance assessments, as considered in several previous works, but also the quality of the medical knowledge that emerges from the search session.

The chapter is structured as follows. A review is given of the existing literature on the exploration of medico-scientific terminologies and the use of health literacy and topic familiarity in health IR. The research questions and the experimental settings of the study are then described afterwards. The following sections have a detailed description of the findings that will be discussed along with their implications in the final section.

II. Related Work

In this section, is a literature review of works that explore medico-scientific terminologies with the goal of improving IR. In a second stage, IR works that explore the two main context features used in this work—health literacy and topic familiarity, are also discussed.

A. Exploration of Medico-Scientific Terminologies

It is known there are mismatches between consumer terminology and the ones used in health documents and standard medical vocabularies (Eerola & Vakkari, 2008). To evaluate the impact of this mismatch, Plovnick and Zeng (2004) compared the performance of consumer queries with the performance of the same queries reformulated with terminology from the Unified Medical Language System (UMLS). Each query was submitted to Google and MedlinePlus and the relevance was assessed comparing results with a gold standard answer. The authors used P@30 to compare both type of queries and, through descriptive analysis, concluded that this type of reformulation may be a promising strategy to improve consumer health information searches. Previous studies (Patrick, Monga, Sievert, Hall, & Longo, 2001; Zeng, Kogan, Ash, Greenes, & Boxwala, 2002) reached

similar conclusions. Patrick et al. (2001) compared the performance of lay and medico-scientific queries on the retrieval of diabetes web information. The evaluation was based on the number of sites maintained by nonprofit healthcare professional organizations, academic organizations, or governmental organizations that appeared in the top-20 results. Authors found fewer sites of this type when using lay queries. While studying the characteristics of consumer terminology for health IR, Zeng et al. (2002) concluded that 51% of the lay queries returned no information although matching information existed in the database.

Considering the poorer results of lay queries and the fact that nonexperts use medico-scientific terminology less often than experts (White, Dumais, & Teevan, 2008, 2009), it is expected that comprehensive terminology support improves health IR (Zeng et al., 2002). Some works therefore propose and evaluate strategies to translate lay terms into medico-scientific ones (Lu, Lin, Chan, & Chen, 2006). Others go further and present query suggestion systems (Luo, 2009; Luo, Tang, Yang, & Wei, 2008; Zeng et al., 2006) and others come up with ways to identify the mixture of terminologies in order to minimize the language gap and improve health IR (Crain, Yang, Zha, & Jiao, 2010). These works are briefly described next.

Lu, Lin, Chan, and Chen (2006) translated query terms from lay to professional ones in the context of cross language health IR (CLHIR). If the lay term appears in the Medical Subject Headings (MeSH) thesaurus, an immediate translation is made. If not, the authors propose an approximate string matching of the nonprofessional terms to the professional ones. In the other cases, they propose to use web resources with the argument that an increasing number of sites contain lay terms and their corresponding professional terms. Their evaluation showed improvements on the performance of MeSH concept mapping and CLHIR.

Luo et al. (2008) and Luo (2009) propose and evaluate two similar search engines for health IR: MedSearch and iMed. Both search engines accept long queries and transform them to shorter ones by extracting the most representative terms. Moreover, they suggest medical phrases to help the user digest the retrieved documents and refine the query. These phrases are extracted and ranked based on MeSH, the collection of crawled webpages, and the query. In addition, to help users provide information about their medical situation, iMed uses a questionnaire-based query interface. MedSearch was evaluated with questions posted on medical discussion forums and assessments from five nonmedical persons. iMed was evaluated with real medical case records from the Family Medicine Online Database (FMOD) and medical exam questions with corresponding answers as the

ground truth. In both cases, the experiments showed that the search engines handle medical queries effectively and efficiently.

The Health Information Query Assistant (HIQuA) system, developed by Zeng et al. (2006), suggests alternative query terms, selected according to their semantic distance to the user's initial query terms. Queries are first mapped to one or more concepts of the UMLS and then the semantic distance between concepts is calculated based on co-occurrences in medical literature, log data, and on UMLS semantic relations. Authors found statistically significant higher rates of successful queries, that is, queries with at least one relevant result on the top-10, but no statistical differences on user satisfaction or users' ability to complete the task.

Crain et al. (2010) propose a Bayesian model[1] to overcome the language gap between lay and medico-scientific terminology. Given a document, this model can infer the mixture of topics and dialects (slang, common, and technical) and the most likely topic and dialect of each word. Authors found a 25% improvement in normalized Discounted Cumulative Gain (nDCG) @5 when using this model to support health IR.

The interplay between user contextual features and the terminological aspects of health IR is less explored in the existing literature. From the works mentioned above, only the health search engine described by Luo (2009) collects and uses information about the user through the questionnaire-based interface. Another study investigates the effect of user factors on the familiarity with health terms and uses gender as a proxy for background knowledge about gender-specific illnesses (Keselman, Massengale, Ngo, Browne, & Zeng, 2006). Authors recruited a convenience sample of 50 users and designed an instrument to test users' familiarity with 27 health terms of different "familiarity likelihood scores" and three categories: "male," "female," and "neutral." This study's findings support the idea that background knowledge and experience affect users' familiarity with health terms. Moreover, authors conclude that health literacy is another variable expected to influence familiarity. A more recent article (Zeng-Treitler, Goryachev, Tse, Keselman, & Boxwala, 2008) uses context to estimate consumer familiarity with health terminology but the explored features are not related to the user. In the proposed method, the authors use a network in which each node represents a term and each term is connected with other terms that co-occur with it. The context of a term can be a query session, a sentence, a paragraph, or a document. The method was applied to

[1]Probabilistic model based on Bayes rule.

query logs and was validated using results from previous consumer surveys. The authors concluded that this method is a good alternative to existing term familiarity assessment methods.

B. Health Literacy in IR

Health literacy is defined as "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (Kutner et al., 2006, p. iii). A 2003 assessment of adult literacy (Kutner et al., 2006) found that 36% of adults in the United States have basic or below basic health literacy skills. A good review of the literature on health literacy was done by McCray (2005). According to this author, a substantial portion of the literature addresses the mismatch between the health literacy of the patient and the readability of the documents.

Health literacy can be assessed through several existing instruments like the Test of Functional Health Literacy in Adults (TOFHLA) (Parker, Baker, Williams, & Nurss, 1995) that takes up to 22 minutes to administer and Short Test of Functional Health Literacy in Adults (STOFHLA) (Baker, Williams, Parker, Gazmararian, & Nurss, 1999), a smaller version of TOFHLA. The Rapid Estimate of Adult Literacy in Medicine (REALM) (Davis et al., 1993) is another option, easier and quicker to administer. In non-English languages there are other tools like the Short Assessment of Health Literacy for Spanish-speaking Adults (SAHLSA) (Lee, Bender, Ruiz, & Cho, 2006) that was developed based on REALM and also incorporates a comprehension test using multiple-choice questions.

To the best of our knowledge, few IR studies consider user's health literacy. In the HIQuA study previously described (Zeng et al., 2006), the authors empirically concluded that query recommendations are not adequate for inadequate health literacy users. Another work (Wang & Liu, 2005) describes a personalized health IR system that adjusts results to users' health literacy level, but no evaluation was performed.

C. The Influence of Topic Familiarity in IR

Topic familiarity, or domain knowledge as it is also frequently referred to, can be defined as the user's general knowledge about the topic of the search task. It is acknowledged that topic familiarity can be an important factor in IR (Capra & Pérez-Quiñones, 2006) and there are several research works that explore this feature.

Studies investigating the relationship between topic familiarity and information search behavior (Kelly & Cool, 2002; Liu & Belkin, 2010; Qu, Liu, & Lai, 2010; Wen, Ruthven, & Borlund, 2006) are based on user studies and all evaluate the familiarity with the topic through users' self-assessment. They differ on the type of analyzed behaviors and, typically, these behaviors are acquired through log records of the user study. The conclusions of these studies state that, as the familiarity with the topic increases, so does the search efficacy. Moreover, the resources the user values become more specialized, the user's effort (task completion time and number of queries) decreases and the importance given to certain relevance criteria change. As can be seen through the studies described in the rest of this section, performance conclusions are not always consensual.

Regarding the relation between topic familiarity and query formulation, Wildemuth (2004), in a longitudinal study, analyzes the search terms used by medical students on six clinical problems. This is done in three occasions, one before students received any instruction on the topic, the second just after a course on the topic, and the third occurred 6 months after the end of the course. Wildemuth concluded that, when domain knowledge was very low (first assessment), users made more moves, that is, additions and deletions of concepts to the query. This is probably due to their initial inability to choose the appropriate terms and is in accordance with the conclusions of the study described above (Qu et al., 2010). Finally, Wildemuth also concluded that, although it improved performance in all occasions, system assistance during query formulation is more useful when users have less knowledge on the topic. This work also has a good literature review on the effects of domain knowledge in IR.

Another study explores the influence of topic knowledge on the use of a thesaurus for query expansion (Sihvonen & Vakkari, 2004). The authors conducted a user study with 15 users with knowledge on the topic and 15 users without it. Results were acquired through search logs and interviews with the subjects. Authors concluded that the use of thesauri was helpful for experts but not for novices in order to improve search effectiveness. The number of documents that were judged relevant by external experts measured the search success. This conclusion contradicts the conclusions from the previous study (Wildemuth, 2004).

Studies analyzing the influence of topic familiarity on IR performance focus on different aspects. Liu and Belkin (2010) considered document usefulness, and their primary goal was to know if topic knowledge could be used to predict it. Kelly and Cool (2002) considered efficacy as the ratio between the number of documents saved and the number of documents viewed. Other authors (Al-Maskari & Sanderson, 2010) investigated factors

influencing user satisfaction and found no relationship between familiarity and satisfaction. They also found no significant differences between familiar and unfamiliar users in the number of relevant documents identified by the users, the number of TREC relevant documents, and the time taken by the user to locate the first relevant documents. The same authors conducted a user study (Al-Maskari & Sanderson, 2011) with 56 subjects and 56 topics from the TREC collection to analyze the influence of users' cognitive skills on user effectiveness. They asked users to assess familiarity after completing the search for each topic and found no significant correlation between familiarity and users' perceptual speed. Another study (Muresan, Cole, Smith, Liu, & Belkin, 2006) used the TREC HARD track (Allan, 2003) to examine the impact of document characteristics like readability and concreteness/abstractness on document relevance assessments by users with different levels of familiarity with the topic. Authors concluded that a higher readability has positive effects on retrieval performance, regardless of user's familiarity with the topic.

Only one study was found that considered users' topic familiarity in health IR (Lopes & Ribeiro, 2010). Its authors studied the impact of several context features on query formulation and relevance assessment in health searches and concluded that, in more familiar tasks, users employ medico-scientific terminology more often and formulate longer queries. Moreover, authors found that relevance decreases as the familiarity with the topic increases.

III. Methodology

A. Research Questions

Two research questions drove the research described in this chapter. The questions are similar in their aims but differ in the object of analysis:

- What is the impact on *the characteristics of the retrieved documents* of replacing lay query terms by medico-scientific ones? (RQ1)
- What is the impact on *search task precision* (RQ2), *users' comprehension of documents* (RQ3), *accuracy of the medical knowledge* (RQ4), *task completion status* (RQ5) of replacing lay query terms by medico-scientific ones, in users with different levels of health literacy and topic familiarity?

RQ1 does not consider Health Literacy (HL) or Terminology Familiarity (TF), because the characteristics of the retrieved documents are the only surveyed feature that does not depend on the user.

To answer the research questions, a laboratory user study with the following settings was conducted.

B. Information Needs and Queries

Eight health information needs were defined based on questions submitted to the health category of the Yahoo! Answers service. From the list of open questions in this category in decreasing order of popularity, the information needs satisfying the three following requirements were selected. Since most of the health searches on the web continue to be about diseases (Fox, 2006, 2011), information needs were focused on questions about treatments to diseases/conditions. Because the goal of this study is to study the effects of lay and medico-scientific queries in users with different characteristics, it was ensured that, for each information need, queries were different. For that reason, the disease/condition also had to be associated with different syntaxes in both terminologies, as defined in a glossary of medico-scientific and popular medical terms developed in a European project (Stichele, 1995). For example, diabetes would be excluded because it is simultaneously a lay and a medico-scientific term. Moreover, each query had to have at least 30 results in each search system used in this study.

The selected information needs were:

- About 3 days ago, I started having a burning feeling every time I urinated. How should I treat this?
- For the past 5 days my head has been very itchy and I don't have lice. What can I do to stop the itching?
- I have high uric acid (8.0 mg/dL) with reference units 3.6–7.7. How can I lower my uric acid level?
- I am suffering with an inflammation on my lips and mouth area for more than a year. I have difficulties eating. What can I do to treat it?
- My father got bit by a dog and is in the hospital with a bone infection. How is this treated?
- I frequently get heartburn even when I stay away from spicy stuff. What can I do to prevent it?
- I have been noticing lots of hair coming out from my head. Usually I only comb my hair once a day. What can I do to stop losing my hair?
- I'm on the computer all day so I type a lot and use the mouse. My right pointing finger is starting to give me some joint pain. How I can treat my finger?

The researchers defined the queries for each information need whereas the users only assessed the documents retrieved with the queries. Medico-scientific and lay queries were built concatenating the symptom or disease in each terminology with the word "treatment." For each disease/condition, the lay and medico-scientific terms were extracted from the glossary of medico-scientific and popular medical terms mentioned earlier. As an example, the medico-scientific query for the first information need would be *dysuria treatment* and the lay one would be *painful urination treatment*. Although smaller and less current than other existing consumer health vocabularies, this glossary was not restrictive in the selection of information needs.

Moreover it is singular for its multilingual characteristics that were needed for a parallel study with different aims.

C. Retrieval Systems

Google was used as a "black box" search engine with two different collections, the entire Google index and the set of pages indexed by Google that belong to HONCode certified sites. Google custom search was used to limit the second collection to those specific sites. This certification is proposed by the Health On the Net Foundation (HON) to help assess the accuracy of health content and the credibility of the publishers. For each query, the top-30 results from each retrieval system were collected.

To reduce the risk of Google learning from the previous submitted queries, it was ensured that the returned links were never clicked. Further, to prevent changes in the search engine or in the HON collection, all queries were submitted within a very short time span.

D. Tasks

The combination of a query and a retrieval system led to a task that can be executed by a user. Each user was assigned a set of eight different tasks. In the assignment of the tasks to users a Latin square-like procedure was applied so that all users assess the relevance: (1) of all information needs, but only once each; (2) of queries of both types of terminology, the same number of times; and (3) in all the retrieval systems the same number of times. The order of tasks was permuted to avoid possible bias of relevance assessments owing to human behavior. Moreover, each iteration of relevance assessments (4) contained queries of both types of terminology and (5) had tasks in both retrieval systems the same number of times.

E. Search Procedure

Users started answering a quiz to evaluate their health literacy. They then answered a questionnaire where they were asked about their familiarity with the medico-scientific terms associated with the information needs. Although users did not assess documents retrieved with their own queries, they were asked to provide the query they would formulate for each information need. After this questionnaire, users enrolled in a sequence of eight tasks. Every task is associated with a single query defined on top of the associated information need and the type of query. In each task, users had to assess the relevance of the top-30 URL retrieved with that specific query and then fill a post-search questionnaire.

For each URL, the user had to indicate the type of the document; its relevance to the information need considering his own context; and how much he comprehended its content. Relevance and comprehension were assessed in a 3-value scale. For relevance, the three values were "not relevant," "partially relevant," and "totally relevant," denoted by 0, 1, and 2, respectively. For comprehension, the three values were "I did not understand the document's content," "I partially understood the document's content," and "I understood the document," denoted by 0, 1, and 2, respectively.

In the post-search questionnaire users are asked (1) if they have already searched for that topic, (2) to evaluate the task in terms of familiarity, (3) to evaluate their feeling of success with the task, and (4) to indicate treatments for the condition mentioned in the task.

F. Health Literacy Assessment

Since there isn't any Portuguese instrument to assess health literacy, SAHLSA was adapted to this language because, when compared to English, Spanish is closer to Portuguese. The 50 medical concepts used in SAHLSA were translated to Portuguese and users were asked to associate each concept to one of two terms, in less than 4 minutes. Users were instructed not to guess the answer. With SAHLSA, if users score less than 37, they have inadequate health literacy. Users were grouped in three classes (inadequate, elementary, and good) based on the SAHLSA threshold and clusters obtained through hierarchical clustering.

G. Topic Familiarity Assessment

To evaluate topic familiarity, users were asked if they had previously searched for that topic. They also had to evaluate task familiarity in a 5-value scale and say if they knew the meaning of the medico-scientific concept behind the disease/condition associated with the information need. To compute a single measure to assess topic familiarity (Combined Topic Familiarity—CTF), the previous metrics was combined as follows:

$$\mathrm{CTF} = \mathrm{TaskFam} + 3 \times \mathrm{PreviousSearch} + 2 \times \mathrm{KnewMSTerm}$$

This formula considers that TaskFam is assessed in a 1−5 scale, PreviousSearch as 0 or 1, and KnewMSTerm as 0 or 1. The user's task familiarity assessment is considered the most important feature, followed by the existence of previous searches about the topic and the knowledge of the medical term. CTF is an integer that varies between 0 and 10. Since this is a discrete variable and 10 categories are not justifiable, CTF was grouped in

three categories of familiarity: unfamiliar ($CTF \leqslant 3$), somehow familiar ($3 < CTF < 7$), and familiar ($CTF \geqslant 7$).

H. Medical Accuracy Assessment

In the post-search questionnaire, users had to write an answer to the information need that drove the task. A medical doctor evaluated this answer in relation to the correct and incorrect content it possessed. Answer correctness was evaluated in a scale of 0 (inappropriate answer) to 2 (appropriate answer). The middle value (1) was used for answers with "some value." In terms of answer's incorrectness, user's answer was classified with 0 (all or almost all content is incorrect), 1 (some incorrect content), or 2 (no incorrect content). To exemplify the independence of these characteristics, consider the answer "Reduce the ingestion of red meat. Increase weight." to the information need given as example. This answer has some correct content but it's not complete and would be classified with 1 in terms of correctness. In addition, it also has some incorrect content, being assessed with 1 in terms of incorrectness. If this answer did not contain the second sentence, its incorrectness assessment would change to 2. On the other hand if it had several other wrong suggestions, it could be classified with 0 in terms of incorrectness. Answer's correctness and incorrectness values were added into a single variable called "medical accuracy" that, therefore, varies between 0 (lowest accuracy) and 4 (highest accuracy).

To evaluate the reliability of the medical assessments, a second medical doctor judged 30% of the answers and the inter-rater reliability was estimated through the weighted Cohen's Kappa, an adaptation of Cohen's Kappa to ordinal scales that treats disagreements differently. The measured weighted Cohen's Kappa, with squared weights, for the correctness ratings is 0.68 (95% CI: [0.54, 0.77]), indicating a substantial agreement. For the incorrectness ratings, this measure is 0.7 (95% CI: [0.48, 0.84]), also pointing a substantial agreement. These inter-rater reliability results assure the quality of the initial ratings.

I. Readability Assessment

Document readability was automatically evaluated using the SMOG (Simple Measure of Gobbledygook) metric defined as:

$$SMOG = 1.043\sqrt{30\frac{\#polysyllables}{\#sentences}} + 3.1291$$

This metric was adopted because it has been recommended as a measure of readability in consumer-oriented healthcare documents (Fitzsimmons, Michael, Hulley, & Scott, 2010). To compute SMOG, the main content of the documents was extracted, excluding components like menus, advertising, footers, and headers. Then, the HTML tags were excluded to obtain a text document with the main contents of the original one. With this document, SMOG was computed using a readability metrics API that is available at http://ipeirotis.appspot.com/readability-api.html

J. Summary of Context Features

A summary of the context features used in this study can be seen in Table 1. One feature was only related to the user, two features related the user and the document, three features relate the user with the task, and the others are only related to the document. Along with feature' categories and description, the scale of the associated variable is also presented. In the description of documents' features are distinguished the ones that are automatically computed and the ones that require human intervention. All these features were used in the analysis of the data.

K. Users

Forty information science undergraduate students participated in this study (25 females; 15 males) with a mean age of 22.25 years (SD=6.42). In the health literacy test, evaluated in a 0−50 scale, users had in average 45.48 (SD = 5.97). These results show that, globally, users have good health literacy. Users are distributed by health literacy classes as: Inadequate (9 users), Elementary (13 users), and Good Literacy (18 users).

User familiarity with a topic depends on the task's subject. A global analysis demonstrated that topic familiarity is mostly low. As said before, CTF varies between 0 and 10 and its mean value is 3.92 with a standard deviation of 2.18. Pairs "user, topic" are distributed by the proposed topic familiarity categories as follows: Unfamiliar (161 pairs), Somehow familiar (113 pairs), and Familiar (46 pairs). Through this distribution, it can be seen that the majority of tasks presented a topic unfamiliar to the user.

In an open question, users were asked about the difficulties they have when performing health web searches. Two of the most frequent pointed issues were "finding medical terminology to formulate the query" and "dealing with the quantity of medico-scientific terminology found in the retrieved documents," both found in 21% of the answers.

Table 1
Context Features Used in This Study

Category	Context feature	Scale	Description
User	Health literacy	SAHLSA score between 0 and 50. Grouped in inadequate, elementary, and good health literacy.	Grade obtained in the adapted SAHLSA health literacy assessment test.
User and Document	Relevance	Ordinal scale of 0 (not relevant) to 2 (totally relevant).	Obtained through users' assessment for each document.
	Comprehension	Ordinal scale of 0 (not understood) to 2 (totally understood).	Obtained through users' assessment for each document.
User and task	Combined topic familiarity	Varies between 0 and 10. Grouped in three classes: unfamiliar, somehow familiar, and familiar.	Combined three user's assessments: task familiarity, previous searches on the topic, and knowledge on the medico-scientific term behind the topic.
	Answer's medical accuracy	Varies between 0 and 4.	Obtained through a medical evaluation of users' answers in terms of their correct and incorrect contents.
	Motivational relevance	Ordinal scale of 1 (disagree) to 5 (agree).	Motivational relevance relates the user's goals and motivations with the information objects. It is expressed by the user's feeling of success and his satisfaction (Saracevic, 1996). Obtained through the following post-search question "I believe I succeed in this task" as perceived by the user.

Document	Readability	Rational.	Obtained through the SMOG readability measure. Automatically computed.
	Type of document	Nominal: webpage, pdf, ppt, doc, or other.	Identified by users and manually validated when inconsistencies were found.
	HONCode certification	Nominal: yes or no.	Positive if it is in the answer set of both retrieval systems. Automatic extraction.
	For consumers?	Nominal: yes or no.	Positive if it belongs to the consumers' category in the HONCode classification of documents. Automatically computed.
	For professionals?	Nominal: yes or no.	Positive if it belongs to the professionals' category in the HONCode classification of documents. Automatically computed.

IV. Data Analysis

The data analysis was done using descriptive and inferential statistics. Differences between populations were visualized using boxplots that graphically describe variables and their dispersion depicting the 25th percentile (Q1) subtracted of 1.5 of the interquartile range, Q1, the median (Q2), the 75th percentile (Q3), Q3 plus 1.5 of the interquartile range, and outliers.

In terms of inferential statistics it was used the strategy presented in Fig. 1. Whenever possible a parametric test was applied instead of a non-parametric due to the former's greater statistical power. The selection of the hypothesis test depends on the number of groups to be compared and on the scale of the variable that is being compared. Whenever a nominal variable is involved, as happens in almost all documents' characteristics, the test of equal proportions with the chi-squared value was used. Note that, when comparing two samples, the chi-squared test for equality of two proportions is the same thing as a z-test since the chi-squared distribution with one degree of freedom is the square of a normal deviate one. In situations where ordinal variables are involved, the Mann–Whitney test was employed and used the W letter to indicate the test value. In variables with a ratio scale, whenever it was possible the t-test was applied. In the other situations the

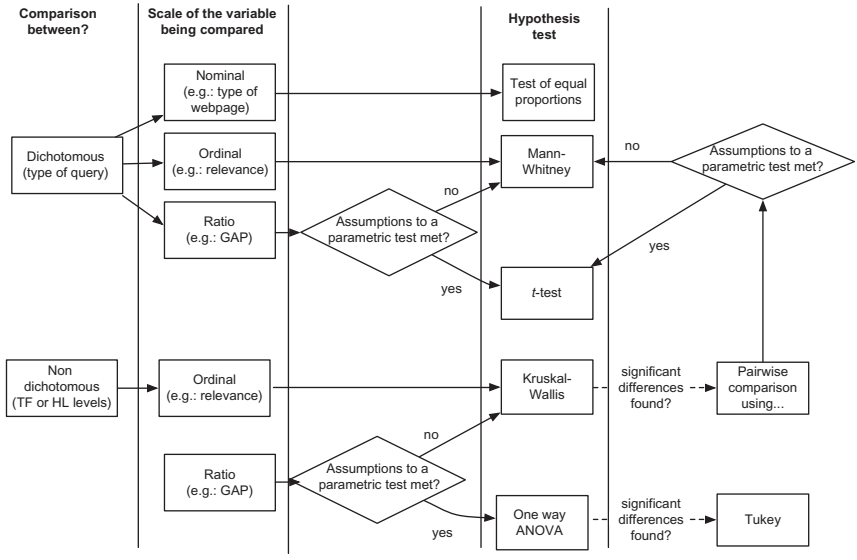

Fig. 1 Inferential statistical strategy.

