Intersections of
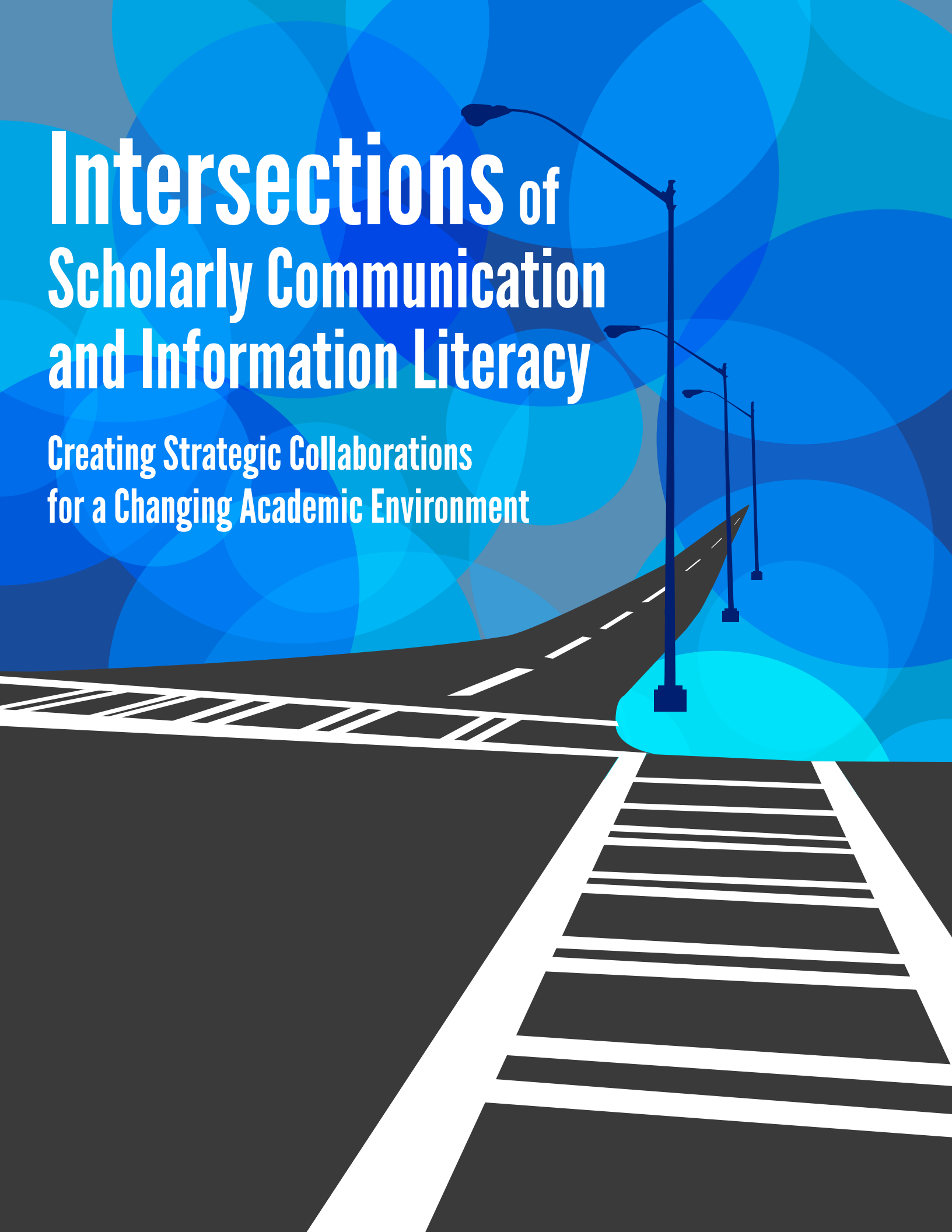## Scholarly Communication
and Information Literacy

Creating Strategic Collaborations
for a Changing Academic Environment

Citation:

Association of College and Research Libraries. Working Group on Intersections of Scholarly Communication and Information Literacy. *Intersections of Scholarly Communication and Information Literacy: Creating Strategic Collaborations for a Changing Academic Environment.* Chicago, IL: Association of College and Research Libraries, 2013.

Published online at http://acrl.ala.org/intersections

The cover design for this report was inspired by the cover art of the book *Common Ground at the Nexus of Information Literacy and Scholarly Communication* (Davis-Kahl and Hensley , 2013), which was created by Lisa Peltekian, Illinois Wesleyan University, Class of 2013.

Contents

Executive Summary

This white paper explores and articulates three intersections between scholarly communication and information literacy, arguing that these intersections indicate areas of strategic realignment for librarians in order for libraries to be resilient in the face of tremendous change in the scholarly information environment. The three intersections are:

1.) economics of the distribution of scholarship (including access to scholarship, the changing nature of scholarly publishing, and the education of students to be knowledgeable content consumers and content creators);
2.) digital literacies (including teaching new technologies and rights issues, and the emergence of multiple types of non-textual content);
3.) our changing roles (including the imperative to contribute to the building of new infrastructures for scholarship, and deep involvement with creative approaches to teaching).

Based on these intersections, this paper provides strategies that librarians from different backgrounds and responsibilities can use to construct and initiate collaborations within their own campus environments between information literacy and scholarly communication. These strategies, or core responses, will support libraries in becoming more resilient in the face of the changing digital information environment.

After articulating these intersections and exploring core responses, the paper recommends four objectives, with actions for each, which could be taken by the Association of College and Research Libraries (ACRL), other academic library organizations, individual libraries, and library leaders. The overarching recommendations are:

1.) integrate pedagogy and scholarly communication into educational programs for librarians to achieve the ideal of information fluency;
2.) develop new model information literacy curricula, incorporating evolutions in pedagogy and scholarly communication issues;
3.) explore options for organizational change;
4.) promote advocacy.

This white paper is issued as both a PDF and an interactive format, available at http://acrl.ala.org/intersections. The latter serves to "model new dissemination practices," an objective of ACRL's *Plan for Excellence* (2011). Moreover, we hope readers will add comments and reactions there to help further the conversation.

Introduction

Goal and Structure of the Paper

In this white paper we present a case for exploring and articulating the intersections between scholarly communication and information literacy. We argue that these point to areas of strategic realignment of the roles of librarians in order for libraries to be resilient in the face of tremendous change in the scholarly information environment. Based on these intersections, this paper provides strategies that librarians from different backgrounds and responsibilities can use to construct and initiate collaborations within their own campus environments between information literacy and scholarly communication. Awareness of these intersections and strategies equips librarians with the insights they need to develop formal and informal educational programs that prepare their constituents to function in the dynamic digital environment of contemporary scholarship and to improve the current scholarly communication ecosystem.

In this paper, we identify three intersections between information literacy and scholarly communications that have developed as a result of the effects of the digital age on scholarly publishing and on teaching information research skills:

1.) economics of the distribution of scholarship (including access to scholarship, the changing nature of scholarly publishing, and the education of students to be knowledgeable content consumers and content creators);
2.) digital literacies (including teaching new technologies and rights issues, and the emergence of multiple types of non-textual content);
3.) our changing roles (including the imperative to contribute to the building of new infrastructures for scholarship, and deep involvement with creative approaches to teaching).

Our identification of these intersections is intended to serve as a guidepost directing librarians to core strategic responses to the profound impacts of the digital revolution on both information literacy and scholarly communication. The core responses that we believe are necessary in the changing digital information environment reflected by these intersections are as follows:

1.) towards information fluency: We make a case for the collaborative development of educational programs to support the cultivation of information fluency among our students, faculty, and staff;
2.) evolutions in pedagogy: We acknowledge the importance of adopting and adapting approaches to teaching that support student learning in the digital information environment, and of integrating new kinds of content in our teaching;
3.) opportunities for collaboration and changes in organizational structure: We emphasize the need to develop new collaborations and make dramatic changes in the organizational structures of academic libraries.

All of these responses require new professional development opportunities for librarians.

Origins of the White Paper

The need for a white paper that could articulate the intersections of scholarly communication and information literacy emerged after numerous discussions throughout ACRL. A discussion on "global trends and local actions for liaison and teaching librarians to support changes in scholarly

communication" in 2011 highlighted the changing demands on librarians. Joyce Ogburn's column in ACRL's news magazine *C&RL News* "Lifelong Learning Requires Lifelong Access" (Ogburn, 2011) provided leaders of ACRL's scholarly communication initiative with the focus and support needed to move ahead with this white paper.

Developments within our professional associations reinforced the importance of promoting this conversation within and across the profession; for example, ACRL has just published a book entitled *Common Ground at the Nexus of Information Literacy and Scholarly Communication* (Davis-Kahl and Hensley, 2013). In June 2012, an ACRL task force reviewed the Information Literacy Competency Standards for Higher Education and recommended extensive revision to include acknowledgment of complementary literacies (including digital literacy, media literacy, and visual literacy) and to address the role of the student as content creator (ACRL, 2012). The ACRL Board approved these recommendations and, in fall 2012, ACRL began appointing a task force to undertake the revisions. Also in fall 2012, the American Library Association (ALA) Office for Information Technology Policy (OITP) Digital Literacy Task Force was circulating a draft report (2012) that defined what it means to be a digitally literate person as a consumer and creator. Finally and fundamentally, ACRL's strategic directions in the *Plan for Excellence* (2011) has goal statements in three areas: Value of Academic Libraries, Student Learning, and the Research and Scholarly Environment. The language of those three goal areas could be linked to create the following assertion:

> In order for academic libraries to demonstrate alignment with and impact on institutional outcomes, librarians must accelerate the transition to a more open system of scholarship and transform student learning, pedagogy, and instructional practices through creative and innovative collaborations.

Librarians are uniquely situated to lead in these areas.

In response to these concurrent developments, a working group of practicing academic librarians was formed in late 2011 (see Appendix A: Working Group Members) and first met in January 2012. The contributors to this white paper come from diverse institutional settings, with backgrounds in a broad range of disciplines, and varied perspectives on what constitutes an intersection of information literacy and scholarly communication. Through meetings, discussions of these issues, and the iterative process of composing this white paper, the authors identified several broad areas of common concern for scholarly communication and information literacy librarians (for more detail, see Appendix B: Process for Developing this White Paper). Our discussions focused on what academic librarians teach, how we teach in the digital information age, and how our roles, collaborations, and organizational structures are changing. We drew from examples in our own practices as librarians and from the professional literature. Some of us work with students as authors and editors. Others have capitalized on our institutional repositories to develop educational outreach programs. Some of us have grappled, as subject specialists and liaison librarians, with demonstrating expertise both as teachers and in scholarly communication issues. Despite our diverse experiences, the working group was able to develop and agree upon a fundamental argument for the importance of exploring and articulating intersections between scholarly communication and information literacy.