Mann–Whitney test was applied. The only exception occurs in the SMOG analysis, where the Welch *t*-test was applied, because there were differences in both groups' variance. The Welch *t*-test is an adaptation of the *t*-test intended for use with two samples with unequal variances. When more than two groups are being compared the one way ANOVA or the Kruskal–Wallis test (KW) was initially applied to verify if there were significant differences between the groups and, if so, either a Tukey's test or a pairwise comparison was applied. In the pairwise comparison the Bonferroni correction was applied, dividing α by the total number of comparisons to minimize the type I error. These comparisons identified location of the differences.

A. Document Characteristics Analysis (RQ1)

This study involved the evaluation of 1652 URLs. From these, 879 were retrieved through queries with lay terminology and 886 through queries with medico-scientific terms, with 113 URLs being retrieved through both types of queries.

As can be seen in Table 2, queries with medico-scientific terminology led to more HTTP Errors and more "no content" errors than queries without it. However, none of these differences are statistically significant.

In terms of document type, both types of queries retrieved mostly webpages (Table 2). This proportion is significantly higher in the first type of queries. The Portable Document Format (pdf) is the second most common type of document in both types of queries and its proportion is significantly higher in queries with medico-scientific terminology. Just like pdf documents, PowerPoint and Word documents are more frequent in queries with medico-scientific terminology, yet neither of these proportions is significantly different between types of queries. The larger proportion of non-webpages retrieved by queries with medico-scientific terminology indicates that this type of queries retrieves more documents not specifically built for the dissemination of health information on the web.

The proportion of HONCode certified pages is very similar in both types of queries (Table 2). As expected, queries with lay terminology retrieved more consumer-oriented documents (classified as "for patients" by the HON), a difference that is statistically significant. In terms of medico-scientific documents the opposite happens, that is, queries with medico-scientific terminology retrieve more medico-scientific documents (classified as "for health professionals" by the HON), also a statistically significant difference.

As explained before, document readability was assessed through the SMOG metric. Overall, SMOG ranged from 3.71 to 33.09 with a mean of

Table 2
Differences in Documents' Features for Both Types of Queries

	Feature	Lay queries	Medico-scientific queries	Significant differences?
Errors	% HTTP errors	0.57	1.02	No
	% No content errors	0.23	0.68	No
Document type	% Webpages	95.8	86.22	$\chi^2(1) = 47.17$, $p = 3.25 \times 10^{-12}$
	% PDF	4.13	12.7	$\chi^2(1) = 40.78$, $p < 8.54 \times 10^{-11}$
	% PowerPoint docs	0.11	0.57	No
	% Word docs	0	0.46	No
HON certification	% Certified pages	53.01	52.71	No
	% Consumer-oriented pages	33.9	26.64	$\chi^2(1) = 10.7$ $p = 5 \times 10^{-4}$
	% Professional-oriented pages	5.12	14.67	$\chi^2(1) = 44.02$, $p = 1.62 \times 10^{-11}$
Readability	Mean SMOG	7.17	7.69	Welch's $t(8751.1) = -9.06$, $p < 2.2 \times 10^{-16}$

7.94 (SD = 2.35). As expected, documents retrieved with queries containing medico-scientific terminology are more difficult to read (Table 2). Since the two samples are not homogeneous in variance, the Welch's t-test was used and showed that the difference between both medians was statistically significant.

1. Summary

Our findings show that, replacing lay query terms by medico-scientific ones results in retrieving a smaller proportion of webpages, a large proportion of pdf, less consumer-oriented documents, more professional-oriented documents, and less readable documents. The smaller proportion of webpages

indicates medico-scientific queries retrieve more documents not specifically built for the dissemination of health information on the web. Since the HON classifies the majority of the documents retrieved with medico-scientific queries as "for health professionals," it can be concluded that users have to be better prepared to access contents retrieved with these queries. This is confirmed by these documents' lower readability.

B. Precision Analysis (RQ2)

To evaluate precision Graded Average Precision (GAP), Graded Precision at 5 (gP5) and Graded Precision at 10 (gP10) were used. These measures were proposed by Robertson, Kanoulas, and Yilmaz (2010), based on a probabilistic model that generalizes average precision to the case of multi-graded relevance. These measures consider a model in which the user has a binary view of relevance even when using a nonbinary scale of relevance. In this model, each point of relevance in the scale has a probability (g_i) of being the grade from which the user considers the documents relevant. The GAP and

$$gP@n$$

measures are defined as:

$$\mathrm{GAP} = \frac{\sum_{n=1}^{\infty} \frac{1}{n} \sum_{m=1}^{n} \delta_{m,n}}{\sum_{i=1}^{c} R_i \sum_{j=1}^{i} g_j}$$

$$\delta_{m,n} = \begin{cases} \sum_{j=1}^{\min(i_m, i_n)} g_j & \text{if} \quad i_m > 0 \\ 0 & \text{otherwise} \end{cases}$$

$$gP@\,n = \frac{1}{n} \sum_{m=1}^{n} \frac{\sum_{j=1}^{\min(i_n, i_m)} g_j}{\sum_{j=1}^{i_n} g_j}$$

where g_i is the probability that the user sets the threshold at grade i, that is, in a relevance scale of $\{0 \ldots c\}$, he considers grades $i \ldots c$ as relevant and the others as nonrelevant; R_i is the total number of documents in grade i for this query; i_n is the relevance grade of document at rank n. If $i_n > 0$, document at rank n will contribute to the calculations. More details on these

measures can be seen in the paper of Robertson et al. (2010). Based on the evaluation results presented by GAP's proponents, an equally balanced $g1$ and $g2$, that is, $g1 = g2 = 0.5$ was used.

These measures are based on relevance assessments made by the participants. Like in Borlund (2003), it is assumed that these assessments represent the value of the documents for a particular user at a particular moment, and thus can only be made by the user at that time. Additionally, while the current practice in IR involves the use of a gold standard to compute precision, this was intentionally done this way because this work is not interested in topical relevance as classic works usually are. Instead it is interested in situational relevance that encompasses cognitive relevance and can only be assessed through user judgments. Saracevic (1996) distinguishes these types of relevance as:

- Topical relevance: the relation between the query's topic and the documents' topic;
- Cognitive relevance: relation between the state of knowledge and cognitive information need of a user, and the retrieved documents, being inferred from criteria like cognitive correspondence and informativeness;
- Situational relevance: the relation between the task at hand and the retrieved documents, being inferred by criteria like usefulness in decision making, appropriateness of information in resolution of a problem, and reduction of uncertainty.

Only by studying situational relevance can the influence of health literacy and topic familiarity be fully explored. For example, documents about the topic that are not understood by the user are not considered useful for the situation at hand.

The initial analysis is global and does not consider user context features. In Fig. 2 six boxplots are presented. For each of the three precision measures, a boxplot is presented for each type of query, with and without medico-scientific terms. It is possible to see that queries containing medico-scientific terms tend to have higher precision with every measure. However, the only significant difference was found with gP10 at $\alpha = 0.05$ ($t(317.6) = -1.70$, $p = 0.045$). This means that, in the top-10 results, medico-scientific queries retrieve a higher proportion of relevant documents.

GAP distribution by health literacy and query type can be visualized in Fig. 3. Similarly to the global tendency, GAP tends to be higher in queries with medico-scientific terminology in every level of health literacy. However, no significant differences in GAP between types of query in each level of health literacy were found. In each type of query, the differences between levels of health literacy were also tested and no significant differences were found. Although nonsignificant, the higher GAP of medico-scientific queries in the lowest level of health literacy surprised us. Comparably to what happens with GAP, no statistically significant

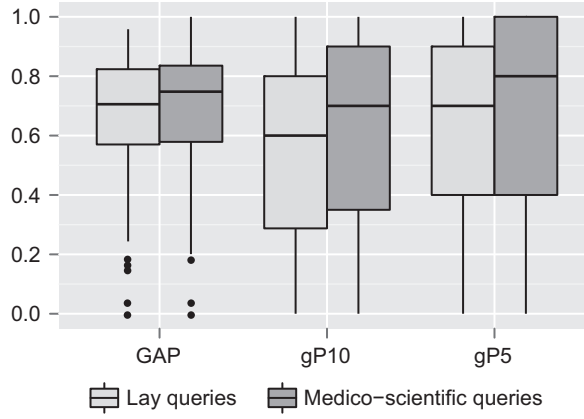

Fig. 2 GAP, gP10, and gP5 boxplots by type of query.

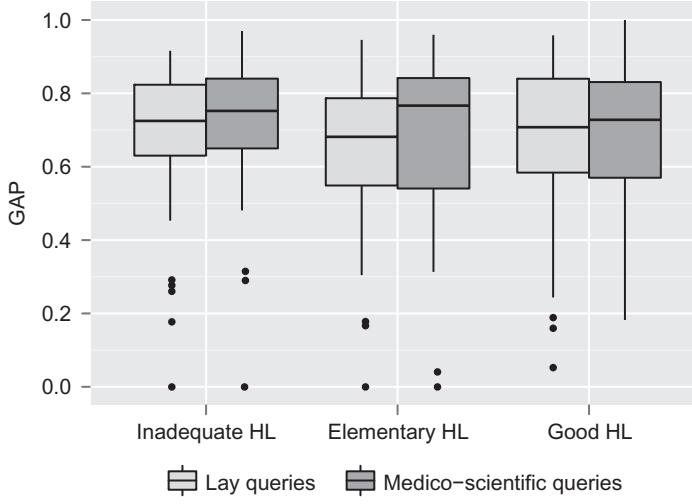

Fig. 3 GAP by type of query and health literacy level.

differences were found with gP5 and gP10 between types of query in each level of health literacy and between health literacy levels in each type of query.

In Fig. 4 GAP distributions per query type and topic familiarity are presented. As with health literacy, there is a tendency to have higher GAP

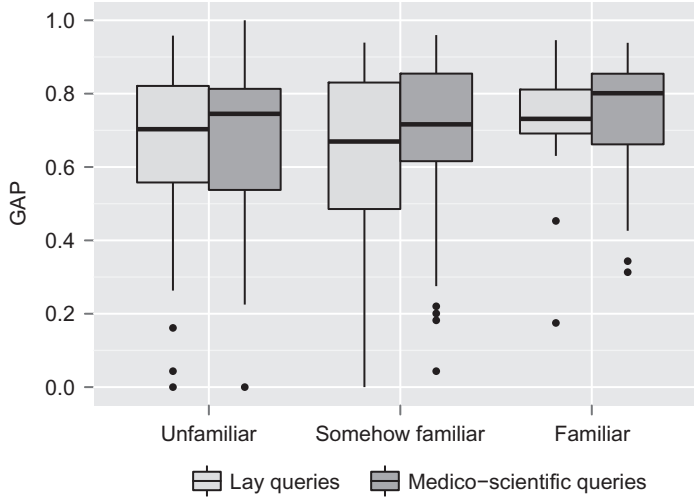

Fig. 4 GAP boxplots by type of query and topic familiarity level.

in medico-scientific queries in all levels of topic familiarity. However this is just a tendency since none of the differences is statistically significant. Similarly, there are no significant differences in the mean GAP between levels of topic familiarity in each type of query. In terms of gP5 and gP10, the only statistically significant difference was found on the "somehow familiar" level using gP5. Users of this level were found to have sessions with higher gP5 mean in queries with medical terminology than without it ($t(111)=-2.1$, $p=0.019$).

1. Summary

Medico-scientific queries show a higher precision in the top-10 retrieved results. This agrees with previous studies (Patrick et al., 2001; Plovnick & Zeng, 2004; Zeng et al., 2002) that, through descriptive statistics, conclude that this type of queries leads to better results. The analysis by users' health literacy revealed no significant differences in all the comparisons made. This was surprising because medico-scientific queries were expected to have lower precision than lay queries in users with inadequate health literacy levels. Regarding the topic familiarity analysis, medico-scientific queries were found to have a higher precision in the top-5 retrieved results than lay queries on users "somehow familiar" with the topic. No significant

differences were found in the mean GAP between levels of topic familiarity in each type of query which agrees with Al-Maskari and Sanderson (2010) who found no significant differences between familiar and unfamiliar users in the number of relevant documents.

C. Comprehension Analysis (RQ3)

In general, users understand documents well because the comprehension median is 2 (totally understood) in a scale of 0−2. However, if this analysis was repeated by query type, it could be seen that, in lay queries, the median is still the same but, in medico-scientific queries, it drops to 1. These medians are significantly different ($W = 13{,}025{,}482$, $p < 2.2 \times 10^{-16}$).

In Fig. 5 the proportion of documents by level of health literacy, query type, and comprehension level is presented. In this figure it is possible to see that, when compared with medico-scientific queries, comprehension is higher in documents retrieved with lay queries in every level of health literacy. Not only "totally understood" appears more often in lay queries but "not understood" documents also appear less. As can be seen in Table 3, all these differences are statistically significant.

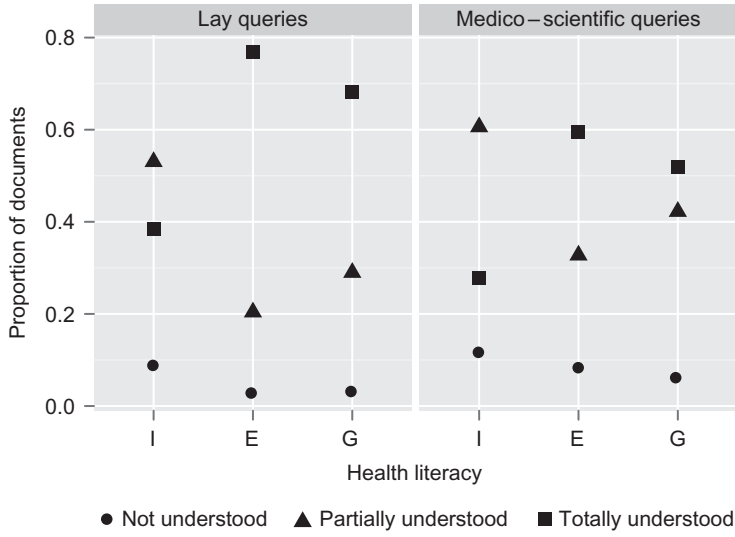

Fig. 5 Proportion of documents by health literacy (I: Inadequate; E: Elementary; G: Good), query type, and comprehension level.

Table 3
Significant Differences between the Median of Comprehension in Both Types of Queries, by Health Literacy Level

	$Comp_{Lay} > Comp_{MS}$
Inadequate HL	$W = 636{,}653$ $p = 1.104 \times 10^{-7}$
Elementary HL	$W = 1{,}398{,}119$ $p < 2.2 \times 10^{-16}$
Good HL	$W = 2{,}645{,}866$ $p < 2.2 \times 10^{-16}$

Table 4
Significant Differences in Medians of Comprehension between Levels of Health Literacy (I: Inadequate; E: Elementary; G: Good), by Query Type

	Lay queries	Medico-scientific queries
$Comp_{hl=I} < Comp_{hl=E}$	$W = 505{,}318$ $p < 2.2 \times 10^{-16} < 0.01/3$	$W = 566{,}613$ $p < 2.2 \times 10^{-16} < 0.01/3$
$Comp_{hl=I} < Comp_{hl=G}$	$W = 791{,}604$ $p < 2.2 \times 10^{-16} < 0.01/3$	$W = 845{,}470.5$ $p < 2.2 \times 10^{-16} < 0.01/3$
$Comp_{hl=E} > Comp_{hl=G}$	$W = 1{,}803{,}308$ $p = 6.366 \times 10^{-9} < 0.01/3$	$W = 1{,}715{,}570$ $p = 13.06 \times 10^{-5} < 0.01/3$

Moreover, Fig. 5 also shows that users with higher health literacy "totally understand" more documents than users with inadequate health literacy, in both types of queries. The opposite happens with "not understood" documents. Using KW test, statistically significant differences in document's comprehension between levels of health literacy were found ($KW\chi^2(2) = 440.36$, $p < 2.2 \times 10^{-16}$ in lay queries and $KW\chi^2(2) = 247.96$, $p < 2.2 \times 10^{-16}$ in medico-scientific queries). In a pairwise comparison (Table 4), it was found that comprehension in users with inadequate health literacy is lower than comprehension in users with elementary or good health literacy. Moreover, and unexpectedly, the comprehension of elementary health literate users was found to be higher than the one in users with good literacy.

In Fig. 6 the proportion of documents by level of topic familiarity, comprehension level, and query type is presented. As can be seen, the comprehension of documents by users with different topic familiarities changes

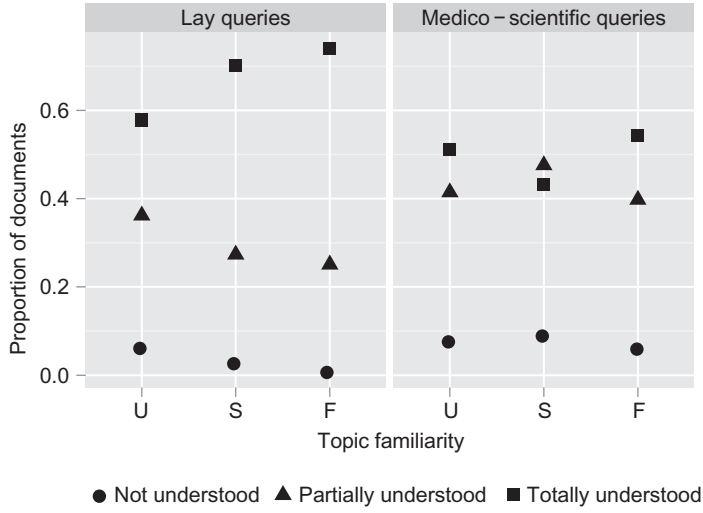

Fig. 6 Proportion of documents by topic familiarity (U: Unfamiliar; S: Somehow familiar; F: Familiar), query type, and comprehension level.

Table 5
Significant Differences between the Median of Comprehension in Both Types of Queries, by Topic Familiarity Level

	$\text{Comp}_{\text{Lay}} > \text{Comp}_{\text{MS}}$
Unfamiliar	$W = 3{,}038{,}410$ $p = 1.583 \times 10^{-6}$
Somehow familiar	$W = 1{,}785{,}294$ $p < 2.2 \times 10^{-16}$
Familiar	$W = 279{,}186.5$ $p = 9.079 \times 10^{-16}$

with the type of query. In line with the previous results, the comprehension of the documents is always higher in sessions with lay queries. As can be seen in Table 5 these differences are statistically significant.

In lay queries, as expected, the comprehension of documents tends to increase with topic familiarity. In terms of significant differences, as can be seen in Table 6, it was found that unfamiliar users understand the documents retrieved with lay queries less well than other users.

Table 6
Statistical Differences in Medians of Comprehension between Levels of Topic Familiarity (U: Unfamiliar; S: Somehow familiar; F: Familiar), by Query Type

Lay queries		Medico-scientific queries	
$Comp_{tf=U} < Comp_{tf=S}$	$W = 1{,}796{,}246$ $p < 2.2 \times 10^{-16} < 0.01/3$	$Comp_{tf=U} > Comp_{tf=S}$	$W = 2{,}068{,}034$ $p = 1.081 \times 10^{-6} < 0.01/3$
$Comp_{tf=U} < Comp_{tf=F}$	$W = 628{,}375$ $p = 8.99 \times 10^{-16} < 0.01/3$	$Comp_{tf=U} < Comp_{tf=F}$	$W = 827{,}630.5$ $p = 0.04279$
$Comp_{tf=S} < Comp_{tf=F}$	$W = 507{,}711.5$ $p = 0.01893$	$Comp_{tf=S} < Comp_{tf=F}$	$W = 5{,}345{,}930$ $p = 1.757 \times 10^{-7} < 0.01/3$

Surprisingly, with medico-scientific queries, users "somehow familiar" with the topic find documents harder to understand than users "unfamiliar" with the topic. Also, but now as expected, users "somehow familiar" with the topic understand documents less well than familiar users. As seen in Table 6 both these differences are statistically significant. In this type of queries, no significant differences between unfamiliar and familiar users were found.

1. Summary

Documents retrieved with lay queries are comprehended better than documents retrieved with medico-scientific queries. This happens in general and also at all levels of health literacy and topic familiarity. In terms of health literacy, users with inadequate health literacy understand documents less well than users with higher health literacy using both types of queries. This is in agreement with the definition of health literacy. Birru et al. (2004), who studied information literacy instead of health literacy, reached a stronger but similar conclusion, concluding that low literacy users were unable to interpret the retrieved information. Surprisingly, the same happens in users with good health literacy when compared to users of elementary literacy. In terms of topic familiarity, users unfamiliar with the topic understand the documents retrieved with lay queries less well than other users. With medico-scientific queries, users "somehow familiar" with the topic understand documents less well than users familiar with the topic but also less well than users unfamiliar with it. The latter result leads to the conclusion that topic familiarity is not a necessary condition to comprehend a medico-scientific document. Characteristics like health literacy or knowledge about medico-scientific terminology may be more preponderant.

2. Medical Accuracy Analysis (RQ4)

As previously explained, users had to provide an answer to the information need that led to the task. A medical doctor later evaluated the answers in terms of correct and incorrect contents. These two assessments were then combined into what is called medical accuracy.

Figs. 7–9 show the distributions of the medical accuracy, correct contents, and incorrect contents of the answer in each type of query. In these figures, it is possible to see that query terminology does not strongly affect these variables. The proportion of answers in each level of classification is similar and no significant differences were found in the median of each variable between types of queries.

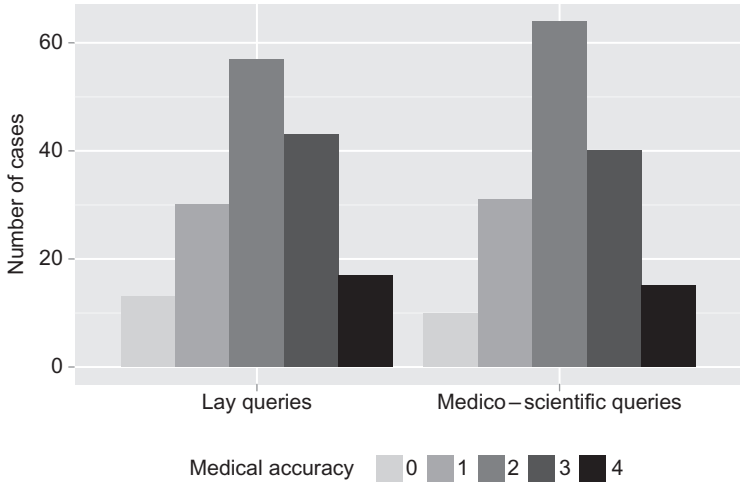

Fig. 7 Answer's medical accuracy by query type.

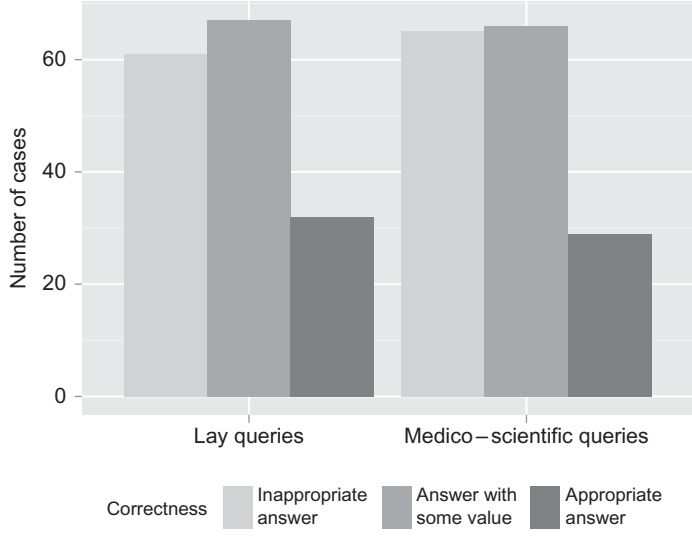

Fig. 8 Answer's correctness by query type.

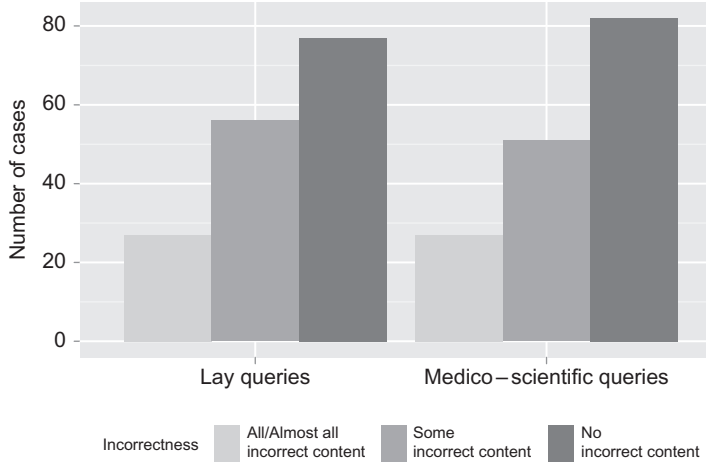

Fig. 9 Answer's incorrectness by query type.