Foundations of the Argument

Librarians' work practices, discussions, and professional literature all confirm that our roles have been changing rapidly in the digital information environment and will continue to do so. In constructing this paper, the working group agreed on the following interrelated assertions:

- Every librarian in an academic environment is a teacher.
- All roles in an academic library are impacted and altered by the changing nature of scholarly communication and the evolution of the dissemination of knowledge.

Therefore, every librarian has a role in teaching, whether formally or informally, about scholarly communication issues.

In addition to these foundational assertions, the argument of this white paper assumes the following basic definitions of scholarly communication and information literacy:

- *Information literacy* is defined as a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate, and effectively use the needed information. Teaching these skills has always required an implicit awareness of the social, economic, and legal conditions for the communication of scholarship within specific disciplines. The fragmentation caused by digital technologies, however, and the unprecedented, unmediated access to scholarship that is now possible, forces us to adapt our approaches to teaching users to be fluent in the new information environment.
- *Scholarly communication* refers to the systems by which the results of scholarship are created, registered, evaluated, disseminated, preserved, and reshaped into new scholarship. The unprecedented ease of reproduction and distribution of information due to digital technologies has opened wonderful opportunities for sharing scholarship. These developments have dramatically broadened the opportunities for the dissemination of ideas, research, and scholarship, but they have also put new pressures on intellectual property rules and policies within the academy and beyond. (Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities)

Environmental and Organizational Context

The tremendous changes in the global digital information environment and in higher education are well documented. For background to our exploration of the intersections of scholarly communication and information literacy, we selected just a few of the many external forces that have a large impact on libraries. These are:

- the turmoil in scholarly publishing;
- a desire among faculty for a scholarly publishing infrastructure that meets their needs for greater access and broader impact;
- a desire among many students to publish their work online to the world;
- the need among our users to find, manage, and cite massive amounts of digital information in different formats;
- the demand for tools for easily finding, sharing, and reusing that information.

The turmoil in scholarly publishing is a symptom of the significant challenges to the established model of scholarly publishing. These challenges include the proliferation of digital information technologies and

growing requirements for scholarly output to have a broader impact and therefore be more open for use and reuse. The current model of scholarly publishing is decidedly unsustainable. The "serials crisis," which describes the results of declining library budgets and rising subscription costs, has given rise to a steadily growing movement on the part of librarians, faculty, and students to reinvent scholarly publishing and to retain more control over the results of faculty and student output. Some publishers are experimenting with new business models for open access publishing, including using article processing fees as a source of financial support, while others are embracing alternative methods to meet the desire for greater access to scholarship. New venues for open access publishing for both journals and monographs are becoming available (such as PeerJ and Open Humanities Press), but no one model has emerged as the solution to the major issues in publishing. In this era of rapid change and experimentation, all stakeholders need to grapple with the difficult questions about the sustainability of traditional and new models of scholarly communication. Business models, such as subscriptions for journals, that made sense when the means of distribution were expensive and scarce may prove quite inefficient in a digital environment. The most efficient and sustainable models will certainly not emerge quickly, and so we are likely to see many different experiments for the foreseeable future.

The focus of an academic library must be highly relevant to the institutional mission, and many institutions now list extending the global reach of their research and teaching as key parts of their missions. There is a growing interest in higher education to promote the global impact of faculty and student scholarship and creative activity. Institutions are adopting open access policies, supporting publishing programs, and developing institutional repositories to further this goal. New products and services to help accomplish this are emerging from consortia that are providing open source options and fee-based services from commercial publishing and repository platform providers. We also see this imperative represented in rapidly emerging ways of extending the reach of the academic community by teaching to a broad audience through open online courses. Many institutions are engaging in the type of academic experience offered by MIT's OpenCourseWare and through Massively Open Online Courses. The imperative to make the work faculty produce as teachers more openly available is new, controversial, and inconsistent across higher education institutions. However, where an institution adopts such programs, the library can best support these initiatives through collaborations among teaching and scholarly communication librarians, bringing to bear skills and knowledge in teaching, copyright, access to content, and publishing. This collaboration can support faculty in their development of more open course materials, since the high cost of textbooks is a major concern of students and faculty alike.

All of these trends compel academic librarians to further develop our roles in support of the goal of broad dissemination and access to information. This includes educational programs at all levels about new ways to accomplish these charges. Transformations in the publishing and education environment provide abundant opportunities for collaboration and partnerships among scholarly communication and information literacy experts to meet the educational needs of faculty and students in the digital information age. We explore specific opportunities in the following section with intersection 1, Economics of the Distribution of Scholarship.

The challenges teaching librarians face now go far beyond bibliographic and textual information to include data, many types of media such as video and sound, as well as social media. Developing responses to questions in these areas requires librarians to impart a deeper knowledge of the life cycle of scholarship, the environment in which it is created, the social life of information, and an understanding of the inequities in access to both the information and to the tools necessary to use that

information. In intersection 2, Digital Literacies, we acknowledge the demands of digital literacies and new concepts that affect how we teach, in particular, transliteracy.

Looking internally, we see that the roles of academic librarians are evolving. These evolutions have in some cases been aided or provoked by organizational change. They reflect new ways of coping with declining library budgets amid new demands for information resources by reallocating staffing and redistributing collections budgets. As indicated in *The 2012 State of America's Libraries: a Report from the American Library Association,*

> Academic librarians and their colleagues in higher education in the United Sates also continued to navigate a "new normal," characterized by stagnating budgets, unsustainable costs, increased student enrollments and reduced staff, and the pressure on higher education to demonstrate value took on new urgency and importance in 2011-2012. (p. 3)

We explore the effects of these changes more fully in intersection 3, New Roles for Librarians.

Academic librarians find responses to these internal and external challenges in ACRL's strategic plan, the *Plan for Excellence* (2011), which describes a desired future where, "Librarians drive and enable the transformation of libraries, student learning and scholarly research." ACRL's report *The Value of Academic Libraries* (2010) urges libraries to demonstrate and develop their impact on student learning. Librarians need to intentionally integrate the challenges inherent in the changing scholarly publishing landscape with information literacy curricula to provide high impact teaching and learning experiences. There are many new "teachable moments" when the whole scholarly ecosystem is considered. For libraries to be resilient in this evolving academic environment, they must take advantage of all the opportunities provided by a period of disruptive change.

Intersection 1: Economics of the Distribution of Scholarship
The changing nature of scholarly publishing, and the education of students to be knowledgeable consumers and content creators

1.1.   Publishing Is Becoming Pervasive
The economics of the distribution of scholarship in the digital information age has been a core topic for scholarly communication education and outreach programs geared to faculty and graduate students. Yet it is highly relevant to our undergraduate students in their roles as users of content for their educational work and as creators of content. Graduate students, undergraduate students, and many faculty use electronic information tools to share aspects of their professional and educational works in a way that can be defined as publishing, even though it appears to be far removed from traditional publishing in the print world. They are more likely now and in the future to experience content of all kinds as digital, easily available, reusable, and shareable. Students as well as faculty are content creators and content users, shifting between those roles in many aspects of their work. Publishing is no longer the purview of specialists, and the traditional definitions are being challenged. Yet traditional economic models have tended to inhibit the broad access and reuse made possible by digital publishing technologies. The term *publishing* may be too narrow in this context, as our users experience this as the distribution of knowledge and art in many forms and under many business models. However, we will use the term *publishing* in this intersection to cover digital means of dissemination of all kinds of knowledge.

As an essential part of our work with students and faculty on all aspects of information literacy in the digital world, we need to work with our communities to ask and understand the big questions that span the scholarly publishing environment and touch on new ways of approaching teaching. These big questions are:

- How is information in the digital age created and published?
- Who owns this information, who controls it, and who can access it?
- What should we teach about this rapidly changing information environment, and what are the most effective ways to teach it?

Scott Warren and Kim Duckett (2010) elaborate on these questions noting that "As the information landscape continues to grow in complexity, it is becoming increasingly important for students not only to be able to locate and access useful information but also to understand the forces that shape the information they consume." (p. 350)

1.2.   What and Why We Teach About the Economics of Publishing

Scholarly publishing functions as a "gift economy" where authors, peer reviewers, and editors volunteer their labor for the prestige it brings, not for financial remuneration. It is important for us to help students and faculty recognize that most scientific, scholarly, or artistic work done within the academic setting is not undertaken primarily for direct economic profit. Nevertheless, publishers profit from scholarship, and have incentives to limit access, while scholars are more concerned with their work being discovered and valued. Librarians can help students and faculty understand that this information ecosystem inhibits their access to needed materials and limits their ability to control the dissemination of their own work. Scholarly communication programs frequently include workshops and seminars on author rights and copyrights for faculty and graduate students, and information literacy programs frequently focus on how undergraduate students can best discover relevant content, apply it to their work, evaluate it, and cite it properly. Due to the changing economics of publishing, teaching librarians must develop new criteria of quality, since "library owned" is no longer a sufficient determinant of quality, due to the growing amount of high-quality, peer-reviewed, scholarly material free for use.

On the other hand, however, the economic system also creates barriers to access for undergraduate students. Students experience a time of abundant access while they are enrolled as students on campus but more limited access when away, even with remote access technologies. They experience a great loss of access when they graduate. It is thus important to educate undergraduate students about the whole life cycle of information, including the economic frameworks that govern their access while students and the barriers to access they may encounter in other parts of the world or in their careers outside of academia.

1.3.   Transition from Publishing to the "Life Cycle" of Information

For contemporary students in particular, the "life cycle" of information is better described as its "social life." This includes those basic functions facilitated by any scholarly communication system – formation, registration, evaluation, dissemination, preservation, reuse, and subsequent measurement of impact. These functions are still important to each evolving form of scholarly communication, but they are being accomplished through a variety of different channels. Registration can now be accomplished by having a "version of record" on deposit in an author's institutional repository; evaluation can now involve both traditional peer-review and crowdsourced post-publication review. As the Internet allows scholars to

reach much broader and more diverse audiences, this life cycle of research can become a more genuine "social life" for information.