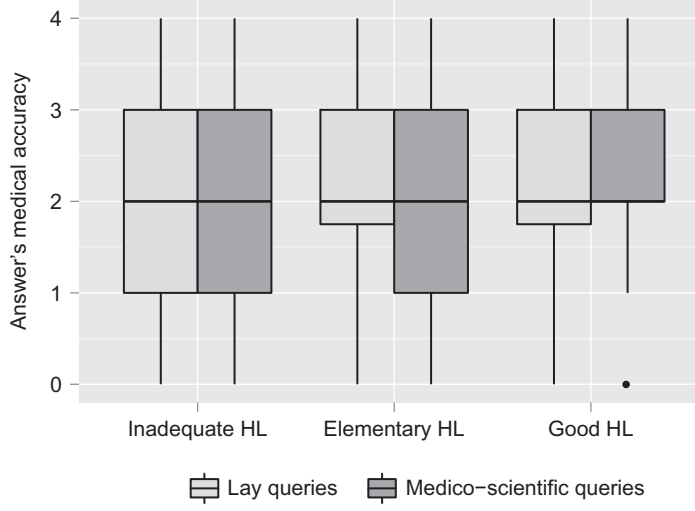

Fig. 10 Medical accuracy by health literacy and query type.

As can be seen in Fig. 10, despite a slight improvement of medical accuracy with the level of health literacy in both types of queries, the median of this variable is always 2. However, just as with answer's correctness

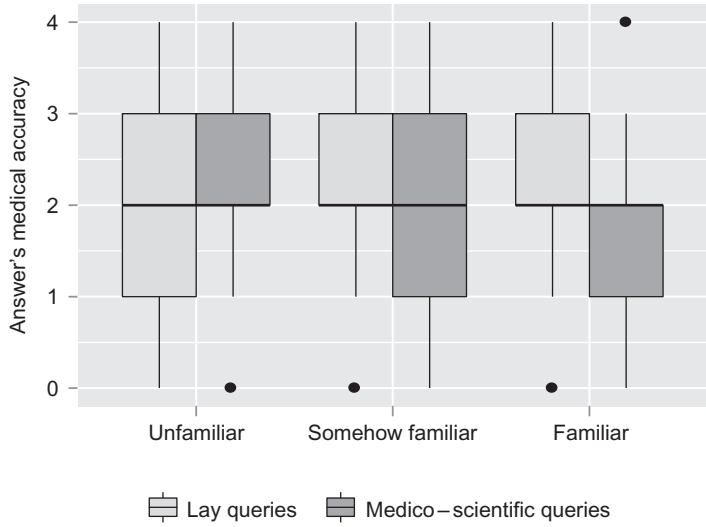

Fig. 11 Medical accuracy by topic familiarity and query type.

and incorrectness, differences are not significant. Significant differences between levels of health literacy in each type of query were not found either. The distributions of medical accuracy by topic familiarity and query type can be seen in Fig. 11. The median of this variable is always 2 and, against our expectations, medico-scientific queries seem to result in more accurate answers in users who are not familiar with the topic. Between query types in each level of familiarity, and between levels of familiarity in each type of query, no significant differences were found.

The median of answer's correctness is always 1 ("answer with some value") except in users familiar with the topic using medico-scientific queries, in which case it is 0 ("inappropriate answer"). In users familiar with the topic, the median of answer's correctness is significantly lower in medico-scientific queries ($W = 337.5$, $p = 0.03$) when compared with lay queries. In other users, no significant differences were found. In medico-scientific queries there are differences in answers' correctness between levels of topic familiarity ($\mathrm{KW}\chi^2(2) = 11.72$, $p = 0.003$). Further analysis led to the conclusion that, with this type of queries, users non-familiar with the topic give answers more accurate than those familiar with the topic ($W = 1540$, $p = 7.45 \times 10^{-12} < 0.01/3$). In lay queries, no significant differences were found. These results are surprising because familiar users were expected to be better prepared for medico-scientific queries and also to give better answers than other users, independently of the query type.

In terms of incorrect contents the tendency is symmetric to the one described above, that is, in medico-scientific queries there is a slight tendency to have answers with less incorrect content as the familiarity with the topic increases. In non-familiar users the median is 1, in those who are somehow familiar it is 1.5, and in familiar users it is 2. In spite of this tendency, no significant differences between query types in each level of topic familiarity were found. In both query types no significant differences between levels of topic familiarity were found.

3. Summary

The type of query does not affect answer's correctness, incorrectness, and global accuracy, neither in the general user nor in users with specific levels of health literacy. In terms of topic familiarity and with respect to answers' correctness, familiar users give answers with less correct content with medico-scientific queries than with lay queries. Moreover, these users give answers with less correct content than non-familiar users with medico-scientific queries. Concerning answers' incorrectness, in medico-scientific queries, there is a tendency to have answers with less incorrect content as the familiarity with the topic increases, yet a nonsignificant difference. In medical accuracy, that combines the above measures, no significant differences were found. These results probably mean that familiar users were more restrained, less verbose when giving their answers that led to answers with simultaneously less correct and less incorrect contents.

D. Motivational Relevance Analysis (RQ5)

Motivational relevance was evaluated through users' assessment of the task completion status in a scale of 1 (completely unsatisfied) to 5 (completely satisfied).

Since the median of the task completion status is 4 in both types of queries, it is possible to say that users were globally satisfied with the search sessions. The distributions in both types of queries are very similar denoting that the type of query does not interfere with users' feeling of success.

An analysis of the motivational relevance by health literacy (Fig. 12) reveals that users with inadequate health literacy feel less satisfied than elementary or good health literacy users. There are significant differences between health literacy levels in both types of queries (lay—$\chi^2(2) = 8.18$, $p = 0.017$; medico-scientific—$\chi^2(2) = 6.26$, $p = 0.044$). At $\alpha = 0.05$, in lay queries, users with inadequate health literacy feel less satisfied than those

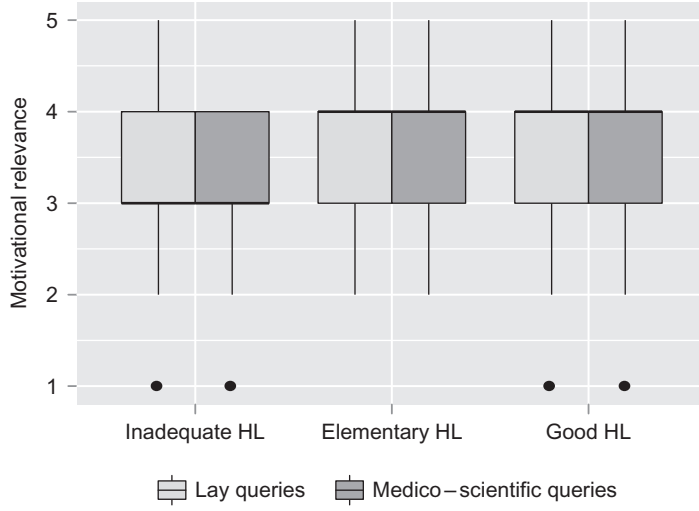

Fig. 12 Motivational relevance by health literacy level and query type.

with elementary ($W = 647.5$, $p = 0.005 < 0.05/3$) and good health literacy ($W = 961$, $p = 0.0086 < 0.05/3$). In medico-scientific queries, users with inadequate health literacy feel less satisfied than elementary health literate users ($W = 680$, $p = 0.01 < 0.05/3$). As can be seen in Fig. 12 there are no visible differences between types of queries in each level of health literacy. Through hypothesis tests the same conclusion was reached, that is, there are no significant differences in the median of the task completion status between query types in each level of health literacy.

Although the median of motivational relevance is always 4 (Fig. 13), this variable slightly increases with topic familiarity, independently of the query type. However, this is only a tendency since there are no significant differences between levels of topic familiarity in each type of query. Users familiar with the topic tend to be more satisfied with medico-scientific queries than with lay ones, but this difference is also not significant.

1. Summary

In general, the type of query does not affect motivational relevance. The analysis by health literacy revealed that inadequate health literate users feel less satisfied than elementary and good health literate users with lay queries and less satisfied than elementary health literate users in medico-scientific sessions. Through these results it is possible to see that low health literacy

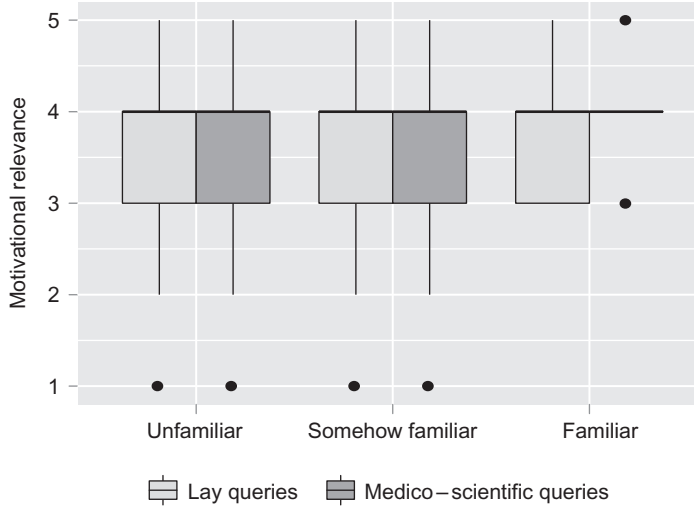

Fig. 13 Motivational relevance by topic familiarity and query type.

has a negative impact on users' feeling of success in health search sessions. In terms of familiarity, users tend to be more satisfied with medico-scientific queries than with lay ones, but this difference is not significant.

V. Discussion and Implications

As demonstrated, medico-scientific queries demand more knowledge from users. Documents retrieved with these queries are mostly aimed at health professionals thus requiring users to be better prepared in health subjects. Moreover, these documents are less readable and are less well understood than documents retrieved with lay queries. When compared with lay queries, medico-scientific queries have higher precision at the top-10 retrieved documents. Although nonsignificant, medico-scientific queries surpass lay queries in gP5 and GAP. Considering GAP, the same happens in all levels of health literacy (nonsignificant differences). Surprisingly, the same trend happens in inadequate health literate users but, since these users have higher GAP than other users on both types of queries, this probably happens because "less subject expertise seems to lead to more lenient and relatively higher relevance ratings" (Saracevic, 2007, p. 2136). This means inadequate health literate users may give higher relevance scores than users with more health literacy to documents that are less helpful to them.

Regarding medical accuracy, no significant differences were found but medico-scientific sessions slightly tend to generate knowledge with less incorrect contents and equal correct contents than lay sessions.

Comparing users with different levels of health literacy, users with inadequate health literacy understand documents less well and feel less successful than users with higher health literacy, with both types of queries. This corroborates a previous explanation stating that the former type of users assign higher relevance scores to documents that are not helpful to them. Although not significant, answers' medical accuracy tends to increase with user's health literacy. This is due to the presence of less incorrect knowledge in users with more health literacy, another trend that was found. This is true on both types of queries but is stronger in medico-scientific sessions, showing that users with higher levels of health literacy are more apt to assimilate medico-scientific documents. These findings indicate that search engines should detect inadequate health literate users and return documents with contents adequate to them.

Concerning topic familiarity, users not familiar with a topic, when compared with other users, understand the documents retrieved with lay queries less well. In medico-scientific queries, "somehow familiar" users understand documents less well than non-familiar users. This means that, in medico-scientific documents, health literacy may be more important to document's comprehension than topic familiarity. In terms of nonsignificant differences, the quantity of incorrect contents in the knowledge that emerges from a medico-scientific session tends to decrease with topic familiarity. Moreover, users who are familiar with the topic tend to have higher motivational relevance and a higher GAP with medico-scientific queries when compared to lay queries.

Our findings suggest that a personalized query suggestion system would improve the IR experience in the health domain. The usefulness of a query suggestion system has also been recognized by Toms and Latter (2007) who examined consumers searching for health information. These authors concluded that systems that provide assistance to query development are more helpful than specialized medical search engines. They infer that the key to successful queries, one of the major challenges in this type of search, is in the underlying infrastructure that supports the search process, which should be responsive to both consumers and experts. However, it is the authors' opinion that personalization should not be bipolar and distinguish only health consumers from health professionals. The personalization of the query suggestion system should be made by level of health literacy and level of familiarity with the health topic, which change with the topic and the health consumer. According to our results, users who have

inadequate health literacy or are unfamiliar with the topic should be provided with recommendations of lay queries. On the other hand, users with higher health literacy or topic familiarity should be given alternative queries with medico-scientific terminology.

A previous study suggests that nonexpert domain expertise is dynamic and may be developing over time (White et al., 2009). The approach proposed in this chapter, when compared to the bipolar personalization strategy mentioned previously, does not have the drawback of hindering learning over time for health consumers. In fact, in users who are not unfamiliar with a topic, the system, through the queries it suggests and the documents it might give access to, supports and encourages people to learn more about the topic. Yet, in users unfamiliar with the topic, the suggestion of lay queries reinforces behavior. To address this gap, either the query suggestion system, or the system that predicts the familiarity with the topic, should take into account the number of previous searches on the topic. This information might help assess if the user is prepared to receive medico-scientific queries or even if he can raise one level in the scale of topic familiarity. This should, however, be carefully studied as further work. Moreover, this approach can only be effective if the system has access to all previous searches each user has done on the topic.

VI. Conclusions and Future Work

A user study to analyze how changes in query terminology affect the health retrieval experience of users with different levels of health literacy and topic familiarity was conducted. Several aspects related to IR experience were studied, namely documents' readability, documents' comprehension, sessions' precision, sessions' medical accuracy, and motivational relevance.

Results suggest that a personalized query suggestion system would improve IR experiences in the health domain. Depending on the user, namely on his health literacy and topic familiarity, the system should provide medico-scientific or lay alternative suggestions to the query inserted by the user. This would not only give access to new types of documents but would also foster the learning of terminology that can be used in future queries. Results also suggest that users with inadequate health literacy and users who are unfamiliar with the topic should be provided with recommendations of lay queries. On the other hand, users with higher health literacy or higher topic familiarity should be given alternative queries with medico-scientific terminology.

Although this research was focused on web search, its conclusions are applicable to other types of retrieval systems. For example, when searching for health information in a library retrieval system, users have similar problems in query formulation. In addition, they continue to have different levels of health literacy and topic familiarity and therefore comprehend and assimilate documents differently. In this context, it is clear that these users can also benefit from a query suggestion system like the one described above. Moreover, this type of system could also be useful to librarians that help end-users formulating queries or finding documents.

In addition to the suggestion system, findings also suggest that search engines should detect users with inadequate health literacy and return documents with contents adequate to them, either with pictorial contents or with higher levels of readability. Moreover, readability should be incorporated in search engines ranking algorithms. In fact, it was found that readability is important to all health consumers in both types of queries and that the relevance of a document highly depends on its comprehension. Health web sites developers who want to provide information to consumers should also be aware that, if they need to use medico-scientific terminology, they should, at least, simplify the remaining contents.

As a future work it would be interesting to conduct a study specifically designed to analyze how topic familiarity can be predicted by means of past queries (e.g., proportion of queries containing medico-scientific terminology), other types of retrieval behaviors or even information pertaining the users' clinical history (e.g., the time elapsed since the diagnosis of a condition may imply higher background knowledge on that specific disease/condition). The dynamic nature of topic familiarity makes this a challenging goal.

Acknowledgments

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Academic Social Networking: A Case Study on Users' Information Behavior

Anamika Megwalu
Library, York College/City University of New York, New York, NY, USA

Abstract

Academic social networking (ASN) sites are becoming a popular communication medium among scholars. This case study was designed to explore communication behaviors of physicists, linguists, and sociologists on an ASN site called Academia.edu, their motivations for using it, and the perceived impact of their use of the site on their professional activities. Results from this study are valuable for designing computer-mediated and web-based communication media for scholars and also for adding richness to the literature related to scholarly communication. For the purpose of this study, data was collected using three different instruments: Server log, survey, and interview. Data used for analyses included a total of 20,309 server log data, 267 survey responses, and 28 interviews from scholars of Physics, Sociology, and Linguistics who use Academia.edu. Results from the study showed that the use of Academia.edu is dependent on the discipline scholars are affiliated with, their professional status, and the time of the year. Unlike physicists, linguists and sociologists are more inclined to using Academia.edu and other ASN sites. Although linguists and sociologists actively use Academia.edu, their motivations to use the site are different. These differences in user-motivations and user-activities across the disciplines are influenced by variations in the social and cultural practices of the disciplines. This study used Whitley's (2000) theory of degrees of mutual dependence and task uncertainty to explain the differences in the adoption and use of Academia.edu across the three disciplines.

Keywords: Academia.edu; academic social networking; ASN; scholarly communication; information behavior

I. Introduction

The most important role of a scholar is to produce new information by describing new data, concepts, and theories. These new data and theories become important and successful as they are communicated, comprehended,

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and verified by other scholars, providing new grounds for further research. Thus, communicability becomes a salient feature of a scientific, scholarly product (Garvey, 1979). Scholars communicate their ideas, research findings, and products to other scholars by various means, including conference proceedings, books, journal articles, personal and institutional web sites, and word-of-mouth.

Some of these, such as conference proceedings, books, and journal articles, are formal means of communication. Over 300 years ago scholars found that keeping track of current works by other scholars had become too burdensome and hard to handle by word-of-mouth and written letters. Therefore, in 1665, scientific papers began to be formalized and distributed by means of scientific journals. Since then, the number of scholarly journals has increased steadily and exponentially (Garvey, 1979). More recently, Mabe and Amin (2001) found that the growth of journals in certain disciplines is linear, with a 3.3% increase every year. Michels and Fu (2013) conducted a systemic analysis of coverage and usage of conference proceedings in Web of Science. They observed a varying growing rate of 3−18% between 2002 and 2009 (Michels & Fu, 2013). Bowker, a provider of bibliographic information management solutions, reported that print book output grew 6% in 2011 from 328,259 titles in 2010 to a projected 347,178 in 2011, which they believe is driven almost exclusively by a strong self-publishing market (2013). Scholarly journals, books, and proceedings serve to document the names associated with various discoveries, inventions, research studies, and theories.

In scholarly communication, informal communication plays an equally important role, if not more. Through informal communication researchers brainstorm creative ideas, express their thoughts, receive feedback on their research, and disseminate results. Derek J. de Solla Price discovered while doing bibliometric research that groups of elite scholars communicate among themselves through various informal means. He called such groups the "Invisible College" (Price, 1965) and emphasized the importance of their informal interpersonal communication to their work. Price further described the characteristics of invisible college as

> Device mechanisms for day-to-day communication. There is an elaborate apparatus for sending out not merely reprints of publications but preprints and pre-preprints of work in progress and results about to be achieved. In addition to the mailing of preprints, ways and means are being found for physical juxtaposition of the members … For each group there exists a sort of commuting circuit of institutions, research centers, and summer schools giving them an opportunity to meet piecemeal, so that over an interval of a few years everybody who is anybody has worked with everybody else in the same category. (pp. 84−85)

Though members of the invisible college distribute reprints of their published work as a form of formal communication, the discussions that take place among the members concerning published and unpublished materials are a form of informal communication. Such informal communications are essential for scholars to develop their thoughts and to raise issues that directly affect society. Scholars use informal communication to refine their initial research ideas and to gauge how important their research is to others. As Barjak (2006, p. 1352) writes, "Informal communication is not a pastime but serves to announce new knowledge, evaluate and refine it, and test its acceptance by fellow scientists." Barjak further defines informal scholarly communication as "communication taking place through discussions with close co-workers, talks, and reports to small colloquia, and working papers" (2006, p. 1352).

Now that information is widely available online, scholars use the Internet on a daily basis. According to Pew's Internet and American Life Project, 97% of participants who had post-college education use the Internet (Pew Research, 2014). Findings from a nation-wide survey of Internet use by US college faculty reported that out of 2316 US faculty who participated in the survey, 98% use the Internet to communicate with their students and 83% felt they spent less time in the library now that they have access to the Internet and online library services (Jones & Johnson-Yale, 2005). Evidently, with the invention of file sharing and online communication applications, scholars started communicating online. Informal communication thus remains an important means of communication for scholars and is now carried out through online communication applications in addition to traditional face-to-face and postal mail communication methods.

Different media, such as journals, books, conference proceedings, face-to-face media, e-mail, snail mail, online chat, telephone, online communication, and other file-sharing applications, offer different advantages and disadvantages for formal and informal communication. These advantages and disadvantages emphasize the fact that communication media affect the frequency of communication, content of communication, and consequences of communication among scholars (Wagner, 2008). Scholars choose to use communication media based on how often they want to communicate with other scholars, what they want to communicate with other scholars, and their expectations of the outcome of the communication (Wagner, 2008).

Wagner believes that even though the growth of the Internet and the evolution of online applications have allowed distributed collaboration such that scholars can now electronically communicate with other scholars across the globe, face-to-face meetings remain a critical starting point of many

projects (Wagner, 2008, p. 69). As Wagner states, it is "challenging for scholars to find a way to access the dynamic discussion and interaction—the social capital—that comes with working in a laboratory with other researchers" (2008, p. 77). Wagner says, "Researchers can tap into such discussions through electronic communications. But these mechanisms rarely capture the full range of information that is exchanged in casual, freewheeling face-to-face discussions, especially those involving many people" (2008, p. 77). Wagner believes that electronic communication does not allow the conveying of tacit knowledge—the intuitive experience that researchers may have and share spontaneously and subconsciously (Wagner, 2008). Thus, it is possible that the content communicated through asynchronous electronic communication may differ from the content discussed during face-to-face discussions. Also, there is a possibility that the expected consequences or outcomes of such electronic communication might be different from those of face-to-face communication.

II. Changing Nature of Scholarly Communication

In the past, most scholarly communication studies have been based on bibliometric analysis and webometrics where such methods were used to investigate formal means of scholarly communication by performing citation and link analyses on the references, citations, and hyperlinks available on published articles, books, and web sites.

Informal communication patterns have also been studied by researchers for many years. Previous studies have found that informal communication affects research productivity (Crawford, 1971; Lingwood, 1969; Paisley, 1972). As Crane and Rogers noted, informal communication allows the quick diffusion of ideas; scholars can clarify, ask, and discuss with experts with minimal wait time (Crane, 1972; Rogers, 1995). Pfaffenberger (1990) discovered that informal scholarly communication is more effective in sharing tacit knowledge. Researchers believe that informal scholarly communication forms a socio-technical interaction network in which communication is influenced by technology and at the same time defined by the social structures of scientists and their organizations (Kling, McKim, & King, 2003; Lamb, Sawyer, & Kling, 2000). These studies have explored behavioral patterns of communication, measured research productivity, and investigated the research collaboration of scientists communicating informally with others using certain communication platforms (e-mails, blogs, conference attendee listings, discussions on personal and group web sites, etc.).

Previous studies have focused on either informal or formal communication among researchers but rarely on both.

Academic social networking (ASN) sites, such as Academia.edu, are platforms where both informal and formal scholarly communication take place, creating a unique space for existing and emerging communication behaviors that have not been studied before. Moreover, the phenomenon of informal and formal scholarly communication taking place on social networking sites is new, and its impact on professional and research activities is less explored.

III. Academia.edu: An ASN Site

There are numerous web-based applications that scholars can use to communicate with others. The commonly used applications can be popular social networking sites, online reference sharing sites, and ASN sites. Academia.edu and ResearchGate are ASN sites in the sense that they focus on scholars (Thelwall & Kousha, 2014). They allow them to create academic and professional profiles, search for scholars by name, research interests, institutional affiliation, and disciplinary background, and view networks of other scholars. These sites allow scholars to create profiles, view lists of connections made by others, and connect with other scholars with similar research interests and institutional or disciplinary affiliations. Unlike LinkedIn, ASN sites allow scholars to share their scholarly work, initiate and participate in scholarly discussions, and obtain user-analytics. A scholar who uses Academia.edu can use the application to view the network of other scholars and see who is following whom. Recently, Mendeley (www.mendeley.com) expanded its service and became a reference manager and an academic social network site.

Academia.edu, launched in 2008, "… is a platform for academics to share research papers. The company's mission is to accelerate the world's research. Scholars use Academia.edu to share their research, monitor analytics around the impact of their research, and track the research of fellow scholars they follow" (Academia.edu, 2012). Academia.edu is one of the largest and most used ASN sites. According to a survey conducted by the Centre for Research Communications, 17% of the 117 respondents indicated having an awareness of the site, making it the second most popular social networking site used by researchers (2011). In November 2013, Alexa.com gave Academia.edu a Global Rank of 2164, ResearchGate was ranked 3828, and Mendeley was ranked 25,447. Global Rank on Alexa.com indicates the estimate of the site's popularity which is calculated using

a combination of average daily visitors to a particular site and pageviews on the site over the past 3 months (www.alexa.com). The site with the highest combination of visitors and pageviews is ranked #1 (www.alexa.com).

IV. Challenges in Studying ASN Sites

The features of ASN sites are very similar to mainstream social networking sites such as Facebook and MySpace. As such one would assume that study designs, survey instruments, and interview questions used to study communication behaviors of users of mainstream social networking sites can also be used to study user behaviors of ASN sites. In fact, that is not true. There are some challenges to designing studies that focus on understanding the communication behaviors, user-motivations, and user-perceptions of scholars using ASN sites. First, the decision to adopt a technology by scholars is affected by the social, political, and cultural milieu of their disciplines, their departments, and the institutions they are affiliated with. Second, their motivations for using ASN sites are different from the motivations of users who use mainstream social networking sites. Studies on the differences between the use of Facebook by faculty and students showed that faculty generally do not use the social networking site for educational purposes (Mazer, Murphy, & Simonds, 2007; Roblyer, McDaniel, Webb, Herman, & Witty, 2010), although some scholars sometimes use it to announce new articles on profile pages (Kortelainen & Katvala, 2012; Priem, Groth, & Taraborelli, 2012). Third, considering ASN sites are fairly new medium of scholarly communication, there is a lack of available literature and instruments established to measure communication behaviors of scholars on ASN sites.