Librarians play a unique role in teaching faculty, graduate students, and undergraduate students about the complete life cycle of information through educational programs geared to different disciplines and levels of student learning. Undergraduates are now likely to be required to work collaboratively on a wiki or to write a blog for a class as the first steps in a writing or research assignment or even as the final product. Librarians who have become more involved with student-run journals find that working with undergraduate students as authors, editors, and publishers is an excellent way to teach about the economic, technological, and legal aspects of publishing, emphasizing the traditional life cycle of scholarly information. Librarians working with graduate students writing their dissertations find opportunities when helping with the copyright questions that arise as the students use the journal articles that they previously published or wonder about reuse of figures from other works.

1.4.   Online Learning and Teaching Materials

The emergence of open online courses challenges traditional models of closed print distribution of educational materials. It also provides an important example of the intersection of concerns about publishing with concerns for new ways of teaching. Open online courses require that content and teaching are merged in new ways, reused, and shared. Even before the development of open online courses, access to and use of materials specifically developed for the educational market have been key areas of intersection between scholarly communication and information literacy. Librarians supporting courses frequently handle questions of copyrights, access, and use of content in the educational setting. The movement to open educational materials provides a rich area for education about open access, Creative Commons licenses, and restrictions of commercial publisher licenses.

1.5.   Technological Disruption to the Economics of Traditional Publishing

Technology has been both a disruptive and an enabling force in the economics of publishing of all kinds of materials, scholarly and educational, and has challenged conventional definitions of scholarship, ownership, and authorship. The traditional perception in academia is that the published item is the ultimate and preferred vehicle for all things scholarly. Today, it is possible to view and interact with multimodal journals (e.g., Kairos, http://kairos.technorhetoric.net/), fieldwork (e.g., Open Fieldwork Project, http://openfieldwork.org.uk/), and lab notebooks (e.g., UsefulChem Project http://usefulchem.wikispaces.com/). The boundaries between disciplines are shifting, allowing for new inter- and multidisciplinary work (i.e., OpenLab, http://openlabresearch.com/) and for new areas of academics, such as digital humanities. The nature of collaboration between scholars and experts is a longstanding, permanent fixture within scholarship. Technology and the resulting push toward openness (e.g., open access, open science, open source, etc.) allow additional voices to chime in to scholarly dialogues. Take, for example, the success of Galaxy Zoo (http://www.galaxyzoo.org/), an open astronomy project in which over a quarter of a million people – experts and amateurs – have provided more than 60 million classifications of galaxies. Another example of crowdsourcing for scholarly purposes is the PolyMath Project (http://polymathprojects.org/), conceived by Professor Tim Gowers in an effort to explore collaboration within mathematics. The end result of the PolyMath Project was a published paper with more than 40 authors. Scholarly communication specialists follow these trends closely, and subject specialist librarians track them in their fields and discuss them with faculty.

1.6.   Publishing as Pedagogy

Undergraduate students are learning and becoming scholars and creators in this new economic and technological publishing environment. The projects described above are examples of creative approaches to new ways of publishing research and disseminating knowledge that make fascinating case studies for undergraduate students to use in their class projects in writing or communications courses. Such examples could be used in information literacy programs as part of class-based instruction to inspire the development of new pedagogical approaches. Publishing as course work is becoming more pervasive, and provides an ideal opportunity for active learning.

> ### *Students and Publishing*
> Students at Macalester College embrace the active involvement required to publish a journal through the course "Engaging the Public: Writing and Publishing in American Studies." The students are responsible for producing an issue for the online journal *Tapestries*: *Interwoven Voices of Local and Global Identities*, published on Macalester College's Digital Commons. "I've always been really interested in reporting and in sharing my writing, so I thought it would be great to work on *Tapestries*," says Lauren Elizabeth Johnson, '13. "It's all about redefining scholarship and using many different avenues to do that." (Macalester College, 2012)

These opportunities in the digital environment require a greater awareness on the part of information seekers, users, and creators of the conditions that underlie the specific information they are seeking and using. The faculty, students, and staff in our institutions play many roles, from seekers to creators. Our teaching programs need to encourage and nurture our students to question the level of expertise employed to review a specific work, and the legal conditions that govern reuse of that work. It is equally important to consider who else has access to this information. If the student is using materials on healing techniques in Nepal, that student should also be wondering if the healer in Nepal can read the same journal article reporting on his work. If the student is working on the impact of mountain top removal in Virginia, the student should also be asking if the local community members have the same access to information about the environmental health impacts. Although these questions have always been important in understanding how scholarship works, the digital environment makes them both more pressing and much more amenable to answers through new models such as open access. We best position our faculty and students to benefit from the changing economics of publishing when we provide collaborative leadership, information, and education on these issues. To do this, we need to build powerful alliances in our libraries between information literacy and scholarly communication expertise, programs, and activities.

Intersection 2: Digital Literacies
Teaching new content formats, and the emergence of multiple types of non-textual content

2.1.   What Is Changing?

In their draft report, the ALA OITP Digital Literacy Task Force defined digital literacy as, "the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills" (2012, p. 1). In its statement of recommendations to governments and organizations, the International Federation of Library Associations and Institutions noted that, "media and information literacy includes all types of

information resources: oral, print, and digital" (IFLA 2011). Comprehending all kinds of content, including data, statistical, financial, and visual, as well as text, is a critical outcome intended by media and information literacy programs.

While it is challenging to consider how best to incorporate digital literacies, such as media literacy, visual literacy, and data literacy, into our educational curriculum, these literacies offer promising teachable moments for issues of ownership, authorship, and copyright. Librarians can collaborate to bring knowledge of these issues together with a deep understanding of student learning in a media-rich, and increasingly social, information environment. Scholarly communication librarians are concerned with dissemination and documentation of all types of content. Information literacy librarians are concerned with helping students and faculty navigate a world where text is no longer the dominant format for communicating ideas. Bringing these areas of concern together could contribute to a deeper understanding of how students learn in a media-rich, and increasingly social, information environment, and would benefit both the information literacy and scholarly communication librarians.

> ### Undergraduate Theses in Institutional Repositories
> The seniors at our liberal arts college look forward to the time when their honors theses are accepted into the institutional digital repository and made publicly available. Their work may involve text, images, sound, and other kinds of material, all integral to their whole work. As part of this rite of passage, they learn to use a Creative Commons license for their work, develop a deeper understanding of the positive impact of open access to scholarly work, and understand firsthand how complex digital scholarship can be. This process, rather than being a tedious requirement, becomes an engaging way to learn about copyright, open access, and digital publishing. When these students go on to graduate school and their professional careers, they are ready to promote new options for access to scholarship and the use of new kinds of information.

Critical thinking and collaborative learning have been central to information literacy, and continue to be core values in teaching new literacies. In the recent past, the solo term paper or other written project was the most common assignment, but increasingly, students are asked to create different types of projects, such as collaborative videos, wikis, or blogs. They may be asked to use digital storytelling techniques to create their final project. Information literacy programs have to address finding, evaluating, using, citing, and creating a much wider range of material types, and include more emphasis on the technological and rights issues of working with different kinds of media. Digital literacies are fundamental to the goal of developing lifelong learners in that they prepare students to be effective and critical users of information in any path they choose to follow after their undergraduate work.

2.2. Data Literacy

Although competency standards and teaching programs for media and visual literacy are focused on undergraduates, key questions about teaching data literacy tend to focus on graduate students and faculty (Carlson, Fosmire, Miller, and Nelson, 2011). These questions center on understanding how to find and evaluate data, the version of data being found and used, who is responsible for it, how to cite it, and the ethics of data procurement. Data literacy is an area where the impact of external forces, ranging from the increasing demand on students to find and use data to funder mandates to have data

management plans, point to a critical area of intersection between scholarly communication and information literacy.

Attention to the development, curation, and interpretation of data has become much more important recently due to an expanding view of what we mean by data. No longer does data refer only to quantitative results drawn from surveys or from scientific experimentation. In the digital environment, text can also become data, as scholars use layers of meta-analysis to seek trends and themes across huge corpuses of textual material. Additionally, numerical results can now be visualized in dramatic ways, and the products of those visualizations also require new approaches for researchers, students, and librarians.

 The role of librarians as teachers in this area is rapidly evolving. Data literacy shares some distinguishing features with media literacy, where the use of tools to use and reuse content in ways not imagined by the content creator are a critical part of this literacy. Ownership and rights issues are core in both of these, and librarians need to be able to address these at all levels of instruction. The same is true regarding issues of access, preservation, and curation, since data collections and representations now can be made available apart from, but linked to, the research publications which are based upon them. Librarians need to be involved in developing ways to handle key issues, such as determining who should have access, how that access can be managed (given the wide variety of formats and technologies involved), and what steps will be necessary to ensure that these data collections remain available over time. Because these decisions have become core to the research process itself, they are precisely a point where scholarly communication and information literacy intersect. Students, both as users and as future creators of data, should be trained to understand how their choices affect access, reuse, and preservation; libraries are better placed than any other academic unit to carry out that training.

The expanding view of data makes data literacy an important part of all instruction of students and future scholars. For example, librarians who specialize in metadata may find themselves engaging in a more explicit teaching function as they work collaboratively on digital scholarship projects, helping faculty understand the metadata needs of their projects. Teaching librarians will also need to develop a deeper understanding of how metadata is created and used to increase the visibility of scholarship in all disciplines.

Humanities and social science scholars represent a new constituency for data literacy education. Humanities scholars are discovering the potential for text-mining and digital representation as research tools, and social scientists are realizing that digital visualizations of their research results can dramatically improve their impact, especially when trying to influence public policy. These researchers need to be trained in techniques of description and preservation and advised about options for providing access to the products of their work. Those who will use the data will need education about how to understand, interpret, and apply what they find. So training in data literacy is not only a rather new field for libraries, but it is one that cuts across disciplinary boundaries and across the traditional structures of academic library organizations.

2.3.   Transliteracy

Transliteracy is an emerging concept that challenges the current structures of information literacy and scholarly communication programs alike. The definition indicates that this is a key area where scholarly communication and information literacy intersect:

> The essential idea here is that transliteracy is concerned with mapping meaning across different media and not with developing particular literacies about various media. It is not about learning text literacy and visual literacy and digital literacy in isolation from one another but about the interaction among all these literacies. (Ipri, 2010, p. 532)

Transliteracy provides us with the new concept that may actually describe the most pertinent types of collaborations librarians with expertise in teaching and scholarly communication issues could develop to serve the needs of the next generation of students and scholars.