A. Use of Whitley's Theory

Whitley's (2000) theory has been very popular in Science and Technology Studies (STS) dedicated to scientific knowledge and technology in its social context. For example, Fry (2006) used Whitley's theory to study information practices in three academic fields: High-Energy Physics, Social-Cultural Geography, and Corpus-Based Linguistics. Fry aimed to identify the interrelationship between the traditions of informal and formal scientific communication within a discipline and how that interrelationship shapes digital outcomes across intellectual fields. Fry and Talja (2007) also used Whitley's theory as a framework for their study, investigating disciplinary

differences in the production, relevance, and use of academic mailing lists, scholarly home pages, and scholar-produced decentralized digital resources.

Whitley provides an analytical framework for comparing scientific fields as particular kinds of organizations, reputational work organizations, and providing reasons for their similarities and differences. Whitley's theory recognizes that the social context within a discipline varies by field and provides a single explanatory framework in understanding the epistemological and social contexts that may influence the information practices and the adoption of information technology within a discipline.

According to Whitley, "Differences in the patterns of intellectual and social development of academic fields can be characterized in terms of two dimensions: *the degree of mutual dependence* between researchers in making competent and significant contributions and *the degree of task uncertainty* in producing and evaluating knowledge claims" (p. 85). The degree of mutual dependence refers to "scientists' dependence upon particular groups of colleagues to make competent contributions to collective intellectual goals and acquire prestigious reputations which lead to material rewards" (p. 87). An increasing degree of mutual dependence implies that the scientists rely more on their colleagues for reputation and access to resources. This means they comply with particular standards of competence and particular criteria of significance to their reputations and the recognition of their contributions.

There are two different aspects to the degree of mutual dependence: *the degree of functional dependence* and *the degree of strategic dependence*. The degree of functional dependence between the members of the field refers to "the extent to which researchers have to use the specific results, ideas, and procedures of fellow specialists in order to construct knowledge claims which are regarded as competent and useful contributions" (Whitley, 2000, p. 88). Thus, the degree of functional dependence refers to the need to coordinate task outcomes and demonstrate adherence to common competence standards. The degree of strategic dependence is the "extent to which researchers have to persuade colleagues of the significance and importance of their problem and approach to obtain a high reputation from them" (p. 88). Thus, degree of strategic dependence refers to the necessity of coordinating research strategies and convincing colleagues of the centrality of particular concerns to collective goals.

The second dimension of patterns of intellectual and social development of academic fields is called *the degree of task uncertainty*. Degree of task uncertainty refers to "variations in the extent to which work procedures, problem definitions, and theoretical goals are shared between practitioners, and are clearly articulated" (p. 119). Whitley suggests that task uncertainty is

important because of the varying degree of novelty of results in the sciences and the ease with which results can be fitted into existing knowledge.

There are two different aspects to the degree of task uncertainty: *the degree of technical task uncertainty* and *the degree of strategic task uncertainty*. The degree of technical task uncertainty refers to "the extent to which work techniques are well understood and produce reliable results in various scientific fields" (p. 121). Lower task uncertainty implies that there is a well-established set of research techniques that can be acquired through formal training programs, and research results will be more predictable, visible, and replicable when those research techniques are used. The degree of strategic task uncertainty encompasses uncertainty about intellectual priorities, the significance of research topics and preferred ways of tackling them, the likely reputational pay-off of different research strategies, and the relevance of task outcomes for collective intellectual goals. An increase in the degree of strategic uncertainty is associated with greater theoretical diversity, reduction in the degree of central control over research goals, and increasing local autonomy in the formulation of strategies and significance standards.

Whitley's theory is beneficial for understanding information practices within a discipline because it offers insights into how and why epistemic and social dimensions covary with each other (Fry & Talja, 2007). In other words, the theory integrates both the social and the epistemic considerations of scholarly fields into a single explanatory framework (Fry, 2006). To achieve this, Whitley argues, first, that social context within a discipline varies by field. For instance, Biology, Chemistry, and Physics, all within the discipline of Science, have varying social and epistemological contexts. Second, Whitley characterizes differences across disciplines in terms of the degree of mutual dependence in making competent and significant contributions and the degree of task uncertainty in producing and evaluating knowledge claims and task uncertainty.

Whitley believes that information creation practices within a specific culture of an intellectual field depends on a variety of factors: the relative degree of reputational control over competence, significance standards, and descriptive concepts (which influences the adoption and use of technology by individuals in a given field); plurality and diversity of audience; the visibility, uniformity, and stability of task outcomes; degree of theoretical diversity; and the degree of central control over research goals. As Fry (2004) suggested, Whitley's theory accounts for how the disciplines are organized according to influences generated both internally and externally to scholarly communities and provides a comparative framework within which disparate descriptions and theories of disciplinary usage of digital resources and networks can be organized and coordinated.

Thus, Whitley's theory provides a single explanatory framework in understanding the social context within a discipline that influences the information practices and the adoption of information technology within a discipline. As such, it was used for this case study to develop knowledge of the social environments of Physics, Linguistics, and Sociology that influence the adoption and use of ASN sites in the three disciplines.

V. Case Study

In order to understand scholars' behaviors on ASN sites, a case study was undertaken to explore the communication behaviors and user-motivations of scholars in Physics, Linguistics, and Sociology using Academia.edu, and the impact of their use of Academia.edu on their professional activities. These three disciplines were selected because they are culturally diverse and are good representations of three different degrees of interdependence levels—mono-disciplinary, multidisciplinary, and interdisciplinary fields. The study explored the following questions:

- Who uses Academia.edu?
- When do users from the three disciplines use Academia.edu?
- What do users from the three disciplines use Academia.edu for?
- What are the user-perceptions of the impact of ASN sites on their professional activities?

Data were collected using three instruments: Academia.edu server log, survey, and interview. The server log data consisted of 7030 users from Physics, 5211 from Linguistics, and 8068 from Sociology that were used for further analysis. The 20,309 users studied from these three disciplines were grouped into the following seven categories: Alumnus (939), Department Member (1603), Faculty Member (5557), Graduate Student (8438), Post-Doc (1085), Retired (188), Undergraduate Student (2499) (see Fig. 1).

A total of 267 complete surveys came from respondents in the three selected disciplines as follows: Physics (62), Linguistics (104), and Sociology (101). These 267 survey respondents were grouped as follows: Graduate Student (96), Post-Doc (20), Untenured Professor (48), Tenured Professor (44), Research Scientist (25), Retired (10), and Practitioner (24) (see Fig. 2).

There are some differences in the categories for Professional Status in the server log data and survey data. The categories in the service log data were predefined by Academia.edu. For instance, in the server log file, Faculty Member constituted both untenured and tenured professors in the United States and in Canada. However, in the survey questionnaire,

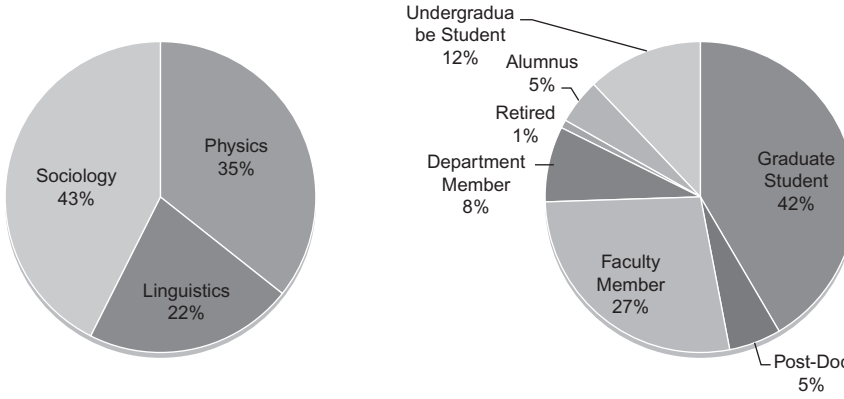

Fig. 1 Sample distribution from the server log data by discipline and professional status.

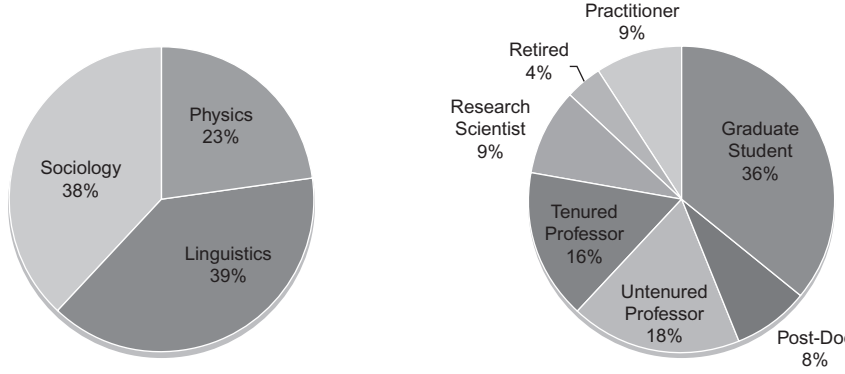

Fig. 2 Sample distribution from the survey data by discipline and professional status.

participants were asked to choose from the subgroups of Faculty Members, that is, Tenured Professor and Untenured Professor. This is because the study intended to capture the communication activities, user-motivation, and perceived impact of ASN sites on professional activities at a subcategorical level. The decision was made based on the assumption that untenured professors will be using ASN sites more than tenured professors in order to increase the visibility of their portfolios as this may help them in becoming tenured professors. Additionally, Academia.edu allows users to select

Department Member and Alumnus if they want to be grouped as part of the same department or institution on the site. These categories of Department Member and Alumnus were irrelevant for the survey questionnaire because it was an anonymous survey where department and institution names were not collected. In addition, the Professional Status categories such as Faculty Member and Department Member in the server log file were redundant. In the survey questionnaire, the Professional Status called Other was subcategorized under Research Scientist and Practitioner in order to get a deeper understanding of the behaviors of 18% of the survey participants. The server log category, Undergraduate student was not included in the survey questionnaire data because no responses were received from an undergraduate student.

There were a total of 28 interview participants. Out of the 28 participants, 8 were from Physics, 10 were from Linguistics, and 10 were from Sociology. Frequency of monthly user-login from the server log data was analyzed by discipline and professional status (Alumnus, Department Member, Faculty Member, Graduate Student, Post-Doc, Retired, and Undergraduate Student). Descriptive analysis was conducted on participants' survey responses. For this study, the best approach was to conduct semi-structured interviews and perform a comparative analysis. This method involved asking open-ended questions and engaging in informal conversation with participants, allowing exploration of political and social dynamics among researchers, their disciplinary structure, and standards that affect their research activities. Each comment was coded and organized under themes and concepts.

A. Variations in the Degree of Mutual Dependence and Task Uncertainty across the Three Disciplines

This study shed light on the degrees of mutual dependence and task uncertainty in Physics, Linguistics, and Sociology. Based on the analyses of server log data, survey data, and interview transcripts, Physics exhibited a high degree of mutual dependence and low degree of task uncertainty. Linguistics is a discipline with low degree of mutual dependence and high degree of task uncertainty, whereas Sociology has moderate degree of mutual dependence and medium to low degree of task uncertainty. The analysis of interview transcripts elucidated the cultural practices of the disciplines. Interview transcripts were analyzed based on these characteristics of degrees of mutual dependence and task uncertainty (see Table 1). It showed that Physics has a high functional and strategic mutual dependence, and low technical and strategic task uncertainties. On the other hand, Linguistics represents a discipline with low functional and strategic mutual

Table 1
Degree of Mutual Dependence and Task Uncertainty in the Three Disciplines

	Physics	Linguistics	Sociology
Functional mutual dependence			
1. Specialization of research topic	High	Low	Low
2. Standardization of research techniques	High	Low	High
3. Coordination of research outcomes	High	Low	High
Strategic mutual dependence			
1. Coordination of research strategy	High	Low	High
2. Convincing colleagues of the centrality of particular concern	High	Low	Medium−high
3. Diversity of audience for intellectual products	High	Low	Medium−high
Technical task uncertainty			
1. Contingencies in research techniques	Low	High	Low−medium
2. Contingencies in task outcomes	Low	High	Low
3. Variability in reporting research outcomes	Low	High	Low−medium
Strategic task uncertainty			
1. Lack of hierarchical ordering of problems and goals	Low	High	Low−medium
2. Considerable degree of theoretical pluralism	Low	High	Low−medium
3. Limited centralization of control over significance standards	Low	High	Low

dependence, and high technical and strategic task uncertainties. Sociology is an interesting discipline where there is a moderate degree of mutual dependence and task uncertainty. In this discipline research techniques are standardized and well-established, emphasizing the fact that there is significant control over the centralization of research methods by groups of elite scholars in various subfields of Sociology. Such a fairly centralized research system will have a formalized reporting system and preferred communication channels agreed upon by the elites. Consequently, there is less variability in the reporting systems and communication channels of the subdisciplines. Sociologists want to establish reputation of their work in their field of study and therefore, are compelled to follow the standardized research techniques, reporting systems, and communication channels known to the elites of the subdiscipline. However, considering studies in Sociology involve human social behavior and its origin and development in society, researchers have the freedom to pursue diverse research problems and topics, exhibiting a moderate degree of mutual dependence.

B. Who Uses Academia.edu?

An analysis of the server log data showed that the majority of users logging into Academia.edu are graduate students followed by faculty and department members. However, further analysis of the server log data showed that post docs and Faculty Members have the highest numbers of logins on Academia.edu within the 10-month period, making them the most frequent users of the site followed by Department Members (see Fig. 3). This is an interesting phenomenon where a large number of graduate students register on Academia.edu but do not login into the site as frequently as post docs and faculty members. The question then is: Do graduate students have certain expectations of Academia.edu and find that those expectations are not met? If the answer is that their expectations are not being met that could explain why they do not login to the site as often as post doc and faculty members. Further study is required to understand this phenomenon.

In general, physicists use Academia.edu less often than linguists and sociologists. This difference in the use of Academia.edu across the three disciplines can be explained by the cultural practices defined by Whitley's theory and the supporting evidence from server log data, survey questionnaire, and interviews. In Physics, research objectives are stable and are often evaluated by a small community of experts within the field. Researchers seek feedback from experts in the field from the conception of the idea until the final reporting stage. They have a small audience for intellectual products and rely upon particular groups of colleagues for peer-review, reputations, and access of resources. Also, there are specific communication channels that

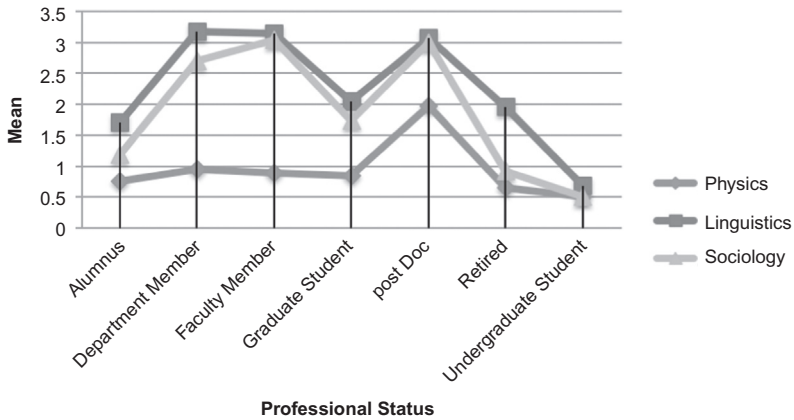

Fig. 3 User-login by discipline and professional status.

they use to communicate with their colleagues such as Arxiv.org, face-to-face meetings, telephone, e-mail, Skype, and Google+. In other words, Physics is a discipline with a high degree of functional and strategic dependence, wherein there is a relatively high degree of control over research topic and task outcome, work procedures, communication channels, reporting system, and audience. As a result, Academia.edu is not a preferred communication platform for physicists because less diversity of research topics compels them to depend on and communicate with specific groups of audiences through well-established communication channels. Fry (2006) also observed the same phenomenon and concluded that physics being a community with a high degree of mutual dependence coupled with a low degree of task uncertainty are adept at coordinating and controlling channels. Among the eight participants interviewed in Physics with diverse professional status, all eight interviewees mentioned that they registered with Academia.edu because they received e-mails from the CEO of Academia.edu and therefore wanted to explore the site to satisfy their curiosity. Two of the participants said they also heard about the ASN site at an annual conference for Physics Education and wanted to explore the site. Another interviewee affiliated with Physics Education said, "I use it as a substitute for my personal website which is on my university domain. In that way if I leave my current job, I still have all the information on the web." The same interviewee said, "Physics Education is not very competitive as Physics itself. I am a physicist but Physics Education is more of an Education degree. My research is also part of Physics."

Linguistics is multidisciplinary in nature and therefore research objectives are diverse, topics are conceived in different ways, and theoretical pluralism is common. Results of research cannot be discerned easily, and are subject to conflicting interpretations. In most subfields of Linguistics, there is huge diversity in the audiences of the intellectual products. Emphasizing the diversity of studies in this discipline, a linguist said during the interview, "Often times, in studies related to indigenous languages, there are only one or two researchers working on any particular language. So, I am the only researcher who is working on this tribal language in New Zealand." Consequently, linguists share their scholarly work through various communication channels including ASN sites because it increases the chance of meeting another researcher with similar research interests.

Also, unlike Physics, there is no specific group or audience that linguists rely on for peer-evaluation, building reputation, and coordination of research strategies. Because of the diversity in research topics and research methodologies, linguists sometimes do not have access to elite individuals or groups in the discipline to seek approval on their research approach. As

one of the linguists who were interviewed said, "[In Linguistics] no methodologies are as well established. It depends on the type of questions you are asking and the particular theoretical framework you are working with … Often it is the case that you work solo on one particular project but sometimes when you get older and become an expert, you take grad students and take some of your work and start working with your community." Usually, graduate students and early career researchers in Linguistics closely work with their advisors and/or research collaborators in order to verify and seek approval on their research topics and techniques. In other words, even though there is some degree of strategic dependence exhibited in graduate student and dissertation/thesis advisers, and early career researchers and faculty mentors, this is a discipline with low mutual dependence. As a result, researchers not only share their research with other linguists through diverse communication channels such as ASN sites, personal homepage, journals, monographs, conference presentations, and personal communication, but they also share with "lay audiences" for building reputation. Fry and Talja (2007) found that Linguistics is the community with the most unrestricted communication system among the studied disciplines because it relies on public visibility and accountability.

Sociology is a discipline where there is diversity in research problems and topics but there is less diversity in audience/readers of intellectual products. Sociologists are involved in a variety of research problems that require collaboration with other disciplines and subdisciplines such as cultural criminology, environmental politics, medical sociology, labor relations, and comparative historical sociology, to name a few. However, there is considerable consensus on research techniques, coordination among collaborators, and evaluation of task outcomes within small groups of researchers in order to avoid deviant formulations, methodologies, and results. Thus, there is medium to high degree of mutual dependence between sociologists. Such a moderate degree of mutual dependence influences the communication channels sociologists use and the reasons they use them. Unlike linguists, sociologists use ASN sites not to reach the diverse audience from other disciplines, but to have their academic works and professional accomplishments visible to a wider audience in their community for reputational enhancement. As one of the interviewees said, "I would discuss it [my work] with colleagues in my institute or other institutions or with others in my academic circle because I can be more assured that they will be more invested in my success." According to Whitley's theory, Sociology is a discipline that exhibits moderately high functional dependence and depends on significance and importance of their research work for overall goal and priorities. In such a disciplinary culture, researchers do not rely on specific

works of particular researchers in making their contributions to collective goals, but compete over the relevance of those contributions to such collective goals and intellectual priorities of the field (Whitley, 2000). For this reason, sociologists use ASN sites such as Academia.edu to make their professional work available to a wide audience within their community in hopes that reputations will be awarded to them for the relevance of their work to the collective goal. As one of the sociologists who were interviewed said, "I would say 70% of people I follow I know in real life and the rest I don't know but I want them to know me." This practice of using ASN sites to establish reputation in the community was echoed by all the sociologists who participated in the interviews.

C. When Do Users Use Academia.edu?

Server log data indicated the number of times users of Academia.edu logged in within the 10-month period (July 2011—April 2012). An analysis of the data showed a similarity in the trend of user login across Physics, Linguistics, and Sociology (see Fig. 4). User-logins are markedly lower in July, December, and April. User-logins increased in frequency in August and January. With the majority of users of Academia.edu affiliated with universities and colleges, these increases could be attributed to the cyclic nature of the academy as also demonstrated by other related trends. User-logins increased during the academic semesters and decreased toward the end of those two semesters. Also, users do not login to Academia.edu as frequently during the end-of-year holiday season.

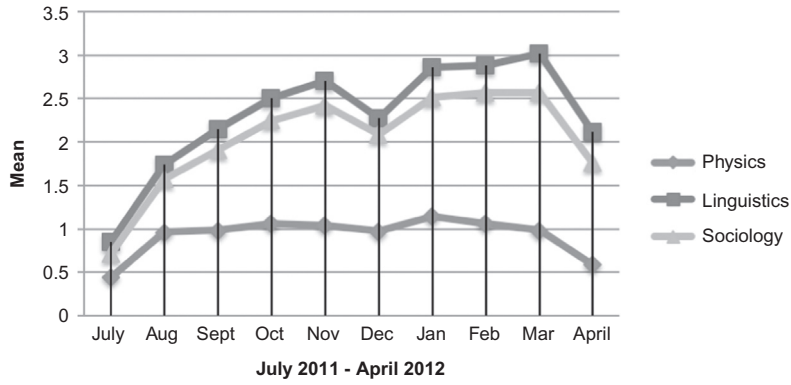

Fig. 4 Monthly user-login by discipline.

D. What Is Academia.edu Used for?

Results from the survey showed that users of Academia.edu from Physics, Linguistics, and Sociology often use the site to update their profile information, to post their research articles/papers, to read articles posted by others, and to search for researchers with similar research interests. However, in general physicists use Academia.edu less often than linguists and sociologists. Three quarters of the interview participants from Physics said they decided to register on Academia.edu after receiving e-mails from the CEO of Academia.edu just to see what it was.

Although linguists and sociologists use Academia.edu to update their profile information, for physicists who were interviewed, maintaining a profile on ASN sites such as Academia.edu is not a priority. Physics being a discipline with high mutual dependence has a well-established community that reviews each other's work based on established research techniques, competency standards, established control over task outcomes, and a strict outcomes reporting system. Physicists are a part of a very tightly knit community where scholars come to know each other through personal references, publications, postings on Arxiv.org, and listings of members distributed by the American Physical Society. Only one out of eight interviewees said, "I use it [Academia.edu] as a substitute for my personal website which is on my university domain. In that way if I leave my current job, I still have all the information on the web." This interviewee is affiliated with physics education, which according to the interviewee, is culturally closer to teacher education as a discipline.

Results from server log and survey data showed that linguists actively maintain their profile information on Academia.edu. A total of 10 linguists were interviewed, of which 6 were graduate students, 2 were post docs, and 2 were untenured professors. All graduate students and post doc interviewees said that they are often encouraged by their advisors, mentors, and colleagues to have a web presence for the purpose of employment. This is because in Linguistics, researchers pursue research with diverse and differential goals. Consequently, there are a large number of small groups of experts working on particular topics. As shown in the analyses of the user-motivation section of the survey and results from the interview, there are two main reasons for having an increased web presence: first, to find researchers with common research interests from a large pool of researchers with varied goals, and second, to advertise one's portfolio for employment. Where there is low mutual dependence and high task uncertainty, there is a high degree of fluidity in their research priorities and research strategies, researchers tend to establish local control of their work procedures and

reputations by increasing the visibility of their scholarly work to a wider audience using informal networks. Such is the case in Linguistics. Crane (1972) found that where there is an increasing degree of technical task uncertainty, researchers have control over work procedures locally through informal networks. This assertion was supported by the linguists who were interviewed who indicated that online profiles such as in Academia.edu were informal ways of communicating their competence and research work to others. Alluding to this disciplinary culture, a linguist said, "I was told that it is good to have portfolios online because then more people will know me and my work. And I can find a job."

Like linguists, sociologists regularly update their profile information. A total of 10 sociologists were interviewed, of which 6 were untenured professors, 2 were post docs, and 2 were tenured professors. All untenured and post docs said that it is important for them to keep their profile information updated for others who are interested in getting information about them. Analyses of server log data showed that post doc, and department and faculty members more frequently update their profile than scholars with other professional statuses. They also think that their profile should reflect current information because when a researcher's name is searched on Google.com, Academia.edu profile is among the top links on the search result.

Although both linguists and sociologists maintain updated profile information on Academia.edu, individuals from the two disciplines do so for different reasons. Sociologists keep an updated profile with an intention to increase their visibility/popularity within their subfields and beyond. Sociology exhibits moderate technical task uncertainty, meaning there are distinct sets of disciplinary research methods including field characterization of its domain, its problems, and descriptive language that differentiate competent research from amateur contributions. But research topics are on various social issues, and therefore subject to lay pressures and legitimization criteria (Whitley, 2000). Consequently, sociologists not only rely on validation of their research work from disciplinary experts but also reach out to individuals outside of their domain in order to establish the importance of their work in society. Popularity of a sociologist among lay individuals of the society can have a positive influence on his/her reputation within the discipline and its subdisciplines. Thus, use of varied communication channels to popularize their research work is a common strategy used among researchers in Sociology.