The evolving area of digital literacies requires that librarians with expertise in teaching and scholarly communication issues understand each other's domains sufficiently to develop programs and services that forward these new literacies, and help to transform the scholarly communication landscape. We discuss the ways librarians' roles are changing to respond to these needs in intersection 3.

Intersection 3: New Roles for Librarians
The imperative to contribute to the building of new infrastructures for scholarship and to be deeply involved with evolutions in teaching

3.1. Why New Roles
Librarians' roles have been rapidly evolving in response to new initiatives in academic organizations. Notable initiatives for information literacy librarians are online learning, embedding librarians in courses, the "flipped" classroom, an emphasis on assessment, emerging literacies, and a deeper involvement in developing and supporting course projects. Notable initiatives for scholarly communication librarians are open access policies, digital repositories, copyright education and support, and library publishing programs. We explore these threads and the ways they intersect, with a focus on new roles we see evolving to meet the demands of these initiatives.

Changing Roles in Instruction
The recent move by the Graduate School at the University of Washington to open access digital theses and dissertations led to opportunities within the UW Libraries to better educate students on their rights as authors and as the holders of copyright to their work. Before this move, our purpose in working with graduate students on their theses and dissertations was to help them find appropriate resources and cite works properly. Now we are expanding our roles to include interactive discussions about the implications of different access options for their thesis or dissertation, including the default option of having their work be open to anyone on the Internet. All library staff involved in these efforts had to become comfortable addressing the various options available to students and the implications of each option for the student/author. We found that students who were going through the electronic thesis and dissertation process have a greater interest in issues related to publishing, copyright, author rights, open access, and other scholarly communication-related issues. As a result, UW graduate students are better educated about many of these issues and are better positioned to make informed decisions related to their intellectual output.

3.2.   Recent History of Librarian Roles

As we explore intersections between information literacy and scholarly communication, it is worth noting that not long ago, information literacy evolved from bibliographic instruction. Scholarly communication is, by comparison, a very new role. Some libraries have added scholarly communication responsibilities to the job descriptions and portfolios of subject specialist librarians to encourage them to develop confidence and clarity in dealing with these issues, and to influence change through education and outreach about new publishing options such as open access. Traditionally, subject librarians had strong academic backgrounds in the subject areas to which they were assigned, and used that background in running a branch library, developing and managing collections, and providing reference, outreach, and instruction, along with other assignments as needed due to the specific training and talents of the librarian. The subject specialist librarian's role has evolved to include an emphasis on liaison activities, including close involvement with publishing in the disciplines, and with teaching using methods such as active learning, to better engage the 21st century lifelong learner.

3.3.   Requirements for New Roles

In order to integrate the full scope of scholarly communication issues into their work, liaison librarians have to sufficiently understand copyright and fair use, authors' rights, open access, citation metrics (traditional and "alt"), publishing options, digital preservation, and institutional repository development and management. To be effective teachers, these librarians need to be continually refreshing their teaching skills. In the work of many liaison librarians we see a natural intersection of information literacy and scholarly communication, as these librarians are necessarily teaching informally and formally about the changing nature of scholarship and art in the digital world. Specific examples include copy rights education programs targeted to user groups such as graduate students, as well as working with undergraduate teaching librarians to integrate information about reuse of content into their projects.

With this focus on liaison activities and close collaboration with the faculty and students creating content, subject librarians become valuable partners in new initiatives and services. Digital repositories and open access policies are initiatives in which librarians play an important role in managing academic scholarship, and in encouraging faculty and scholars to retain copyrights to their scholarly work. The creation of digital collections through digitization of special print collections also involves close work with faculty. Digital initiatives like these offer an unprecedented opportunity to bring scholarly communication and information literacy librarians together with faculty and students. These programs all benefit from robust outreach and education components, in collaboration with technology experts. Partnerships are vital to achieving success in the new roles librarians now play, and are characteristic of areas of library work where information literacy skills and scholarly communication expertise are both critical components of education and outreach programs.

Exploring our evolving roles has the potential to uncover other intersections and commonalities between scholarly communication and information literacy, and helps us identify strategic responses for librarians. We propose and discuss three such responses in the next section.

Responses to the Changing Environment: Resilience in Libraries

Resilience when faced with a changing environment is critical not only to survival but also to the growth and development of an organization. To achieve this, we need to be willing to practice and model innovation within our organizational structures. Based on our exploration of the above intersections, we find that the scholarly communication and information literacy programs need to converge at many levels of the organization. In this next section, we use the concept of information fluency to elaborate

on new directions, explore ways we can integrate the key issues of scholarly communication into our teaching, and highlight opportunities for collaboration and organizational change.