1. To Post and Read Research Articles/Papers

Physics is a discipline that has a low degree of task uncertainty, meaning, there is "considerable predictability, stability, and visibility of task

outcomes. Research problems and goals are fairly clearly ordered, restricted, and stable" (Whitley, 2000, p. 124). The low degree of task uncertainty is also indicative of the fact that there is high mutual dependence, wherein, scholars are highly dependent on fellow colleagues for formulation and organization of research work, and validation of research techniques and outcomes. In physics, experts within the field establish reporting systems, languages, and the style of writing, compelling researchers to use specific terminologies, formats, graphs, and symbols understood by all members of the field. According to Whitley's theory (2000), when technical terms dominate the communication system and lay concepts are excluded, there exists a high degree of reputational control exerted by powerful scientific groups within the field. As a result, scholars in their early career are akin to using communication channels where their scholarly work are read by reputable leaders of the field. In other words, disciplines with low degree of task uncertainty and high mutual dependence compel researchers to use communication channels that are established and controlled by leaders of the field. Such is the case in Physics, where physicists post their research articles/papers on Arxiv.org and present them at annual conferences for physicists. This is also evident from the results from server log data and survey data where physicists had significantly fewer numbers of papers, news, and books posted, as compared with linguists and sociologists.

In Linguistics and Sociology, researchers are attracted to posting publications on ASN sites such as Academia.edu because of the versatility of these platforms. Academia.edu can be used to disseminate publications of varied format and view user-analytics. Linguists and sociologists are motivated to use Academia.edu because it allows them to share information and monitor the popularity of their scholarly works among audiences. Peer-reviewed journals and books are formal publications that can be searched in various library databases. However, for years scholars were unable to access publications of other formats that carry valuable information. Many scholars used personal home pages in hopes that others will come across their scholarly work serendipitously while searching information on a search engine. Nowadays, ASN sites can systematically distribute such publications to relevant communities. Interview participants believed Academia.edu provides a platform for posting peer-reviewed, as well as non-peer-reviewed publications such as PowerPoint presentations, draft papers, preprints, blogs, home pages, and conference proceedings.

Linguists and sociologists believed that ASN sites have the potential to enhance the ability of scholars to disseminate their scholarly works. Academia.edu supports dissemination of scholarly works by sending notifications of new postings of papers, news, and books to all users with similar research interests via e-mail. Admiring this feature of Academia.edu,

a linguist said, "Academia.edu always tells me when new papers are posted in my field," alluding to the fact that when he/she posts papers, news, or books, fellow scholars are alerted to his/her posting.

Academia.edu produces user-analytics that tells users how many times papers and profile information have been viewed in a month. This user-analytic feature of Academia.edu allows users to track the growth of the popularity of their profile and research work in a larger community. It also assures them that others view papers posted by them on Academia.edu. An interview participant said, "There are particular linguistics listservs where a lot of journal publishers post messages about new articles but I am not sure people actually read those messages. I know people on Academia.edu do." Survey results also confirmed that users, especially by graduate students, post docs, and untenured professors, read papers posted on Academia.edu.

According to the responses from the interview participants, users post their research articles/papers with the intention to promote their scholarship and to become more visible in their community. One of the interview participants from Sociology said that she likes the fact that, "if you are on Academia.edu, you show up on Google." Thus, users of Academia.edu are motivated to use it because it makes them more visible on Google.com, a widely used search engine. In addition, Academia.edu increases the visibility of scholars by actively making their work visible to a larger community by notifying users of new posting. This was also evident from the survey results where Sociologists and Linguists believed that Academia.edu could potentially increase visibility/popularity of scholars in their field of study. Results from the server log data showed that faculty members, department members, and post docs actively post papers, news, and books on Academia.edu followed by graduate students, alumni, retired, and undergraduate students. Graduate students do not actively post papers, news, and books because they are training to be scholars and have not produced enough scholarly materials. Also, according to the interview participants in Sociology, graduate students and early career scholars prefer not to post unpolished work on a public domain to prevent reputational damage.

2. To Connect with Other Researchers

Academia.edu is widely used by researchers in Linguistics and Sociology to search for researchers with similar research interests. Results from the survey showed that physicists use Academia.edu less frequently to find researchers in their field, as compared with linguists and sociologists. This was also evident from the results of server log data where physicists had a significantly lower number of followers than linguists and sociologists. Responses from

interview participants indicated that physicists tend to search and follow researchers they know, in the process checking out the novelty of the site, as opposed to sociologists and linguists who try to connect with others they do not know but have similar research interests. On the other hand, linguists and sociologists use ASN sites with an intention to connect with scholars they do not necessarily know but are familiar with their work and research interests. Linguists and sociologists are motivated to use ASN sites to develop interconnectedness by meeting new researchers. Interview participants expressed similar motivations as well. A linguist said, "On Facebook and LinkedIn, I try to follow people I usually know personally, but on Academia.edu, I follow people I don't know." Similarly, a sociologist said, "[on Academia.edu] I do not necessarily know people personally but I follow them for similar interest."

Linguists and sociologists value connecting with researchers outside of their home institution and workplace. This is evident from the responses received through the survey results where linguists and sociologists thought that ASN sites could potentially enhance their ability to contact colleagues outside of their home institution. However, the motivation behind connecting with individuals outside of their institution may differ across the two disciplines. In Linguistics, where there is low mutual dependence and high task uncertainty, loosely bounded groups pursue diverse and differential research topics. In such a disciplinary culture, certain research topics are so unique that there are no existing literature and research procedures available to refer to. As one of the linguists said during an interview, "My research is on an indigenous language from New Zealand spoken by this tribe of a thousand individuals. To my knowledge, I am the only researcher working with that tribe." As a result, linguists use ASN sites, in hopes that they will meet with someone with interests that closely match theirs. When asked about linguists having fear of sharing research ideas in these public domain because of the possibility of work being plagiarized by others, a linguist said that there is no such fear in Linguistics because studies in Linguistics are not time sensitive, and research topics are often unique and studied by small number of individuals or groups. According to the interviewee, it is crucial to post preprints and materials from research in progress on ASN sites to build a community of researchers working on similar, if not the same topic.

Sociology is a discipline with low task uncertainty and a moderate mutual dependence. This means even though research topics are diverse, there is certainty about intellectual priorities and standards of research techniques controlled by elites of subfields of Sociology. They have established publications and conferences where studies are published and through which researchers come to know each other and their scholarly

contributions. As a result, unlike in Linguistics, researchers in Sociology do not use ASN sites to form a community with similar interests. Instead, they use ASN sites to connect with researchers from other disciplines. As one of the sociologists said during the interview, "… we need to collaborate with other disciplines because the nature of our research involves people in various settings such as schools, parks, etc." Another sociologist who is a tenured faculty member at a university said, "My university does not have a graduate degree in Sociology, so I do not have graduate students to work with. I use it to connect to a younger generation of scholars to see the research trend."

3. To Stay Abreast of News and Developments

Both Sociology and Linguistics are disciplines that require collaborating with researchers from other disciplines. Linguistics is multidisciplinary in nature. Although there are some established research techniques in certain subdisciplines such as in Syntax and Semantics, scholars in Linguistics borrow methodologies and tools from other disciplines. Attesting to this fact, one of the linguists said during the interview, "Methodologies are constantly changing and are not well established and receive a lot of input from Psychology, Sociology, and Anthropology."

Researchers in Sociology study social issues that require them to collaborate with other disciplines, not for research techniques, but to gain access to various social settings and people involved in those settings. For instance, a sociologist who participated in the interview said that his research work is in the field of Medical Sociology and it requires him to collaborate with doctors and nurses to gain access to the setting where he can recruit research participants, gain access to classified information, as well as hold discussions with health professionals on social aspects of patient care.

ASN sites such as Academia.edu are scholarly platforms that are open to scholars from various fields. News on events and conferences are posted on Academia.edu by individuals and through paid advertisements. Not all universities have all disciplines and not all scholars have the luxury of time and resources to read publications, learn about events and conferences from other disciplines, and attend those conferences, especially graduate students. Survey results showed both graduate students and professors use ASN sites to stay abreast of new developments in their field and in other relevant disciplines, but graduate students use Academia.edu more for this purpose than professors. Thus, ASN sites are widely used to learn about the latest developments, conferences, and events in disciplines outside of their own field of research.

E. Users Perceptions of the Impact of ASN Sites

Unlike physicists, scholars from Linguistics and Sociology believe that ASN sites such as Academia.edu can be beneficial in enhancing their ability to contact colleagues outside of their home institutions, enhance their ability to stay abreast of new development in their field of interests, enhance their ability to disseminate their scholarly works, and increase their visibility or popularity in their field.

Scholars from all three disciplines benefit from expanding their network of connections with others who can potentially be of help in advancing their scholarly work and career. However, physicists do not find ASN sites helpful in this regard. Instead they use other medium such as ArXiv.org and directories produced by the American Physical Association to find other scholars and use e-mail, telephone, and Skype to contact those researchers. This is because in Physics, the elite members of the discipline control the communication media and structure. And physicists are more reliant upon media that are used by the elite members. According to Whitley's theory, this is a common phenomenon in disciplines with high degree of mutual dependence and low task uncertainty. Physicists need to disseminate their scholarly work to the elite members for review and recognition, which will help in the advancement of their scholarly career. Therefore, it is reasonable for physicists to use communication media that is popular among the elites of the discipline. As such, ASN sites such as Academia.edu can only become popular among users physicists if the elite members of Physics use them.

Linguists find Academia.edu and such ASN platforms beneficial in many ways. Linguistics is a discipline with low task uncertainty in that it has varied research topics and research techniques. There are many experts in many different subtopics in this large discipline. Consequently, linguists prefer to disseminate their work widely through many different communication channels, in order to increase their chances to meet experts in their field of interest. Academia.edu is a platform that caters to such distribution needs of scholars by allowing them to post their papers and automatically notifying fellow scholars with same research interests via e-mails. Linguists also perceive this feature of Academia.edu helpful in distributing their curriculum vitae and publicizing their profile for employment purposes. Linguists collaborate with individuals and organizations from all over the world as experts of smaller subdisciplines of Linguistics are scattered widely across the globe. Scholars find fellow scholars with relevant interest by browsing scholars by discipline or browsing the networks of followers on Academica.edu. As such linguists find ASN sites able to support bringing scholars together.

Sociology is a discipline with moderate mutual dependence; it exhibits diversity in research topics in diverse social contexts. Sociologists need to network with people from other fields in order to have access to human and information resources, as well as access to the social environment relevant to their research topics. ASN sites are open to scholars of all disciplines and are used by millions of scholars from various countries and institutions, with diverse research interests. Consequently, ASN sites can be resourceful for sociologists in order to expand their network that can potentially help them have access to human and information resources for their research studies. Moreover, such sites are also beneficial to them in disseminating their CVs and scholarly work to audiences from all disciplines and professional statuses, potentially increasing their popularity within and outside of their subdisciplines. Interview participants from both Linguistics and Sociology expressed a desire to network with seasoned scholars from their disciplines, and stated that Academia.edu currently does not have many established scholars registered on the site.

More than Tenured Professors, graduate students believe that ASN sites can increase the quality of their scholarly work, enhance their ability to stay abreast with new developments, and enhance their ability to get information on conferences and scholarly events. Perhaps this is because tenured professors have well-developed networks and sources of information about conferences and scholarly events, as opposed to graduate students who are in the process of becoming scholars. Tenured Professors usually have expertise in certain research areas and pursue resources that help them stay informed about the development in their particular field of research, whereas graduate students are still at a stage of exploring new developments in various research topics, in order to determine which research topics they want to pursue.

VI. Conclusion

ASN sites are on the rise and are widely used by scholars from various disciplines. These sites, however, are not adopted and used uniformly across disciplines. Wagner (2008) claimed that the medium of communication has an effect on the frequency, contents, and consequences of scholarly communication. In contrast, this study showed that scholars' behavior and activities are defined by disciplinary cultures that influence adoption and use of technology. This study was valuable as it set out to explore the communication behaviors of researchers in different disciplines, their motivations for using ASN sites, and the perceived benefits of using ASN sites on their

professional, intellectual activities. Based on available published material, such a study has never been pursued before. As such, the results are valuable for librarians and other information professionals who liaise with scholars from academic disciplines in disseminating and promoting their research. It is important for Scholarly Communications and Outreach librarians, and subject liaisons to know that not all ASN sites are suitable for all disciplines. Prior to suggesting an ASN site, librarians should gain a good knowledge of the cultural and social environments of the disciplines within a particular institution and in general. They should make an effort to understand the cultural aspects of a discipline they are liaising with by gathering information pertaining to the diversity of research topics, contingencies in research techniques, coordination of research outcomes, diversity in audience for intellectual products, degree of centralization of control over significance standards, and information on already established communication channels including listserv, ASN sites, directories, conferences. Knowledge of such cultural aspects can help librarians determine which ASN sites are suitable for a discipline/subdiscipline, and how to strategically introduce them to the members of a discipline.

This study has a number of limitations. These limitations are: 1. While the three disciplines, Physics, Linguistics, and Sociology are good representations of three different degrees of interdependence levels—monodisciplinary, multidisciplinary, and interdisciplinary fields, interviews from the study reveal that in certain disciplines, there may be variations in the subdisciplinary culture. These variations could be in types of research priorities, research methodologies, diversity in audience, reporting systems, and communication channels. 2. This study was limited to the research activity and communication patterns exhibited by researchers in Physics, Linguistics, and Sociology of Academia.edu and there are slight differences in the features offered by different ASN sites that may influence the communication behaviors of scholars. 3. Server log data provided by Academia.edu for this study was limited to a certain time period (July 2011−April 2012). ASN sites are quite dynamic and this imposes another limitation to this research.

This study cannot be generalized; however it is still important because the results are transferable to future online scholarly communication studies, particularly the ones that involve ASN sites. Web-based applications for scholarly communication are constantly evolving, disciplinary norms are changing, and so are the communication patterns of scholars on these platforms. It is believed that future studies with disciplines other than Physics, Linguistics, and Sociology will make the results more robust. Also, replication of this study on a different ASN platform will shed light on the

differences in communication patterns and user-motivations of scholars as influenced by features of an ASN platform.

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Appendix A: Interview Guide

1. What is your age group?
   20–30
   30–40
   40–50
   50–60
   60 and above
2. What is the highest academic degree you have earned?
   Associate
   Bachelors
   Masters
   Doctorate
   Others (specify)
3. What type of institution you are currently affiliated with?
   2-year college
   4-year college
   Research Institute
   Government Organization
   Industry Lab
   Others (specify)
4. What is your currently professional status?
   Graduate Student
   Post Doc
   Untenured Professor
   Tenured Professor
   Retired
   Other (specify)
5. Please tell me about your educational background? What are your undergraduate and graduate degrees on?
6. Are there specific subfields of your discipline that your research activities or interests are related to? If so, please name the subfields. For example, if your field of research/professional activities is Physics, subfields would be Geophysics, Astrophysics, Medical Physics, Biophysics, etc.
7. Does your research activity frequently involve theoretical analysis, lab experiments, field research, or a mixture of them?
8. Does your research activity involve collaboration with other researchers? If so, do you collaborate with researchers from your discipline or other disciplines?
9. Literature indicates that researchers use different communication media at different stages of their research project. What communication media do you us at various stages of your research project? Examples of communication media could be conference, workshops, academic journals, telephone, e-mail, academic social networking sites, face-to-face interaction, etc.
10. Why do you use Academia.edu and/or other academic social networking sites?
11. In general, do scholars in your department collaborate with others? If so, do they collaborate at a domestic or institutional level?
12. Does your institution value coauthored publications or single author publications?
13. Does your institution encourage scholars to use academic social networking sites such as Academia.edu? If so, why?

Appendix B: Survey Questions

Q1 What is your gender? 1. Male 2. Female
Q2 What is your age (in years)?
Q3 What is the highest academic degree you have earned? (Indicate one choice)
- ☐Associate
- ☐Bachelors
- ☐Masters
- ☐Doctorate
- ☐Other (specify)

Q4 What type of institution you are currently affiliated with?
- ☐2-year college
- ☐4-year college/University
- ☐Research Institute
- ☐Government Institution
- ☐Industry Lab
- ☐Other (specify)

Q5 What is your current professional status?
- ☐Graduate Student
- ☐Post-Doc
- ☐Untenured Professor
- ☐Tenured Professor
- ☐Retired
- ☐Other (specify)

Q6 Indicate the discipline that most closely identifies the area in which you conduct the majority of your research/teaching/product development.
- ☐Physics
- ☐Linguistics
- ☐Sociology

Q7 How frequently do you use Academia.edu to do the following activities? (Relative frequency was determined by the response to a 5-point Likert scale with 1 = not at all, 2 = rarely, 3 = sometimes, 4 = often, 5 = all the time.)
Q7a To communicate with others
Q7b To update my profile information
Q7c To post my research articles/papers
Q7d To read comments on my research and publications
Q7e To post comments
Q7f To read articles posted by others
Q7g To search researchers with similar interests
Q8 For each item, indicate the relative amount of benefit you have gained by using ASN sites such as Academia.edu on a 5-point scale where 1 = No benefit and 5 = Major benefit.

Q8a	Enhance your ability to contact with colleagues at your home institution/ workplace
Q8b	Enhance your ability to contact with colleagues outside of your home institution/workplace
Q8c	Enhance your ability to collaborate with colleagues
Q8d	Enhance the quality of your scholarly work
Q8e	Enhance your ability to stay abreast of new development in your field
Q8f	Enhance your ability to get information on conferences and scholarly events
Q8g	Enhance your job performance
Q8h	Enhance your ability to disseminate my scholarly work
Q8i	Increase my visibility/popularity in my discipline

The Scholars' Commons: Redefining Services and Spaces for Graduate Student Success

Michael Perini[a] and Beth Roszkowski[b]
[a]Fenwick Library, George Mason University, Fairfax, VA, USA
[b]Arlington Campus Library, George Mason University, Arlington, VA, USA

Abstract

Undergraduate information commons have become pervasive in the academic library landscape. In recent years, librarians and administrators have come to identify the need for comparable commons' spaces and services for graduate students. This chapter serves as a review of recently developed models of graduate commons—in this discussion referred to as Scholars' Commons—as defined by an integration of physical learning spaces, personnel, and a dynamic availability of research support services that support assist graduate students throughout their academic life cycle. These provisions serve as the foundation for the development of enhanced library-supported graduate student success.

Still a rare commodity, existing models from selected institutional web sites were examined using a framework for analysis consisting of several criteria: new use of space; segmented services; partnerships; and new organizational structures. Through a synthesis of the commonalities prevalent in these systems, this chapter aims to provide recommendations for prospective Scholars' Commons models and proposals for their development. Library organizations contemplating the development of a Scholars' Commons need to consider the needs of their target population, potential new or reallocated spaces, feasibility of providing support and research technologies, and possible staffing models. As well, the authors consider the importance of library-based graduate student support that bolsters cross-divisional collaborative partnerships across the academy.

Keywords: Graduate commons; academic libraries; graduate student support; library support services

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I. Introduction

While the concept of a graduate student-focused Commons is relatively new, research on the components of library commons, namely unified services and spaces supporting scholarship, targeting other user populations are quite prevalent. Information or Learning Commons, as they are often called, were conceived to serve primarily undergraduates in physical spaces where "technology, service, and atmosphere [were combined] to create a dynamic, comfortable, and collaborative educational environment" (Whitchurch, 2010, p. 41). Within the Information Commons model, academic trends in collaboration and cooperative learning are supported by the physical configuration of a Commons' space, complete with movable furniture, productivity software, and high tech computing access (MacWhinnie, 2003). Finally, the digital component of a Commons—online resources, assistance, and services unified in one site—complement the physical Commons space and consolidate services and resources into an "integrated digital environment" for users (Beagle, 1999, p. 82). This model has been widely embraced by academic libraries since the 1990s and according to Colvin (2010) has evolved over time to include cafés, presentation spaces, performance and exhibit areas, in addition to collaborative spaces, technology access, and user support services, equipping the libraries to address to a variety of user needs.

As undergraduate Information Commons have become pervasive in the academic library landscape, librarians and administrators in recent years have come to identify the need for comparable Commons' spaces and services for graduate students. The needs of graduate students change throughout their academic life cycle as they transition from student to teacher to researcher to author, and new graduate Commons attempt to address these accompanying life cycle needs through a variety of spaces, services, and technology. They are often conceived and marketed as a unified physical space, frequently complimented by a virtual presence. Additionally, the very nature of scholarly work is changing with the onset of new technologies, digital scholarship, and increasingly interdisciplinary research. Libraries poised to respond to and support the needs of graduate students in this new research environment will be well positioned to foster and become active partners in productive scholarship.

The study reported in this chapter serves as a review of recently developed models of graduate commons—from here on referred to as Scholars' Commons—in three prominent academic institutions in the United States, defined by an emphasis on physical learning spaces, library personnel staffing configurations, and a dynamic availability of research support services. These shared provisions may well serve as a foundation to enhanced

library-supported graduate student success. Through a synthesis of the commonalities prevalent in these systems, this chapter explores prospective characteristics for Scholars' Commons models, argues for Scholars' Commons as an opportunity for libraries to increase graduate student professional preparation, and provides discussion of needed future research.

This chapter will begin with a review of literature regarding student and faculty usage of the library and offer reasoning for research on and implementation of a graduate student-oriented Scholars' Commons. The discussion will then provide a survey of existing models identified by the authors that display unified structural, service, and personnel criteria. An evaluation of the features and offerings of current models will be provided, followed by a discussion highlighting some of the considerations libraries should reflect upon prior to the implementation of a Scholars' Commons.

II. Literature Review

Academic institutions recognize that learning spaces should encourage active and collaborative learning, generate opportunities for both formal and informal work, and provide gathering places for students and faculty. Significant research exists on library-as-place and on library usage for both of undergraduate and faculty populations (Armatas & Vincent, 2011; Barratt & White, 2010; Beagle, 2012; Leather & Marinho, 2009). Similar studies have also been undertaken on undergraduate student use of library space as a place to learn outside of the formal classroom and as a physical location for studies, social interaction, group work, and access to informational resources (Head, 2007; Taylor, 2010; Walton, 2006). Most notably, many libraries have created Information, Student or Learning Commons to support this activity (Bailey & Tierney, 2008; Dewey, 2008; Ritchie & Ray, 2008; Stuart, 2009; Wong, 2009). From the perspective of libraries and their physical domains, Information or Learning Commons have become the standard-bearer for dedicated undergraduate spaces in academic libraries since the 1990s (Colvin, 2010; Whitchurch, 2010).

Conversely, faculty utilizes the library primarily for the acquisition of materials and only occasionally as space for research labors (Marcus, Covert-Vail, & Mandel, 2007). Faculty members also utilize more specialized research support services, such as scholarly communication and open access publication assistance, than do other library user populations (Courtois & Turtle, 2008; Malenfant, 2010; Mischo & Schlembach, 2011). Faculty also use Institutional Repositories (IRs) (Jantz & Wilson, 2008), although their actual usage is mixed according to Lercher (2008).

In general, faculty purport to support library initiatives aimed at enhancing both student and faculty scholarship, but it appears to be in a hands-off, service-oriented manner. For example, Yang's (2000) study found that a vast majority of faculty value library services, but that only a fraction utilized their liaisons for instruction and found faculties' greatest use of the library was ordering books or serials for their own use. Essentially, research has shown that faculty members like and seemingly appreciate the services provided by libraries, but many of them do not spend significant time in libraries nor do they wish to partner with libraries to initiate or develop new services. Therefore, library spaces and services intended for faculty, as a patron population, may be ineffective. Given this, it may be more worthwhile for libraries to target a routinely underserviced population for collaborative service and scholarship opportunities: graduate students.

Within the field literature on graduate and/or doctoral education, many studies exist that address curriculum design (Fong, 2012; Moore, Dilmore, & Robinson, 2011), program planning (Gardner, 2010; Rasanen & Korpiaho, 2011), and even competencies within the programs that pertain to aspects of student professionalism such as publishing and conference presentation (Arrellano & Martinez, 2009). In addition, research has examined the efficacy of program-internal learning methods, such as journal groups and comprehensive reading lists, and their benefits to students as emerging scholars within their respective disciplines (Golde, 2007). Ideally, graduates of masters or doctoral programs should emerge as scholars "who will creatively generate new knowledge, critically conserve valuable and useful ideas, and responsibly transform those understandings through writing, teaching and application" (Golde & Walker, 2006, p. 5).

However, according to Foote (2010) "there is … a mismatch between the implicit knowledge and skills needed to succeed in an academic career and the topics explicitly in graduate curricula, advising and mentoring" (p. 11). Large-scale research studies (Golde & Dore, 2001) examining the publishing trends of graduate students, demonstrate the absence of such preparatory training in this aspect of academic professionalism. Additionally, there are also micro-level discussions that inspect the difficulties with the professional academic productivity of graduate students. Shelby and Okilwa (2011), for example, found that the challenges navigating the professional processes were compounded since "many graduate programs are not structured to facilitate student publication" (p. 2). Regardless of study size, findings suggest that graduate students discover that the professionalism process is multifaceted and complicated when not adequately developed or supported by academic programs.

Missing from these analyses concerning graduate student professionalism is the integrative and active role of the academic librarians and libraries

in the process of preparing graduate students for life in academia. For example, studies exist discussing graduate student productivity external to the library (Barrick, Easterly III, & Rieger, 2011; Martínez, Floyd, & Erichsen, 2011) and publishing support services for graduate students at the library (Richard, Koufogiannakis, & Ryan, 2009). Unfortunately there do not currently exist any analyses examining the value of combining both initiatives and their collaborative outcomes. Therefore, graduate student Commons may provide libraries and librarians with opportunities to support graduate students as they prepare for and transition to professional academic life, to market complementary services in a unified fashion, for scholarly collaboration with graduate students, and to study the impact of such collaborations on graduate student professionalism and growth.

Commons engineered to support graduate students, often called Research Commons or Scholars' Commons, which provide services and spaces tailored to the unique needs of graduate students, are a recent development in academic libraries which aim to address students' professional support needs. The multiple roles graduate students play throughout their academic life cycles—student, teacher, researcher, writer/author, archivist, and job hunter—present libraries with significant research and service opportunities (Covert-Vail & Collard, 2012), given the examined mismatch between academic program curricula and the skills needed to succeed in academia postgraduation. Forward-thinking institutions have recognized that as graduate students progress through their programs and their academic life cycles, their needs change significantly, and hence many libraries have developed a suite of services to address these different needs. The Scholars' Commons model allows libraries to consolidate these oftentimes already existing support services and research spaces into a "one-stop-shopping" location (Rempel & Davidson, 2008), which often address the service gaps that academic departments cannot address programmatically on their own. Scholars' Commons initiatives include copyright assistance, publication and presentation preparation, grant writing, research assistance, data management support, author rights consultations, scholarly communications programming, data services support, and digital scholarship, often in conjunction with other campus units (Rempel, Hussong-Christian, & Mellinger, 2011; University of Virginia, 2008). Some Commons even provide long-term work spaces for students as departmental offices are rarely available for those without research or teaching assistantships. In essence, a Commons space can provide these students with "a collaborative environment in which students and faculty can come together to share and discuss research, as well as get support for all steps of the research process: searching, writing, publishing, funding" (University of Washington, 2013).

Many of these Scholars' Commons are newly established, and assessment of student usage, satisfaction, and professional preparation outcomes in conjunction with the newly created spaces is ongoing. The usefulness of many of these innovations must be analyzed in the future so that graduate Commons designs and approaches can continue to develop and evolve to benefit future graduate student populations.

III. Benefits of a Scholars' Commons

Scholars' Commons, with their offerings of services aimed at the various stages of graduate student life cycles, are well-poised to be an essential bridge for graduate students as they transition from student to professional academic. In essence, the Scholars' Commons links the preparation of professionalism, traditionally tied to academic departments, to the library. This is a mutually beneficial opportunity for libraries, students, and faculty.

A vital function of the academic unit is graduate student outcomes as they relate to professionalism and to sustaining a particular field of study. "At the practical level, career preparation is vital to sustaining and improving [a discipline's] position in higher education" (Monk, Foote, & Schlemper, 2011, p. 1433). However, many academic departments are unable to provide systematic, programmatic professional development support to all of their graduate students due to lack of funding, programming space, or faculty/staff involvement. As discussed earlier, through the Scholars' Commons model, professional academic preparation can come directly from librarians and libraries. Although many faculty members believe incoming graduate students are fully prepared to conduct scholarly research, student knowledge gaps certainly exist, and libraries can assist students with their advanced scholarly pursuits through services such as data management, literature review, or statistical analysis assistance when departments cannot provide comprehensive support (Rempel & Davidson, 2008). As Golde (2007) noted, "changing a [graduate] program is not easy" (p. 350), especially with regard to programs or departmental cultures. This is especially true when proposing innovative service opportunities that meet neglected student needs and come from a vantage point peripheral to the academic department or college in question, as is the case with libraries. However, systemic librarian integration with graduate students at a point-of-need basis can engender the development of partnerships for the advancement of students' academic professionalism and facilitate greater knowledge sharing, leading to improved future library services and student outcomes.

Now is an opportune time for this effort, as the function of the academic librarian has shifted appreciably in the recent years (Goetsch, 2008), and academic libraries are increasingly viewed as service-oriented organizations as opposed to mere repositories of materials (Jeevan, 2007). In the past, academic librarians have been viewed as a form of quasi-faculty who may struggle for parity in their academic institutions (ACRL, 2012), thereby hindering their ability to collaborate with scholars. However, by addressing the gaps in graduate student professionalism education, librarians are poised to take a more active role in student outcomes. Additionally, advancing technology has resulted in the accessibility of more advanced research tools for librarians to utilize (Cardina & Wicks, 2004). The changing functions of academic librarians, along with the changing nature of scholarship due to technological advancements, have created an exceptional opportunity for the field. As Wolfe, Naylor, and Drueke (2010) assert, "reference librarians are perfectly positioned to collaborate with other stakeholders …[as] they operate in integrated virtual and physical worlds, where the human and the computer work together" (p. 110). With this shift in librarians' roles, there is now the potential to alter perceptions as librarians work within the framework of the Scholars' Commons and become vital to burgeoning graduate student professionalism.

IV. Selection of Current Models

At the inception of this study, the researchers identified Scholars' Commons using three criteria: unified physical spaces, staffing, and the services offered therein, targeted to graduate students. These initial definitions established boundaries for analysis of existing commons models and were instrumental in identifying and evaluating current incarnations. The original survey of existing Scholars' Commons began in the summer of 2013 with a review of the library web sites of George Mason University's Institutional Research and Reporting Board's list of peer institutions (George Mason University, n.d.). From these 26 schools, it was found that only one, Florida State University (FSU), met the selected criteria. Another institution, the University of Massachusetts Amherst, does offer a "one-stop-stopping" Commons experience, but their Learning Commons is marketed toward undergraduates, although graduate students are not discouraged from utilizing the Commons.

In order to gather a larger sample size, the study consequently was expanded through literature and web site reviews to identify other large-scale public and private institutions outside of the peer group that had existing or imminently launched Commons features and spaces; 13

Table 1
Final Commons Model Selection

Institution	Parent unit	Commons name
University of Washington (UW)	Allen Library	Research Commons
Florida State University (FSU)	Robert Manning Strozier Library	Scholars Commons
New York University (NYU)	Bobst Library	Research Commons

additional schools were examined. Surprisingly, while many schools offer individual services and facilities that may be incorporated into a Commons, such as statistical analysis or rooms for dissertation writers, there were few institutions that marketed Commons in a complete, defined form. In total, 39 institutions were examined, and only three institutions with active Commons were identified; a fourth school, Indiana University, was actively preparing to launch a Commons but had not yet done so. Final model selections can be viewed in Table 1.

The vast majority of the information about these Commons was gleaned from the institutions' respective web sites, although staff and administrators were contacted when basic structural clarification was required. Outlined characteristics of the Commons are found in Table 2.

Covert-Vail and Collard (2012) offer a more structured, refined framework through which to consider offerings at a Scholars' Commons. Considering the prospective offerings that a research library might provide graduate students, both generally and within a Commons space, Covert-Vail and Collard organize their recommendations into four categories: *new use of space*; *segmented services*; *partnerships*; and *new organizational structures*. The authors used this framework since it highlights new features for model design and practiced considerations for the implementation of a future Scholars' Commons.

Using these refined parameters, three institutions were analyzed.

V. Findings

A. New Use of Space

Covert-Vail and Collard (2012) state that "the growing need for collaboration—particularly across disciplines—and for services from

Table 2
Summary of Scholars' Commons Characteristics

Staffing and management	Hardware and software	Programming and services	Academic unit collaborators	Spaces
Librarians Library Staff Student workers Internally hired manager Externally hired manager Team management	Data software: SPSS, Stata, R, NVivo GIS software Text analysis software Ipads Poster printing	Research support: drop-in sessions, office hours, 1-on-1 consultations Book clubs Scholarly communications support: author rights, copyright assistance Grant writing workshops Data analysis & statistical support Writing help	Academic Units Graduate schools Writing Center Information Technology department Dean of Information Technology Center for Faculty development Graduate student services	Quiet study Collaborative study Comfortable seating White boards/white board paint Reading rooms Dissertation Writers' Room Computer labs Presentation spaces Café space Multimedia labs Research materials storage space

multiple library or campus providers leads to new use of library space" (p. 5). The increasingly interdisciplinary nature of research and the changing role of the library as a place to promote graduate professionalism dictate the need for new use of space within libraries. Space availability and usage directly influences what services can be provided, what partnerships can be developed, and how staff may need to be reorganized. For this reason, space is the foundation upon which a Scholars' Commons might be built.

Dedicated physical space, as might be expected, was a commonality within all of the surveyed Scholars' Commons. The differences in institutional facilities are primarily manifested in the size and scope of the actual spaces. New York University's (NYU) Research Commons, which opened in 2010, featured a variety of open, collaborative study spaces as well as quiet, limited access "writer's rooms" suitable for individual study (New York University, 2013). Other physical considerations by NYU included comfort of the common area seating and sensory concerns such as acoustics and lighting.

Access to open areas generally conformed to the hours of the host library. Some spaces, such as the NYU Dissertation Writers' Room, have restricted access, even for graduate students; access may be obtained by special request, lottery, or swipe card. Other spaces are open and accessible to all patrons. It should also be noted that while many of the Commons' reviewed here are aimed at graduate students, several of them do not forbid nor explicitly restrict undergraduate students from open areas within the Commons.

B. Segmented Services

As previously intimated, space design influences the services that can be provided. Covert-Vail and Collard (2012) suggest that the multiplicities of graduate students create different service needs depending on a variety of factors. These influences "include demographic pressures; resource inequality among academic departments, programs, and even the terminal degree sought; the academic life cycle; and the consequent multiple roles graduate students occupy" (p. 5). Thus results the need for and development of segmented services for graduate students.

The most basic of these services are technological. Software is plentiful at many Commons. NYU makes many statistical, qualitative, and GIS analytical tools available to students, such as SPSS, SAS, STATA, Qualtrics, Matlab, and others. It also has a Digital Lab that provides access to Final Cut Studio, Compressor, Adobe, Audacity, Logic 9, and more (Collard, personal communication, August 15, 2013). Similar offerings were proffered at FSU; the Research Commons at UW focuses more on making technologies, as opposed to software, available to students: camcorders, plasma screens,

projectors, etc. The great variability in student demographics presents libraries with challenges with regards to access (of both the space and services) and potential outreach opportunities. Offering instruction at a variety of graduate student-friendly hours, such as in the evening or on weekends to meet the needs of part-time students seems standard as does giving access cards to restricted spaces such as those at NYU. When determining segmented services for students, the academic life cycle is perhaps the most significant consideration. In theory, a fifth-year doctoral student planning for a tenure-track career in academe should have a better understanding of publication processes than a first-year master's student. As a result, the services offered to students must address variations of student needs across their programmatic years as well as their fields of study.

The University of Washington's (UW) Commons offers a Design Help Desk that caters to early-stage graduate students looking to improve visual presentation and publication skills. That Commons also offers specific middle-stage graduate student aid through grant and scholarship acquisition workshops and late-stage help in the form of dissertation writing service (University of Washington, 2013). The diversity of services also predicates the possibilities of collaborations through partnerships with the campus community, such as Career Services or Information Technology.

C. Partnerships

Partnerships with external departments—both academic and administrative units—can contribute significantly to the functionality of the Scholars' Commons since they demonstrate the collaborative means by which the system might succeed operatively. Covert-Vail and Collard (2012) affirm that "libraries are leveraging their partnerships with academic and administrative units across campus to enhance the quality and efficacy of graduate-focused services and spaces" (p. 5). Surveyed commons' established partnerships varied greatly by school, both in terms of institutional organization and support as well as the technologies they offered. NYU's Commons is supported by various existing, internal library units such as Business and Gov Docs, Science and Health, and Data Services sections, as well as General Reference (Collard, personal communication, August 1, 2013). Individual coordinators manage each section and meet regularly to organize Commons' scheduling and services. In contrast, services that are administrated externally to the libraries also flourish in a Scholars' Commons. FSU's Commons uses its space for events hosted by the Library, in conjunction with other units, and for events hosted or managed by other campus entities, such as "book discussion groups, guest lectures, faculty symposia and graduate research fairs" (Florida State University, 2013).

Other units that work in partnership with the Research Commons at FSU are the Office of Faculty Recognition, Center for Humanities & Society, and Office of Graduate Fellowship and Awards (Colvin, 2010). Here, an assortment of campus units collaborate in order to best support student learning. What is notable about Commons design with regard to partnerships is that most libraries, including those that do not feature a unified graduate Commons, offer some or all of these technologies and unit-specific services. The vast majority of libraries differ from the few schools discussed here because they do not as yet conceptualize their services as part of an academic life cycle-focused Scholars' Commons, or at the very least do not market their services as a collective, one-stop-shopping entity.

D. New Organizational Structures

New organizational structures may emerge due to the partnerships and services provided in the new spaces, as well as through staff reorganization. As Covert-Vail and Collard point out, "research libraries will need to cultivate and recruit for the new roles, relationships, and expertise needed to provide for dynamically evolving graduate student needs" (p. 5). First, the physical space might differ from previous services areas. A new reference or information desk might be added—or an old one taken away! Decisions about the staffing of service points must be made, particularly the hours of availability, the personnel levels (librarian, staff, or student), and the department from which personnel are drawn. If technology is upgraded, staff must be trained to accommodate questions about it. Some services might require additional staff specialties (event planning for example) or might require supplemental, temporary staffing.

In the surveyed models, staffing levels varied by institution and were linked directly to the services provided at each. Prior to the debut of their Commons, NYU librarians were significantly retrained in preparation for operating in a unified space to ensure that students were given appropriate referrals to Commons services. Later, new positions were added to the staff to accommodate growth in the Commons' (Collard, personal communication, August 1, 2013). New position might entail a Commons Coordinator, staff to man information desks, or technical support personnel to assist with complex hardware and software. As of 2013, FSU runs their Commons with seven librarians and four support staff members (Florida State University, 2013). In contrast, UW operates with two librarians, one staff member and three graduate research assistants.

In addition, hours of staff accessibility vary according to intuition. At FSU, for example, librarians were available from 8:00 a.m. to 5:00 p.m. or

by appointment, although students can access the Commons area whenever the Strozier Library (its host) is open (Florida State University, 2013). This practice is likely in use in many academic libraries—both those with and without a Commons. In general, libraries implementing a Commons will have to ensure that staffing patterns correspond with demand depending on the physical space and the services provided.

Table 3 provides the overall results of the narrative findings.

From these data, it became apparent that for institutions planning a Commons, major preliminary considerations concern projected user needs as well as usage and marketing to the targeted audiences. Should a school focus on graduate students alone or a mix of graduate students and faculty? All

Table 3
Commons Models' Characteristics by Institution

Institution	FSU	NYU	UW
Established	2008	2010	2010
Physical area	1st floor of Strozier Library	4th and 5th floor of Bobst Library	1st floor of Allen South Library
Spaces	Open reading room, group study rooms, conference rooms, instruction room, computer labs	Space for individual study and group work, collaborative technology rooms, limited access "writers' rooms," computer labs, quiet reading rooms, individual study rooms, Digital Lab	Space for individual study and group work, collaborative technology booths and collaborative screen spaces, presentation spaces, Grants and Funding Information Services Office
Access	Some rooms require key access or reservations	Some rooms require swipe card access or reservations	Some spaces and rooms require reservations
Services	Data services, research consultations with librarians, book discussions, workshops, symposia	Data services, digital projects assistance, research consultations with librarians	Research consultations with graduate students, workshops, grant writing programming, themed talks, symposia, writing assistance

Table 3 (*Continued*)

Institution	FSU	NYU	UW
Technology	SPSS, SAS, Stata, Matlab, NVivo, media view equipment, white board paint, projector	SPSS, SAS, Stata, R, ESRI GIS products, Qualtrics, Matlab, Final Cut Studio, compressor, Adobe CSS, Lynda.com, Pro Tools, Logic 9, Soundtrack Pro, Audacity, Garage Band, white boards, LCD screens	Plasma screens, camcorders, projectors, white boards, no computers in the space
Leadership	Head, Scholars Commons	Four Librarian Coordinators	Research Commons Librarian
Partnering units	Office of Faculty Recognition, Center for Humanities and Society, Office of Graduate Fellowship and Awards & Testing, Graduate School	Information Technology	Information Technology, Graduate School, Writing Center

students? What services do students need? Additionally, economic considerations are plentiful. Technology and individuals properly trained to operate and maintain specialized hardware and software can be quite costly. Therefore, what services, and accordingly what staffing, are required (or needed) to operate a Scholar's Commons at an optimal level? The following section discusses the implications of these issues.

VI. Discussion

One of the most notable conclusions drawn from this study of selected Scholars' Commons is that a great number of the services provided are already operating in unconnected capacities at many academic libraries, but they have yet to be conceptualized and marketed as a cohesive Commons that can fully

address a broad range of graduate student needs. This begs the questions of library organizational revision, both review and redesign of a library's internal organizational relationships as well as identification and partnering with non-library entities within the larger institution for the benefit of the academic community. Internally, libraries can reorganize spaces and services through a reassessment of their physical and human resources, as evidenced by NYU's Commons development. There, a cohesive suite of services, within a unified space, offers libraries a supremely marketable entity, thereby reducing individual librarians' outreach burden in favor of advertising the Commons as a "one-stop-shop" for student research and support needs.

A. New Use of Space

As mentioned previously, Scholars' Commons provide advanced students with dedicated research and work space that academic departments may be hard pressed to provide for both master's and PhD students. Additionally, throughout academia, there is a growing need for systems and services that allow users to interact "in increasingly complex ways with digital resources—including data, images, text, and video" that Scholars' Commons aim to address (Covert-Vail & Collard, 2012, p. 12). To some readers, this aspect of the Scholar's Commons model might bring to mind Digital Humanities (DH) spaces since some of their programmatic offerings and purposes overlap. In order to expound upon new and existing research, DH digitizes the methodologies of the humanities disciplines and has gained significant traction in the field during the past 15−20 years (Sula, 2013). The authors believe that DH spaces and personnel focus on the implementation of digital tools in order to supplement or maximize research project potential while the purpose of a Scholars' Commons is broader. DH is just one component of the kind of activity that might take place in a multidisciplinary Commons space. For example, the Scholars' Commons might provide a student with assistance in utilizing GIS software to create maps related to historical texts. This might also take place in a DH space, but in a Commons a student would also receive guidance on author rights and publishing the resulting maps. A DH requires a significant amount of specialized staff, hardware, and software in order to operate successfully. If a library can unify spaces and services for graduate students and either create new or reallocate old spaces for dedicated graduate study, such as with UW's computer-free Research Commons the basic components of the Scholars' Commons are achievable, whereas DH operations often need endowment or grant funding to develop and operate their specialized digitized offerings.

B. Segmented Services

Several of the Commons, such as UW's version, market themselves as providing services to both graduate students and faculty. However, the authors believe this may not be the most advantageous use of library resources and outreach efforts. As the literature suggests, the majority of faculty generally use the library simply for the acquisition of materials while their utilization of other library services and resources is much more mixed. Therefore, if faculty study spaces are provided within a library but few use them, then limited library space is put to poor use. Library services marketed to faculty might meet the same fate.

Covert-Vail and Collard (2012) also note that the heavy growth in master's programs in recent years may result in information inequalities for master's students: "graduate student services and support may have been initially configured for doctoral populations … master's program may be effectively sealed off from the rest of the academic department, considered standalone, and therefore not receive information about resources and services that the library provides" (p. 7). With this in mind, it is important for libraries to assess the needs of all of their graduate students, both master's and doctoral, and craft and curate services that meet the academic life cycle needs of both of these graduate student bodies. Additionally, having a singular, marketable entity like a Scholars' Commons may reduce the individual student burden of seeking out services, especially for the "sealed off" students Covert-Vail and Collard reference.

From a fiscal standpoint, it may behoove library administrators to focus material and personnel resources toward the patrons who show a higher percentage of usage, whether that be all graduate students, PhD students, master's students, or faculty. Individual libraries should be prepared to collect and analyze assessment data on their patrons' needs in order to make informed, strategic service decisions about which audiences to target for Scholars' Commons spaces and services. This might appear as counterintuitive to many whom view libraries as a common good which serves all patrons, but it actually demonstrates a more focused approach to marketing and outreach according to Buchholz (2009).

C. Partnerships

With respect to scholastic collaboration with academic and other campus units, the areas where librarian—faculty collaboration have shown promise, according to Kennedy and Monty (2011), can be extended to graduate students within the Commons model. For example, some of the services offered

by the UW's Research Commons in support of faculty, such as grant management software and research support, could directly support the possibility of student—librarian interaction. A passive service role for librarians when students merely seek help to find research material is not suggested here. Instead, a working, collaborative relationship is envisioned wherein both student and librarian benefit by producing scholarly works and the professional skills of graduate students can be developed.

For example, FSU's Scholars Commons hosts research fairs, lectures, and symposia (Florida State University, 2013), activities that are essentially localized opportunities for graduate students to explore their professional possibilities. In this manner, the Scholars' Commons is able to provide graduate students with the opportunity to partner with the library to produce scholarship while navigating current and future professional academic expectations. The Commons provides a physical place which enables this type of collaboration to occur, while also increases the chance for students to discover new, useful services and resources that comprise a "one-stop-shopping" space. The marketing of a Commons in this way increases the potential for augmented, successful outreach from the librarian perspective and encourages a different and altered cultural approach to graduate student education and professionalism.

Another consideration during the design phase of a Commons is that the collaborative partnerships between librarians and other units on campus that provide services in the Commons must be strategically devised. Research advocates for the proliferation of partnerships across academic divisions (Carrillo, 2012; Janke, Kelley, & Soliman, 2013; Real, 2012), but point out that obstacles to full and total cooperation between units persist. Lester (2011) asks "Why are there so few partnerships between student [services] and academic affairs? There is no single answer; rather, we must acknowledge that organizational life in higher education pulls us apart rather than together" (p. 80). There are no distinct, defined reasons that can be pinpointed to explain the proclivity for units to look inward when designing innovative services. In developing a Scholars' Commons, external partnerships with academic units would warrant when deciding the scope of services to be provided.

Part of the reason for failed or stalled partnerships has to do with the real or perceived cultural silos that are manifest on campuses. "Cultural differences between the divisions, as well as the real and perceived differences in the deeply held values and beliefs about students and their education, hamper the pursuit of cross-divisional partnership" (Arcelus, 2011, p. 64). Essentially, instructional faculty likely considers their role in the education of students to be more relevant to the students' complete learning outcomes

than those offered by external units, including those offered by the library. In addition, practical inhibitors to collaborative services may persist. For instance, if a writing center mainly serves undergraduates, then collaboration with a graduate student-focused Scholars' Commons may be unsuccessful for both units. Furthermore, units with different missions that agree to jointly offer advanced software, technology, and communications support may fail unless they have clearly defined shared goals from the outset. Also if the relative goals of an academic department do not mesh with the aims of a Scholars' Commons, a direct partnership may not make sense.

In hopes of addressing these kinds of roadblocks to student success, Arcelus (2011) suggests that "institutions should dissolve the deeply entrenched division of labor between faculty (attending to students' intellectual development) and student [services] (focusing on students' social and emotional development), acknowledging … [that] intellectual development does not happen exclusively in the class and social and emotional development does not happen exclusively out of class" (p. 63). Without suggesting the primacy of classroom-based or extracurricular learning, many studies have demonstrated the validity of both arenas of education (Qualters, 2010; Strachan & Owens, 2011; Ullman, 2010). In essence, learning is ubiquitous and transcends the existence of academic departmental silos. Clearly, such impediments must be weighed carefully prior to building a Scholars' Commons. Is the implementation of a Scholars' Commons practical within the internal organization of the library? Are there external opportunities for collaboration? Is collaboration a realistic solution to providing services? Library directors and administrators must address these variables in order to design a viable and sustainable space that truly will benefit graduate students as scholars.

D. New Organizational Structures

Another issue pertains to the organizational leadership of a Scholars' Commons. As noted, the Scholars' Commons models examined here either used existing staff in the Commons or they hired new staff to direct and coordinate its activities. There are two options for Scholars' Commons leadership that emerge: one, librarians and two, academicians.

Both librarians and nonlibrarian staff can serve in organizational roles for Scholars' Commons, though librarians held the main leadership positions at the institutions surveyed. For example, the four major organizational components of NYU's Commons—Business and Government Documents, Science and Health, Data Services, and General Reference—are led and coordinated by librarians. As responsibilities increased, additional nonlibrarian support staff were added (Collard, personal communication,

August 15, 2013). FSU's Scholars Commons is headed by a librarian, with additional librarians and three staff members in support (Florida State University, 2014). Similarly, the UW's Commons has a lead librarian and an assistant librarian aided by one staff member and three graduate student assistants (University of Washington, n.d.).

However, there are extant examples of nonlibrarians serving in leadership roles in library departments. In 2011, McMaster University Librarian Jeff Trzeciak stated that it would endeavor to hire only subject-specific PhDs and IT specialists throughout the McMaster system (Dupuis, 2011). For a comparable illustration to the Commons model, the University of Virginia's Adler Library features the Scholar's Lab, which is a DH enterprise at heart, but shares attributes with the Scholars' Commons studied herein in terms of research scope and outreach. The director of that particular library organization, Dr. Bethany Nowviskie, holds a PhD in English Language and Literature and an MA Ed in English Education. While Dr. Nowviskie has no library science degree, the Scholar's Lab thrives in its interaction and collaborative research with both students and faculty on campus. Libraries entertaining the establishment of a Common's director position might explore the potential of adding personnel from diverse educational backgrounds into leadership positions in this way. This proposal, which may seem capricious to many in the field, may stand to amplify the standing of the Scholars' Commons in the larger university community.

Key here is the question of whether or not librarians and their staff can better prepare graduate students for research than their departmental faculty and advisers. This is inevitably coupled with the age old question of academic librarians, their status and scholarly expectations of them within their institutions. This issue is not appropriate to rehash here except to say that the leadership of a Scholar's Commons must be sensitive to each institution's policies and practices and culture.

VII. Future Research

The design of a Scholars' Commons has been underway at George Mason University for several years. A new library addition is being built onto the graduate library, Fenwick Library, and is projected to open in 2016; a Research Commons will comprise one floor of the new building. A task force was established during the summer of 2013 and charged with recommending interior features and services that should be offered within the space. The task force has examined other schools' models and has conducted both quantitative and qualitative graduate student assessments in order to

identify student space and services preferences. Initial recommendations were presented to the Associate University Librarian for Research and Education Services at the end of the 2014 spring semester. Analyses of these reports are expected to extend into the 2015 calendar year.

The models discussed here informed the measures utilized in student assessments. With regards to future research, institutional-specific research questions, based on inputs from students, faculty, and staff, will need to be identified and answered before the Commons space is established. These include library staff reorganization and analyses on a Commons operations' impact on institutional and library cultures and usage.

Clearly, there are ample opportunities for external research as well. Consider that the Scholars' Commons is a physical entity: while digital tools such as Infoguides and research portals may supplement students' learning outside of the library, a Commons' space as conceived here is not yet designed to provide optimal service for distance education students. Prospective researchers should question whether changing technology might challenge the importance of physical spaces altogether. One-stop-shops of information and services exist in the virtual realm in the form of aforementioned Infoguides and research portals. Cloud-based instruction and reference allow for ubiquitous convenience and outreach. Access to such services also increases with the use of tablets, smartphones, and other forms of technology that have emerged and proliferated as research tools in recent years.

The purpose of the Scholars' Commons as described here is to provide direct service(s) to the graduate student population in a unified and marketable fashion within the physical confines of the library. Technologies obviously have the ability to nullify the importance of the physical presence of such a space. The question then becomes: Which avenue provides better service for the targeted student base, in-person or online? Should libraries stress the importance of having students actually visit the library? Ways in which libraries might best diffuse similar services and provide support for extended segments of the student population through technology should be considered and explored.

Lastly, longitudinal studies on the overall effects of the Scholars' Commons might interest researchers. The initial intent of the space is to enhance the professional development of graduate students. It would be of interest to determine how much of an impact, if any, the Scholars' Commons might have for an incoming doctoral student. Will the spaces and service make a difference in the student's professional advancement? The authors would suspect yes, but concrete research would verify this belief. In addition, did the collaborative opportunities offered by the Scholars' Commons result in more publications for librarians and library

staff? Again, the expectation is yes, but a research study may produce desirable answers. In sum, opportunities for future research include:

- Analyses of Commons' successes and challenges
- Consideration of Commons' applicability for distance learning
- Role of changing technology in Commons' models
- Long-term studies inspecting the efficacy of Scholars' Commons to influence learning experiences and outcomes

VIII. Conclusion

This chapter reviewed a handful of institutions in the United States which have created Scholars' Commons that, by design, address the need for physical learning spaces, library personnel, and dynamic services that support graduate students. They provide a viable model through which academic libraries may design new or alter existing physical spaces in order to provide services that will benefit the graduate student sector. While the services reported in this chapter are relatively uniform, the collective and shared form of the Commons model tends to be unique in scope. Therefore, though preemptive staff training and space design are essential, a prospective reorganization of library units in order to develop a Scholars' Commons is possible.

Key to the Scholars' Commons model is the reevaluation of library spaces and services that might provide the opportunity for additional campus-based partnerships and address potential shortcomings in the professional academic development of the graduate student. As was intimated, acceptance of this change to services and space may find opposition, as resistance to collaboration, both internal and external to the library organization, may make the initial implementation of the Commons model difficult. Additionally, leadership of a Commons may be undertaken by both librarians and nonlibrarian staff, providing organizational and structural options for administrators.

Library administrators interested in developing Scholars' Commons targeted at their graduate student populations should consider the framework presented in this chapter focusing on key areas: new uses of space, segmented services, partnerships, and new organizational structures. As well, they should reflect upon the other malleable factors noted, such as technologies provided. Libraries should focus their marketing of a Commons and its services to the specific clientele that will utilize the Commons, and the missions of the units involved must be cohesive in their goals, or difficulties may emerge. Scholars' Commons offer opportunities for

increased professional collaborations between librarians and graduate students and greatly enhance the potential for communal partnerships throughout an academic campus.

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The Social Library in the Virtual Branch: Serving Adults and Teens in Social Spaces

Lorri Mon and Abigail Phillips
Florida State University, School of Information, Tallahassee, FL, USA

Abstract

As adults and young adults have become increasingly active on social media, public libraries have incorporated social media alongside their more traditional services. However, libraries are faced with the challenging task of determining how to successfully engage with their users through social media. This chapter examines research literature from both social media and information studies to explore evidence-based results on providing popular information services and resources for adult and young adult users in social spaces. Key elements of social media use by libraries identified in this review include promotion of information resources and services, participation and engagement, social care, pastoral care, outreach, cocreation and motivation of users, advocacy and crowdsourcing, and measurement and assessment. Based on results from current research, best practices and assessment methods for social media are discussed which offer practical considerations for selecting social media platforms appropriate to a library's mission, goals, and objectives, with examples relevant to a variety of social media platforms. The chapter also offers a review of social media platforms, practices, and assessment designed to inform librarians and library managers in decision-making about library social media efforts.

Keywords: Social media; libraries; advocacy; assessment; pastoral care; crowdsourcing

I. Introduction

For adults and young adults, social media has quickly become a "must go" destination where they can connect online with friends, family, colleagues, businesses, and organizations. Millions of Americans have been turning to social media sites such as Facebook, Twitter, Instagram, Pinterest, and LinkedIn for everyday information seeking and sharing since 2005. According to a survey conducted by Nielsen (2012), 171.18 million

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Americans identify as social networking site users. In 2013, Pew Internet estimated that 73% of all online adults in the United States were using social media, with 42% using multiple sites (Duggan & Smith, 2013). Unsurprisingly, Facebook attracted the largest portion, 71%, of online adult social networking users (Duggan & Smith, 2013). For libraries and librarians, this rise of social media presents a new challenge in reconceptualizing public library services for online social spaces.

Social media sites provide a variety of different platforms for interactively sharing and receiving information in a community of users. Facebook (http://www.facebook.com) and MySpace (http://www.myspace.com) offer social networking and sharing of images, video, links, and text, while YouTube (http://www.youtube.com), Vimeo (http://www.vimeo.com), and BlipTV (http://www.bliptv.com) specialize in video sharing. Pinterest (http://www.pinterest.com), Instagram (http://www.instagram.com), and Flickr (http://www.flickr.com) support image sharing. StumbleUpon (http://www.stumbleupon.com), Diigo (http://www.diigo.com), and Delicious (http://www.delicious.com) provide platforms for discovering, sharing, and curating web links, while Goodreads (http://www.goodreads.com), LibraryThing (http://www.librarything.com), and Shelfari (http://www.shelfari.com) enable sharing of book reviews. Twitter (http://www.twitter.com) and Tumblr (http://www.tumblr.com) are microblogging platforms for discovering and sharing news and brief messages which may include image and video links. Sites such as Foursquare (http://www.foursquare.com), Yelp (http://www.youtube.com), and Tripadvisor (http://www.tripadvisor.com) facilitate sharing of crowdsourced reviews and advice about destinations. Using these and other social media sites, users engage and interact around contributed content by posting, replying, re-sharing, subscribing, commenting, liking, up-voting, and down-voting.

Libraries, not unlike social media, share curated content with the community in public spaces where users can engage together or alone around information. Physical spaces in libraries include open collections of books, videos, music, images, and texts, but users can also interact with each other in the public library's workshops, classes, presentations, and group meetings. Affordances of public libraries may include meeting rooms, auditoriums, computer labs, and even fab labs/makerspaces (Newcombe & Belbin, 2012). Public libraries have fulfilled a variety of functions including the public's learning center, memory institution, technology center, community space, and gateway to databases and resources (Brophy, 2008).

Beyond the library's physical manifestation is its extension into virtual space. The library's "virtual branch" (Cahill, 2009) may offer online users access to e-books, articles, and interactions with librarians through

chat, e-mail, instant messaging, or text messaging. Extending community connections and conversations further into new technologies is a natural step for libraries. Brophy (2008) has referred to new opportunities for libraries "around the notion of embedding in lifeflows" in which library support is "surfaced where the users are" (p. 11) whether online on the Internet, within the blogosphere, or in social media.

Many libraries are responding by "becoming social," establishing footholds in online social media platforms and seeking new ways of engaging with their users and communities in social spaces. Carlsson points to increased visibility as one advantage of extending the public library into social space: "We're stuck in the site structure of website for the whole city … makes it harder for people to find us. Facebook and Twitter are very useful for that" (2012, p. 207). OCLC estimates indicated that in 2010, 11% of larger US public libraries had launched Facebook pages (OCLC, 2011), and by Fall 2011, at least 3266 public libraries had established a social networking presence (Crawford, 2014). However, a key ongoing challenge for the field of librarianship is the problem of how to use social media sites by *strategically* and *effectively* in reaching out, connecting, and engaging with adult and young adult users to provide popular information services and resources in social space.

II. Promoting Information Resources and Services

Public libraries have examined the potential of social media to promote information resources and services. Aharony (2012) conducted a content analysis on the Facebook posts of academic and public libraries. Not surprisingly, both types of libraries used Facebook heavily to promote library collections and library services. In 278 posts by academic libraries, 47.5% of these posts highlighted library collections (e.g., journals, databases, books) and 38.5% discussed library services (e.g., library operating hours, programming). In 539 posts by public libraries, 49% promoted library collections and 18.4% library services. Aharony (2012) found that libraries mainly used Facebook as a way to deliver information to users, not to encourage discussion. Likewise in a survey by Rogers (2009) of 545 public and academic librarians and staff members, promoting general library services was selected as the top use for social media at their library (77.7%), followed by promoting programs and services for adults (60.3%) and for children (56.8%), and reaching out to new audiences of users (48.7%).

In a how-to article for academic libraries, Burkhardt (2010) recommends librarians post about library news and events, local information,

request feedback from patrons, respond to patrons, and provide links to videos, images, and articles. For the author, social media is a source for constant communication between libraries and patrons about library services, events, and materials (Burkhardt, 2010). Cahill (2011) evaluated the use of Web 2.0 by Vancouver Public Library (VPL) including Twitter and Facebook, and found that the library had successfully used Twitter to collect feedback from patrons, build enthusiasm within the community, market library services and events, and provide high-quality customer service.

A key issue for libraries is selecting the appropriate mixture of social sites to best meet the needs of users. If a library's purpose in establishing its presence in social space is to reach out to a specific audience, or to share information about particular types of information resources or services, then determining the best social media channel for achieving that purpose becomes an important first step.

Facebook is currently the most popular and heavily used social media site among all age groups (Nielsen, 2014). Neilsen found that among those connecting using computers, the highest monthly audiences were for Facebook, LinkedIn, Twitter, and Pinterest, while among smartphone app users the largest monthly audiences were for Facebook, Instagram, Twitter, Google+, and Pinterest, whereas smartphone browser audiences preferred Facebook, and then Twitter, LinkedIn, and Pinterest. However, given the popularity of alternative social sites, could there be circumstances in which a site such as Pinterest might be considered a better choice for a library than Facebook? In an analysis of 11,000 pinned postings on Pinterest, Zarrella (2013) found that "books," "food," "art," "DIY," "recipes," and "quotes" were among 20 commonly "pinned" words—and many of the 20 most "repinned" words were food-related, including "recipe," "ingredients," and "baking." A library seeking to promote information resources and services around food—for example, launching programs around a healthful nutrition initiative for the local community, or seeking to bring the public's attention to resources and services on recipes, food, and cooking—might do well to consider Pinterest as a social media network with a strong demographic skew toward female users (Duggan & Brenner, 2013; Nielsen, 2012, 2014). Female users often are managing their family's library visits (Gross & Saxton, 2001) in addition to the family cooking and food shopping. As the dominant audience on Pinterest, these female users might also amplify and extend the reach of the library's Pinterest postings on food and nutrition through liking and re-pinning.

A library seeking to promote information services and resources specifically to preteen through young adult age groups might consider Tumblr, a mobile-friendly microblogging site which skews toward younger users

under 30, with 46% of Tumblr users between the ages of 16 and 24 (Duggan & Brenner, 2013; Smith, 2013). McArdle (2013) found at least 125 library branches, systems, and archives operating institutional Tumblr sites. Alternatively for libraries seeking to reach out to more diverse users, Instagram is an example of a mobile-friendly social media site which attracts disproportionately more usage by younger Black and Hispanic users, while Twitter, in particular, is more heavily used by younger African Americans (Duggan & Smith, 2013; Smith, 2014).

It is not uncommon for libraries to have multiple extensions into social space, such as maintaining simultaneous social presences on Facebook, Twitter, Flickr, and YouTube. A typical pattern is sharing library news on Facebook and Twitter, uploading pictures of library events on Flickr or Instagram, and sharing videos of library events on YouTube or Vimeo. Forsyth and Perry (2010) found in a survey of 129 Flickr-using public libraries worldwide that 69.6% of the libraries reported using Flickr for sharing photos of library events and 60.8% for images promoting services, while 35.2% used Flickr to promote collections.

It is worth examining how a library's photographs shared over social sites could provide strategic benefits in promoting information services and resources. Consider the ubiquitous crowd shots of people attending library events. At first glance, these photos look much the same in different library Flickr or Instagram streams, and it is hard to see how these might be important. But in Miami Dade, Florida in 2013, when the closure of 22 of 49 library branches was threatened, a photo showing the crowd of people waiting outside for library doors to open in the morning provided a powerful visual rebuttal to opponents' arguments on nonuse of libraries. Other hard-hitting images shared over social media showed Miami Dade's mayor and commissioners reading storytime books to children in photo ops at libraries they now proposed to close.

Photos can share "behind the scenes" and "sneak peek" images that introduce librarians, library offices, and work spaces, and encourage users to become involved and invested in their library by showing how libraries are changing, improving, and innovating services (Kroski, 2012). Photos also can provide information that helps library users navigate the library and its web site, and learn more about what the library has to offer. Fernandez (2009, p. 36) suggests adding captions such as "bring your questions here" on photos of the reference desk, to help users better understand library services. Manchester City Library in New Hampshire's Flickr stream (https://www.flickr.com/photos/manchesterlibrary) shares photos of event flyers with date, time, and location, and images of useful handouts such as maps of the library floor layouts, as well as snapshots of collection items

that users may not be aware of, from Chilton's Auto Repair manuals for the do-it-yourselfers, to shipping list and passenger list books for genealogists. Annotated photos help to show how to use the library's web site to renew books online. Schnell (2007) points to a variety of information useful for uploading on social media such as floor maps and directories, library tours, and instructional videos. Driving and transit route maps, parking maps, calendars and event flyers, information on what book clubs are currently reading, and other guides which reduce uncertainty and speed up the process of reaching and navigating the library can be very helpful to users in planning a visit.

Libraries also can use social site digital curation features to build entirely new online resources, such as digital image collection of photos or artworks. In 2008, the Library of Congress experimented with making 3100 images publicly available through Flickr, attracting 1.1 million total views in just the first 24 hours, and reaching 3.6 million page views and 1.9 million visits within a week (Springer et al., 2008). More recently however, competition from newer image sharing sites such as Instagram and Pinterest may be diluting the influence of Flickr among some public libraries, and as Wanucha and Hofschire (2013) observed, a decrease in Flickr use by larger US public libraries from 63% in 2010 to 42% in 2012.

On Facebook, analysis of the most successful postings by type indicates that photo postings attract the highest average rate of "likes" (Zarrella, 2013). By adding text directly onto the images, photos can be further enhanced for advocacy, promotion of resources and services, and for the historical record. For example, by adding the library's name and home page on the image along with the event and crowd count ("35 people attended Smith Library's technology workshop on June 3, 2013—http://smithlibrarysite.org") any re-sharing of the image throughout social media continues to include the library's name, contact information, and key contextual information. On Twitter, tweets that include web links tend to be more successful. Researchers observed that highly followed Twitter accounts tweeted more links than less-followed accounts (Zarrella, 2013), and that tweets which contained links were more likely to be re-tweeted (Suh, Hong, Pirolli, & Chi, 2010). On Facebook, video postings performed better than on Twitter, which Zarrella (2013) attributes to Twitter users multitasking and thus being less willing to "spend 4–5 minutes" (p. 85) on watching a posted video. These findings highlight the different nature and audiences of each social site and the potential value for the library of matching posting styles and content to each different social platform, as well as choosing among social sites for best results in promoting informational resources and services to desired audiences.

III. Participation and Engagement

In social media sites, the profile page becomes the voice and the "public face" of the library. Carlsson (2012, p. 206) referred to a "persona tactic" used by staff to represent their library's self in social space—"we created this persona of 'the nice and caring library,' and we try to apply it whenever we post something to Facebook." Yet, in a 2011 study, Facebook pages by libraries were among those attracting the lowest number of "Likes" as compared to pages of other organizations attracting higher numbers of "Likes" such as museums (Zarrella, 2013). How might libraries benefit by applying what has been learned from research into successful engagement in social spaces?

The profile page is the first step in constructing the library's online identity through text and visuals, such as biographies and profile photographs. This profile is what makes the library visible in social media searches (Fichter & Wisniewski, 2008), so it is worth taking the step of filling it out completely rather than leaving it blank or filling in only minimal information such as the library's name. De Jager-Loftus and Moore (2013) observed that of 31 Association of Research Libraries (ARL) member libraries using Pinterest, 28 libraries (90%) linked to the library's home page from the Pinterest profile. In a study of 275 nonprofits on Facebook, only 81% linked back to the organization's web site, and less than half (43%) included a mission statement in their Facebook profile page (Waters, Burnett, Lamm, & Lucas, 2009). Linking to the library home page from social site profiles is critical if one of the library's goals is to steer more online users to the library's main site.

Research on Twitter has found that that highly followed Twitter profiles typically include a picture, filled-out biography, and a home page link (Zarrella, 2013). Biographies, home page links, and profile pictures are part of "impression management" of the library's social self through text and visuals. The profile page offers a unique opportunity to make a "first impression" by reaching out and connecting with new users in social spaces—so how to make the best use of it? Try looking at your library's social site profile and saying out loud the messages conveyed by the choices of text and visuals. Perhaps the biography text mainly includes a general location and founding date, conveying the message "we're here, and we're old," and perhaps the profile picture shows an image of books. Is there more you might like a potential user to "see and hear" about your library in a first impression? Consider the library's mission statement as a possible source for text to use in social media profile biography fields, in order to be able to say more to prospective users about the library's programs, services, and

facilities, as well as about the library's goals and objectives for serving the community.

Another key decision for libraries in social space is selecting roles, audiences, and locations for social media presence. Teens and adults are among the many different audiences in social spaces that libraries have opportunities to serve. Teens and young adults in particular have been leading the way into social media usage. In 2009, 73% of online American teenagers aged 12–17 and 72% of online young adults aged 18–29 in the United States were social networking users (Lenhart, Purcell, Smith, & Zickuhr, 2010). Teen use of Twitter grew from 8% in 2006 to 16% in 2011, and reached 24% in 2013 (Madden et al., 2013). While younger users may describe themselves as less "enthusiastic" about Facebook, this age group continues to participate on the social networking site due to perceived social pressure and expectations even while venturing onto other platforms such as Twitter, Instagram, Tumblr, and Snapchat (Madden et al., 2013).

While many social networking sites have Terms of Service (TOS) agreements that set the minimum age of users at 13 years old, many parents are assisting their under aged children in violating this age restriction. In a survey of over 1000 parents with children between the ages of 10 and14, boyd, Hargittai, Schultz, and Palfrey (2011) reported that 36% knew that their children joined Facebook before the age of 13. Additionally, 68% of these parents stated that they helped their children create these Facebook accounts (boyd et al., 2011). Interestingly, 93% of those surveyed felt that parents, not the social networking site or government, should have the final word on whether their children can participate in online services (boyd et al., 2011). Although surveyed parents reported concerns about their children's online safety, mandatory age restrictions were not seen as a solution to these concerns. Instead, these parents indicated that more parental involvement and education on online safety should be the emphasis of online safety efforts (boyd et al., 2011) As long-time leaders in information literacy instruction, libraries could assist parents and teachers in educating younger users about digital literacy, digital citizenship, and online safety.

Due to young adults' heavy use of social media, some public libraries have developed separate social media profiles specifically for these patrons (Lenhart et al., 2010). The interaction on these profiles ranges from librarian-driven posts with little engagement by young adults to actively geared discussions between young adults and librarians. However, research by Magee, Naughton, O'Gan, Forte, and Agosto (2012) suggests that young adults are engaging more with libraries' young adults' web sites than with their library's social media personas. This may be a result of the social media policies of public libraries, concerns regarding online safety, or weaknesses

in the use of social media by these libraries and librarians (Agosto & Abbas, 2009). One recommendation would be to use existing practitioner and scholarly research to guide improvements in the Facebook, Twitter, Tumblr, and other social media personas of public libraries.

Both young adults and libraries can benefit through their participation in social media. For libraries, these benefits include "broadening the reach of the library's young adult program and services, enabling the library to better support teen's healthy social development, and facilitating opportunities for public librarians to teach teens how to engage in safer online interactions" (Agosto & Abbas, 2009, p. 34). For better or worse, younger users are sharing more information about themselves through social media (Madden et al., 2013), and this presents an opportunity for libraries to engage tweens, teenagers, and young adults in open and honest discussions regarding online safety, digital literacy, and digital citizenship. Younger social media users would benefit from a well-articulated discussion in which they are regarded as mature and intelligent online consumers.

IV. Social Care

Many businesses use social media, particularly Twitter, to offer "social care" services, answering customers' questions and resolving problems. Neilsen (2012) found that 47% of social media users surveyed reported using "social care" customer services via social media. Quick reference, information, and referral, readers advisory and complaint resolution are library functions highly adaptable to the social care model. Librarians operating social media in a social care approach can use an iterative approach of *monitoring*, *engaging*, and *resolution* as follows.

A. Monitoring

Social media channels are not only used to send and receive information, but also as a tool for finding opportunities to engage with and respond to users. As Solomon (2011, p. 3) observed, a key distinction of social media is that "patrons now control the message." On Facebook, librarians regularly check for new comments and questions from users. On Twitter, librarians look for direct messages (Twitter direct messages, and @replies—tweets directed toward the library by including @libraryname) as well as searching on Twitter for any tweets in general about the library or mentioning the library's service area. Librarians undertaking monitoring efforts might search social media on the library's name as well as relevant hashtags (such

as #library) and keywords (question, help, homework), to find out whether someone is mentioning the library or asking for help with a problem or an information need. Users who tweet questions or express complaints about the library represent an opportunity for a librarian to intervene and resolve the issue.

B. Engaging

Upon finding a question, problem, suggestion, or comment about the library posted to social media channels, the librarian responds—thanking the user for the comment and engaging in social care services to help solve problems, recommend resources, and provide information and referrals. By intervening and engaging with library users around their suggestions, questions, and complaints, the librarian takes advantage of a golden opportunity to showcase the library's responsiveness and create happy library users—as the old saying goes, "turning a frown upside-down."

C. Resolution

After engaging in an interaction with the user over social media, the librarian must take the time afterward that is needed to fully resolve the issue, such as investigating and solving the problem, and reporting results back to the user. The social care interaction is incomplete until the librarian has followed through on providing resolution. Necessarily, the social care process is iterative, since continued monitoring and engaging is essential to knowing whether the user's issues have been successfully resolved. In an ethnographic study of a public library in Sweden, Carlsson (2012) noted that Facebook is a platform for users to communicate "their own story about the library" (p. 207). Social care offers the library an opportunity to participate together with users in shaping that story.

V. Pastoral Care

For younger users, "pastoral care" services in libraries provide social and emotional support as well as education and information services (Shaper & Streatfield, 2012). While the term "pastoral care" may be unfamiliar in the library and information studies literature, the concept is familiar to professional librarians. Taken from ministry and education literature, pastoral care refers to the emotional, social, psychological, and educational support librarians provide patrons. For younger users, pastoral care services in libraries

provide social and emotional support as well as education and information services (Shaper & Streatfield, 2012). This type of support is often not included in the job descriptions of librarians. However, for many librarians pastoral care is an important part of their day-to-day experience with patrons (Shaper & Streatfield, 2012).

The key principles of pastoral care, relationships, respect, and responsibility, can be demonstrated in an online environment (Grove, 2004) with the first principle focusing on developing emphatic and trusting relationships with "open and honest communication" (p. 34). The second principle of respect refers to a dynamic environment in which members are respected and appreciated, and the final principle, responsibility, is one where members must come together and take responsibility for pastoral care roles. These three principles are necessary in any library that wishes to successfully satisfy the pastoral care needs of patrons. Particularly in cases of bullying, cyberbullying, or abuse, the three principles of pastoral care become even more apparent. By maintaining respectful and responsible online and offline relationships with patrons, librarians can serve as role models for healthy and constructive relationships. Through pastoral care, librarians can help encourage behaviors that are empathic, responsible, and honest in young adult patrons. These behaviors will be encouraged not only within the physical library but also through the online social media environments of the library.

One example of pastoral care is the concept of library as a safe space. School and public libraries have long provided patrons with a safe and welcoming environment, particularly tweens and young adults (Jurkowski, 2006). According to this author young patrons suffering from cyberbullying, violence, social or developmental problems, or simply dealing with the difficulties of growing up find relief in the neutral supportive space of the library. For young adults, a library's social media profile can serve as an online safe space much like the traditional safe space of the physical library. Through social media, libraries have the opportunity to expand this safe space by providing support through postings on Facebook, Twitter, and Instagram. Far beyond books, librarians are using social media to promote local mental health services, offer bibliotherapy, and provide programming on digital literacy. Additionally, a library's young adult Facebook page can serve as a safe space where young adult patrons express themselves by posting videos, images, and comments. Through the online efforts of librarians, young adult have a way to hone their digital literacy skills, which are necessary in the 21st century workplace.

While social media use by libraries for the most part is a positive experience for adult young adult patrons, there is potential for negative

consequences (Cahill, 2011; Dankowski, 2013; Dempsey, 2012; Rice & Barman-Adhikari, 2013). This is particularly true for young adults who experience cyberbullying, sexual harassment, cyberstalking, and online aggression through social media (Biegler & boyd, 2010). Unlike adults, online privacy is less of a concern for young adults with only 9% identifying themselves as "very concerned" in a survey by the Pew Research Center (Madden et al., 2013), while young adults are less concerned than adults, they are sharing more personal information online and on more social media platforms than ever before.

This openness by young adults in their social media use has implications for libraries. The social media profiles of libraries should be locations for young adults to safely and responsibly express themselves and interact with their library. To ensure this, librarians should monitor how young adults are engaging with their libraries' social media profiles. Additionally, the lack of privacy concerns among young adults provides libraries with an opportunity to educate this age group on digital literacy and digital citizenship. These two skills are necessary in the 21st century workplace and have been shown to prevent cyberbullying and other online dangers from occurring (Agosto, Forte, & Magee, 2012).

Teen advisory boards (TABs) offer another way for public libraries to integrate teen participatory engagement and work with teens on digital citizenship by inviting young patrons to participate in setting up and managing a library's teen-focused blogs, web pages, and teen social media sites. In a study of virtual branch technologies used in public libraries, several public libraries in Washington, New Mexico, and Arizona reported working with local teens to create and maintain library social media sites (Mon, 2011). Some public library social sites can be entirely user-created, and staff may later discover that the library already has a user-created social presence on Foursquare, Yelp, or Tripadvisor. By leveraging TABs, libraries can collaborate with younger users in responsive and participatory design of their social sites.

VI. Outreach, Cocreation, and Motivation

Libraries have pursued a variety of strategies in outreach to users through social sites. One type of library "footprint" in social space establishes single sites through which the library reaches out to all users of different ages, backgrounds, and interests, such as a single official library Facebook, Twitter, Flickr, and YouTube. Alternatively, another type of "footprint" establishes multiple social site versions, each targeted for outreach to a

different user group. For example, Miami Dade Public Library created a "main" set of social sites but also implemented a second set of Facebook, YouTube, Twitter, and Flickr sites for sharing news and events relevant to teens, and showcasing digital projects created by teens at the library (Santiago, 2012). Topeka Shawnee County Public Library established main "all library" Facebook and Twitter accounts (King, 2012), but implemented additional social sites to highlight special units, such as the library's art gallery. Denver Public Library identified several key user constituencies as *contemporary*, *language and learning*, and *children and family* (Murvosh, 2012) and offered social sites reaching out to those unique audiences such as "Fresh City Life" Facebook and Twitter sites highlighting main and branch library adult contemporary news and events, a children's Facebook page and separate Twitter, Facebook, and Flickr sites for teens, a history and genealogy research-focused Facebook, Twitter, and Flickr, and a Spanish language Facebook page. Diversifying allows users to follow social media channels tailored and personalized to their daily lives, saving time for readers by reducing the clutter of unwanted social media messages irrelevant to their needs and interests.

Social sites often involve a cocreation of content, as when users post comments, pictures, or videos to a library's Facebook site, or when libraries re-share content from users on Facebook or Twitter. Davies (2012, p. 19) pointed to the communally constructed nature of social sites when she asked "friendship groups" of teens to show and discuss their postings on Facebook, noting that often, these teens clicked on each other's sites while demonstrating their contributions. In addition to creating online content through participatory conversational interactions with users within social sites, libraries may also directly invite users to contribute content to social sites. At YOUmedia project libraries such as Chicago Public Library and Miami Dade Public Library, teenagers and library staff collaboratively create collections of digital videos and photos, posting their contributions to social sites such as Flickr and YouTube (Santiago, 2012). Library social sites may also engage crowdsourced volunteers to support and help cocreate digital collections. A popular use of video social media platforms like Vine, Vimeo, and YouTube within libraries has been creating and sharing short book reviews and author book talks, including running contests for user-created videos. At New York Public Library, Facebook and Twitter were used to recruit thousands of volunteers for help in transcribing over 8500 historic menus and build a collaboratively created searchable historic restaurant menus collection (Petit, 2011).

Flickr, Diigo, Pinterest, and Goodreads are examples of social sites that allow individuals not only to create digital collections, but also to

contribute to collaborative collections such as sharing digital images, bookmarks of web links, pinned images and links, or book review links to group collections of communally created content. Ekart (2010) recommends that libraries can use participatory collection-building features on Flickr to commemorate banned book week and national library week, or invite users to contribute photos that document historic community events such as a hurricane's impact on the local community. Naik (2012) describes a Salt Lake City, Utah library creating a Goodreads group page, and suggests that "bibliosocial networking sites" (p. 320) could lead toward a rethinking of traditional readers advisory, opening it up to participatory contributions from both librarians and users. These sites, such as Goodreads, Shelfari, and LibraryThing which offer crowdsourced user reviews of books and online book discussion groups, can also connect libraries with some of the most avid and engaged readers in the local community.

Crowdsourcing represents another facet of the social media ecosystem which impacts user perceptions of libraries, and suggests another avenue for engaging with users. Crowdsourced review sites such as TripAdvisor (http://www.tripadvisor.com) and Yelp (http://www.yelp.com) allow users to provide ratings and reviews for local businesses and attractions, including libraries. Library profiles on Yelp and other crowdsourced review venues such as Foursquare (http://www.foursquare.com) encourage users to "check in" at the library, showing other users when they are currently there, and inviting users to leave tips and suggestions of things to do at the library.

Crowdsourcing of library advocacy efforts can take a variety of forms, but all of them have in common efforts to promote and support the library using social media. Many public libraries in the United States are dependent primarily on local funding that is voted for by the members of the community through levying millages. Crowdsourced profiles which express positive views of the library on social review sites such as Yelp, Tripadvisor, and Foursquare can influence public perceptions, as with crowdsourced "challenges" for users to select the top attractions in local areas. Libraries can also build support through engaging in public advocacy campaigns on social media sites such as "Friends of the Library" and "Save the Library" campaigns, requesting help from the public in everything from letter-writing and phone calls to public officials, to volunteering and donations. Crowdfunding sites such as Indiegogo (http://www.indiegogo.com) have been used to raise funds for library projects or to help meet funding shortfalls (Lewis, 2013), and many libraries including Oakland Public Library have created "wish lists" on Amazon.com to enable crowdsourced gift purchases (LJ Staff, 2003). These efforts allow users to get directly involved in

funding the collections, projects, services, and resources that they want to support at their local libraries.

In all efforts toward outreach, cocreation, and crowdsourcing, motivating users is a key concern. Social sites have been successful in designing features and incentives to entice users, and libraries are taking inspiration from social sites in seeking new ways to attract and motivate users. Chicago Public Library incorporated aspects of social media into the design of their web site (www.chipublib.org), described as "Pinterest meets Amazon" (Dellimore, 2014, p. 6), with a redesigned web site combining the functionality of blogs with the visual experience of social media sites like Facebook and Twitter. Nashville Public Library and Oakville Public Library among others have experimented with integrating social tagging in their online catalogs (Lawson, 2009), allowing users to click on popular crowdsourced tags and tag clouds to retrieve content.

Offering extra value to social media followers can create a powerful incentive, as when the library's social media followers receive first notification of special events and new library purchases. Crawford (2014, p. 59) advises, "make followers feel like the "in-crowd"—tell Facebook first." Libraries might also consider real time updating via Twitter to give a "heads up" letting users know when the library's bookmobile or mobile technology van is enroute to the next stop in local neighborhoods around the community. Real time updating has been a successful strategy for food trucks in the business world (Solomon, 2011). Food trucks are often given names, and their travels, breakdowns, foibles, and upgrades become part of the local color "story" that fans enjoy following via social media updates, photos, and videos.

Canton Public Library and Ann Arbor Public Library have taken social media aspects into library literacy efforts by integrating gamification into summer reading programs (Spina, 2014), inspired by social sites such as Foursquare where users earn badges for checking in at special locations such as libraries for which they can earn a "bookworm" badge. On Foursquare, the user who has checked in most frequently within the month is named the "Mayor," and some organizations further incentivize their "Foursquare Mayors" by offering special deals. By adding Foursquare-style gamification to the summer reading program, Canton Public Library sought to increase positive patron interactions and improve overall participation (Spina, 2014). At Canton Public Library's gamified summer reading program in 2011, over 1600 users earned 2871 digital badges in the first year, while at Ann Arbor Public Library over 5000 participants completed reading goals of more than 5 million pages, and enriched the library's catalog with nearly 300,000 user-created social tags and over 29,000 written reviews (Landgraf, 2011; Spina, 2014). These programs highlight new synergies libraries are

developing between social technologies and traditional programs and services.

VII. Measuring and Assessing the Results of Social Media Activities

Public libraries have been quick to establish a presence on social media since the explosion in popularity of Facebook and Twitter in 2008–2009, and professional journals have frequently discussed the benefits of social media use in libraries, highlighting best practices, and identifying strategies for reaching different user populations (Dankowski, 2013; Enders & Winehouse, 2012; Hardin, Klug, & Williams, 2012; Horn, 2011; Solomon, 2011). However, scholarly research into the strategic and effective use of social media in public libraries has only slowly begun to be published. Often, this research takes the form of case studies of the social media strategies and tools of individual libraries (Chu & Du, 2012; Ezeani & Igwesi, 2012; Vucovich, Gordon, Mitchell, & Ennis, 2013). However, evidence-based research into understanding of how library patrons engage with social media and how this engagement can be measured is necessary for libraries to determine the success of their social media use.

At the most basic level, success of the social media effort is assessed and quantified according to activity by the library and by the users. Activity by the library is measured in total postings and frequency of postings, while users' activity is tracked in responses to library postings by "viewing," "friending," "liking," "following," "commenting," "mentioning," and "sharing" or "re-sharing." For example, after an analysis of VPL staff tweets, Cahill (2011) developed a list of best practices for Twitter postings and recommend a set of possible performance measures including, "number of re-tweets," "volume of feedback from followers (solicited and unsolicited)," and "number of re-tweets of VPL content by followers."

However, beyond these basic statistics, an important question is: *how has this social media activity contributed to furthering the library's mission, goals, and objectives?*

Key areas in which social media can measurably contribute to the library's mission, goals, and objectives include:

- *Impact*: increasing attendance at library programs and increasing usage of services and resources;
- *Influence*: improving the library's access to and standing with key influencers such as government officials, journalists, and funders, as well as with the general public; and
- *Reach*: amplifying the library's message to reach and engage desired audiences.

Assessing the impact, influence, and reach of the library's social media requires more effort than simply counting followers, friends, and likes. For example, Crawford (2014) suggests assessing friends or followers as a percentage of the library's service area. To what extent has the library's social media attracted its following from within the library's own geographic service area? Crawford's study (2014) found some small US public libraries whose social media pages were "liked" by half the people in the local community, as compared to larger public libraries with pages "liked" by from 2.6% to 7% of the community. In another example of analyzing followers, librarians at a Texas university library wanted to know, "Who is following us?" An analysis of 432 library Twitter followers revealed that less than half (45%) were affiliated with the university and 24% of those were students (mostly undergraduates) while 7.6% were faculty (Sewell, 2013). These results allow a library to set further actionable goals, such as to increase social media outreach efforts for underserved areas of the community or particular user groups.

Planning an impact assessment might involve measuring traffic to the physical library or to specific library web pages before and after Facebook or Twitter postings, or measuring usage of particular resources before and after a social media promotion. Crawford (2014) notes that a Nevada library reported an increase in attendance at programs as an impact of using Facebook. In 2006, Denver Public Library launched a teen-focused MySpace page and successfully increased traffic to the library's teen web page by 41% (Gauder, 2007). Influence can be explored in social media postings that generate support for the library by prompting positive media coverage, positive perceptions in public polling, and generating statements of support or votes by the public and government officials in favor of library funding (e.g., a social media posting in a library advocacy effort that links users to an online petition, or provides talking points and templates for making phone calls and writing library advocacy letters and e-mails). Solomon (2011) describes a social media advocacy effort for Ohio libraries that generated thousands of phone calls and over 37,000 e-mails to legislators, ultimately saving over $147 million in library funding.

A library social media manager assessing influence might also take an accounting of the number of key influencers who are among the library's friends and followers on social media such as government officials, funders, journalists, and other community leaders. Reach can be assessed through friends and followers who are important "re-sharers" of postings, as well as by tracking increased reach into new locations throughout the community through the expansion of friends and followers into new geographic areas, neighborhoods, and social circles within the community.

Social media management tools can be helpful in making evidence-based assessments—for example, Tweet Reach (http://tweetreach.com/) can be used to examine the extent to which a particular Twitter posting reached a wide audience, SocialBro (http://www.socialbro.com/download) can provide recommendations of the best times to tweet in order to reach a wider audience among Twitter followers, and PeerIndex scores (https://peerindex.com/) offer an overall Twitter influence score based on ratings for user engagement, reach, and influential followers; libraries can compare their own score with the scores for other peer or aspirational libraries. Crawford (2014) advises librarians to "keep an eye on what the most people interact with" (p. 59) to be able to replicate successes. Small-scale assessments of a single Facebook posting or Twitter tweet, or how a PeerIndex influence score fluctuates from week to week, can help to provide insights on how to post and interact more successfully with users. Available social media management tools are continually changing, but can be worth investigating as a useful supplement and extension to the capabilities of a social site's in-built analytics resources.

In improving social media posting strategies, key factors to consider are *visibility*, *recency*, and *amplification*:

- *Visibility*: Are library social media sites easily "findable"? This not only includes visibility on the library's home page but also linking the library's social media sites to each other, as well as the extent to which the library's social media sites are made more visible by being re-tweeted, re-shared, blogged about, and mentioned by others in social media. Is the library included on Twitter lists, and linked in StumbleUpon? Does the library appear in crowdsourced review sites such as TripAdvisor, Foursquare, or Yelp, and what sentiments are expressed—are comments positive, negative, or neutral? Do efforts toward increasing visibility warrant adding new sites that might reach new targeted audiences, and might those particular targeted audiences be reached through a specific social site such as LinkedIn, Twitter, Instagram, or Pinterest?
- *Recency*: Has the library's social media site been kept up to date with correct links and information? Are there recent postings? Users will tend to stop following a library social media site that appears dormant or dead. However, too-frequent posting can also present a problem, and optimal posting frequencies are not necessarily the same across social media sites. For example, Facebook is primarily used for updates about friends and family (Quan-Haase &Young, 2010). If too-frequent library Facebook postings crowd out the news from friends and family, users may unfollow the library. Zarrella (2013) found that popular Facebook pages tended to be updated four to five times per week. Twitter, by contrast, is often used as a general news site. Popular Twitter pages tweeted as much as 22 times per day (Zarrella, 2013), and one library was observed to tweet over 10 times per day (Crawford, 2014).
- *Amplification:* Has the library established a following that will help to amplify the reach of the library's social media postings? Solomon (2011) recommends that "your library should be following back roughly the same number of people following it" (p. 33). On social media, friends and followers are not merely a passive audience to be perceived as recipients for one-way communications. Friends and followers amplify the message by interacting with the library's postings—"liking," "commenting on," "re-sharing," and "re-tweeting," —thus making the posting

visible to more people beyond the library's immediate circle of followers. This role of friends and followers in amplifying messages is essential to reaching the widest possible audience, which is why it is problematic when libraries do not reciprocate by following back or responding to other users on social media.

Reciprocity is at the core of engagement and interaction in social media. Following, friending, liking, and re-sharing others' postings encourages similar reciprocity toward the library, thus widening the library's reach and circle of influence. Solomon (2011) refers to "earning social capital" (p. 20) by thanking people, asking for opinions, linking to and re-sharing others, giving credit, and encouraging others. Assessment of the library's successful engagement in social media therefore should not only include tracking the library's activity in postings and in attracting followers, comments, likes, and re-sharings of the library's social media, but also assessing the extent to which the library is following, re-sharing, and interacting with others—that is, exploring how effectively the library's social media engages with and reciprocates the activities of users.

VIII. Policy and Privacy

A useful tool for guiding social media efforts is to establish a library social media policy. This policy serves as a helpful guide for the library's social media managers and a training tool for new staff, as well as providing transparency for library users on how the library will handle communication and interaction on social sites. Social media policies typically will include the library's goals for the social media sites, who will speak for the library on social sites, issues of content and style, and frequency of postings (Enders & Winehouse, 2012; Grensing-Pophal, 2010; Lammers, 2012). Also important to consider in a social media policy are questions of how users' comments and contributions on the library's social sites will be handled both in terms of allowable comments and postings, and in privacy issues for users regarding how social media information may be tracked or kept in a library's assessment efforts.

Perhaps because social media in libraries is still so relatively new, as yet there has been only limited consideration given in the professional literature to the privacy concerns for users of library social media sites (Zimmer, 2013) or to the ethics of social media for librarians (Wasike, 2013). The literature primarily focuses on basics of understanding social media within librarianship, and on launching and managing a library's social sites. Indeed, it was not long ago when the concept of libraries engaging with social media was nearly unheard of. In 2006, a survey of 126 academic

librarians by Charnigo and Barnett-Ellis (2007) found that 54% perceived Facebook as not relevant as an academic endeavor while 34% were not sure. A librarian in the survey commented, "*most librarians at my institution are unaware of social software in general, much less Facebook*" (Charnigo & Barnett-Ellis, 2007, p. 27). Yet only 4 years later in 2010, researchers found 89 of 100 ARL member libraries were operating Facebook sites and 85 of these libraries were using Twitter (Mahmood & Richardson, 2011). Likewise, among the 84 largest US public libraries in 2010, 80% had adopted Facebook and 68% were on Twitter (Lietzau & Helgren, 2011). As the research within this field continues to mature beyond the early adoption stage, more attention is likely to focus on ethics and privacy guidelines for libraries using social media.

IX. Conclusions and Implications

Public libraries have increasingly become social libraries, with the largest public libraries leading the way as early adopters of social media. Wanucha and Hofschire (2013) in analyzing a sample of 584 public libraries stratified by service population size found that in 2012, 93% of the 84 largest US public libraries had a social media presence, with commonly used social sites consisting of Facebook as a social network (93%), Twitter for micro-blogging (84%), either YouTube or Vimeo as a video site (60%), and Flickr for image sharing (42%), and other less common choices including Foursquare (31%), Pinterest (23%), Google+ (8%), and Tumblr (8%). Even among the US public libraries serving the smallest populations of 10,000 or fewer, the study found that the majority (54%) had at least one social site in 2012, typically Facebook (54%) (Wanucha & Hofschire, 2013). Between 2008 and 2010, US public libraries in the study had doubled their use of Flickr, and increased their use of Facebook by nearly 700% (Lietzau & Helgren, 2011).

Social media activities explored by libraries have included:

- Promoting library news, events, resources, and services (Burkhardt, 2010; Gauder, 2007; Tarulli, Anwyll, & Chawner, 2013).
- Connecting the library with new audiences (Carlsson, 2012; Tarulli et al., 2013); particularly younger users who may be less reachable via other platforms such as e-mail (Rogers, 2010).
- Providing services directly over social media such as reference and readers' advisory (Tarulli et al., 2013).
- Searching and monitoring for mentions of the library within social sites to provide user assistance and complaint resolution (Fichter & Wisniewski, 2008; Rogers, 2009).
- Involving users in participatory interactions such as giving feedback about proposed library initiatives or engaging in voluntary collection-building efforts (Petit, 2011).

- Conducting library advocacy efforts among journalists, government officials, and members of the community (Rogers, 2010).
- Using digital curation to create research resources for users within social sites (Richardson, Vance, Price, & Henry, 2013).
- Integrating social media concepts and technologies such as gamification, digital badges, and other aspects into traditional library programs and services (Landgraf, 2011; Spina, 2014).

Since rapid changes can occur in functionalities, usage, and popularity of social sites, Solomon (2011, p. 1) observes that "tools are ephemeral." Libraries should not only regularly assess social media activity but also consider whether current social media sites are still effective platforms overall for reaching users. For example, Mon and Randeree (2009) found that in a 2008 study of 242 US public libraries nationwide, MySpace was the top social media platform in use with 95 libraries using MySpace as compared to only 38 using Facebook. However, by 2009, users were abandoning MySpace and switching to Facebook, and the libraries followed. In the span of just 2 years from 2008 to 2010, Lietzau and Helgren (2011) observed public library usage of Facebook changing from "a relative non-factor to near ubiquity" among the largest public libraries in their study, with only 8% of these libraries using Facebook in 2008 as compared to 80% by 2010. Likewise, the swift rise to popularity of two new sites launched in 2010, Pinterest and Instagram, underscores the need for libraries not only to assess the effectiveness of social media *efforts*, but also periodically assess the impact of social media *platforms* being used and consider when changes might be warranted.

Libraries have experimented with a variety of social site configurations, ranging from a small set of sites such as Facebook for social networking and perhaps a video or image sharing site, to much larger and more complex configurations of multiple social sites representing different special units within the library and sites targeted toward different library user groups. Regardless of size or shape of a library's social "footprint," an essential consideration is aligning the library's selection of social media platforms and posting strategies with the library's overall mission, objectives, and goals, including measurable outcomes in support of key library priorities (Koontz & Mon, 2014). However, evaluating social media activity in relationship to the library's larger priorities requires effort beyond assessment basics of numbers of followers and their activities in liking, posting, commenting, and re-sharing. Assessing the larger impact, influence, and reach of the library's social media efforts requires measures such as:

- Increased traffic to the library's web site or increased attendance at library programs and events (Crawford, 2014; Gauder, 2007);

- User-created contributions and achievements such as digital videos contributed to a library contest, photos added to a cocreated library image collection, tags added to the library catalog, and digital gamification badges earned by accomplishing reading or literacy learning goals (Landgraf, 2011; Petit, 2011);
- Phone calls, letters, and e-mails from users, volunteer time worked, and donations in response to library advocacy efforts (Lewis, 2013; Solomon, 2011);
- Representativeness of followers and friends in terms of outreach goals to specific user groups, geographic areas, and influencers within the community such as local government officials, journalists, business leaders, and educators (Crawford, 2014; Koontz & Mon, 2014).

The rise of the social library reflects a broader response from libraries to increasing user demands for virtualization of library collections and services. Today's users want online access to libraries from wherever they are, along with the ability to download e-books and digitized articles from databases, and to receive online help from librarians via personal computers, smartphones, tablets, or other mobile devices. Social sites are one aspect of a broader spectrum of technologies offered by libraries that also includes library blogs, RSS feeds, e-mail newsletters, library mobile apps, and digital reference services via chat, e-mail, or by text messaging. Wanucha and Hofschire (2013) noted that in 2012, 43% of the largest US public libraries offered reference services via text messaging, 57% offered chat reference, and 79% offered e-mail reference services, while 63% operated library blogs, 58% offered RSS feeds, 60% provided e-mail newsletters, and 60% offered mobile apps for smartphone and tablet users. At the same time, US public libraries served as technology spaces for communities, in some communities functioning as the only free local source available for access to computers and wireless Internet (Bertot, McClure, & Jaeger, 2008). Trends toward public libraries adopting the latest new technologies have continued with launches of YOUmedia digital youth learning lab spaces at Chicago Public Library, and Miami Dade Public Library, teen learning labs at Nashville Public Library and Columbus Metropolitan Library among others (Santiago, 2012), and Makerspaces/Fab Labs with 3D printers at Fayetteville Free Library, Westport Public Library, Allen County Public Library, and Cleveland Public Library (Gutsche, 2013; Newcombe & Belbin, 2012).

The social library of the future will likely continue to integrate the latest developments in new tools and technologies. A substantial movement toward a library that is not just social but also mobile is already underway. Libraries are integrating mobile-friendly versions of their web sites, adding "text a librarian" question-answering services to accommodate cell phone and smartphone users, and exploring mobile-friendly social sites such as Tumblr, Instagram, and Twitter. Libraries also are offering mobile apps from vendors such as Boopsie (http://www.boopsie.com) and Bibliocommons

(http://www.bibliocommons.com/products/mobile) to allow Android and iPhone mobile users to use a customized library app to search the catalog, place holds, and use other library features and services.

Beyond social and mobile, libraries are also making available some of the latest technology innovations in wearable computing devices to patrons, such as Google Glass and Occulus Rift at Arapahoe Public Library (Asgarian, 2013). If there is one constant in social media, it is change, and social libraries will require librarians to be nimble and adaptive technology leaders and innovators willing to connect and engage with users over whatever technologies they are using, meeting them wherever they are located at the point of need.

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