Toward Information Fluency

Concept of Information Fluency

We use the phrase *information fluency* in this section to describe an intended outcome of deeper collaborations among teaching and scholarly communication librarians. Our use does not imply that we feel *information fluency* is a substitute for *information literacy*, and we are not taking a position on such a substitution. There is a great deal of excellent writing on the topic, such as Mackey and Jacobson (2011). For the purposes of this paper, *information fluency* is used as a term that embraces all of the elements that are included in the theory and practice of information literacy, as well as focuses deliberate attention to the socioeconomic context of knowledge production, the legal situation regarding the intellectual property rights of authors and creators, and critical thinking about the most appropriate platforms and technologies with which to create and distribute new knowledge. Like information literacy, information fluency strives to help all learners incorporate these skills into a lifelong sensitivity to the full scope of knowledge creation, dissemination, use, and impact. The term *fluency* indicates a high level of skills, and ease of practicing those skills. The information fluent person has integrated technological skills, with an understanding of all aspects of finding, using, reusing, and interacting with information and knowledge in the networked digital age, and practices those skills routinely. A recent series of workshops on "Information Fluency in the Disciplines" includes many examples of projects that forward information fluency, see http://www.cic.edu/meetings-and-events/Other-Events/Pages/Infofluency-Workshops.aspx.

Our students consider themselves to be very comfortable using the technology and social media they have grown up with to locate information that they feel is "good enough" for their particular needs. In their world of instant information filtered through personalized social networks, we as academic librarians need to reassess our roles as teachers, what content we present as core, and the intended outcomes of our educational programs. In addition to working with students who come with established habits, we also need to partner with faculty to help students develop new skills and new habits that will lead them to becoming truly fluent in traversing the digital landscape so they can not only access appropriate scholarly resources but understand the production of those resources and create new resources.

Curricula for Information Fluency

Teaching about finding and using information now requires knowledge of how that information was created, who created it, who owns it, and what can be done with it. A key paradigm shift has been the move away from the type of instruction known as "point and click" to a higher level of instruction that guides students to learn not just where to find information, but to think critically about who is producing the information, the economic factors relevant to the information source, and how the restriction of access to information affects the ability to find the most significant materials to address a specific question. Regardless of job title and reporting structure, librarians are teaching in many different settings, whether working with students on creating digital projects such as video, helping them do basic XML mark-up for digitization projects, and working at information desks, as well as in the classroom. This work is more effective when the best teaching skills are brought together with the wide range of content needed to help develop the information fluent student.

To meet this goal, librarians develop programs of instruction that are more fully integrated into the curriculum and include scholarly communication topics. They influence the development of a higher level of learning related to understanding how to evaluate, select the most appropriate resource, and integrate that information into building new knowledge while appropriately acknowledging the work of others. This provides an opportunity to embrace and promote the expertise that librarians have in effective methods of teaching, in subject disciplines, and in the literacies needed for the digital environment, including visual, communication, media, and data. We must fully incorporate our understanding of the changes in scholarly communication that affect the production of art, literature, and peer-reviewed scholarly work. We must include an understanding of the factors that determine access to this work and ultimately the impact of that work. Recognizing as well as demonstrating our unique expertise in these areas should help to emphasize that we have an obligation to help students and faculty become more fluent with digital information. For example, an upper level student in the humanities might need to learn the basics of XML TEI markup because the works studied were digitized using that standard, and the student will expected to use it in graduate school.

As part of deepening our involvement with teaching in the many different settings noted above, we need to contribute to the education of students and faculty about disseminating the results of their work. We no longer are only developing collections and providing access to purchased resources, we are now able to share the intellectual and creative works of our institutions. As part of our response to the new digital environment, we must create new opportunities to make scholarly and creative works available, whether they are individual papers, journals, videos or images, or monographs, in an openly accessible manner using systems created for the purpose of sharing content to the widest possible audience via the Internet. This allows us to further educate students and faculty on the economic, as well as legislative, issues that are affecting scholarly communication. When they learn to make their own work more accessible, they also become advocates for changing the broader system, by, for example, passing student and faculty open access resolutions, and supporting legislation.

To reach the ideal of information fluency among students and faculty, librarians engaged in all levels of instruction need to teach them best practices in the use of copyrighted materials as well as materials that are freely available, and help them understand the conditions of use in licenses. Working with faculty for course materials, for example, or working with students on the appropriate use of digital images on publicly accessibly Web-pages, creates opportunities for us to use our expertise in copyright and licensing. We need to take advantage of "teachable moments" to engage in informal instruction about information in the digital age. We need to communicate about the constraints users may face in accessing and re-using information created by others, and to raise awareness of inequitable access to information globally. As we transition to an even wider variety of electronic formats with great potential for data mining and reuse of content, additional components to the information fluency curriculum will need to be developed by academic librarians, and so our work as teachers will continue to evolve as we focus on what students need for lifelong learning in the digital information environment. This work will move forward more successfully if we build collaborations among information literacy and scholarly communication librarians.

Evolutions in Pedagogy: Integrating Effective Methods into Teaching Scholarly Communication

Incorporating the changing nature of the scholarly communication system into our teaching requires all of us, regardless of job title, to learn and apply the best practices in teaching based on understanding of student learning, using good instructional design and the most appropriate teaching technologies. This

approach produces the most long-lasting results, whether the setting is a first-year undergraduate seminar, a research ethics class for graduate students, or a copyright workshop for faculty. The past decade has seen an increasing focus on undergraduate research, a prime opportunity for librarians to share their expertise and educate the future generation of scholars. Efforts to improve undergraduate education continue to focus on research-based learning opportunities. Teaching librarians can build upon these opportunities by creating experiential learning opportunities for students that explore elements of the scholarly communication process. Students engaged in undergraduate research are not only using the resources that the library provides, they are creating new knowledge. The production of new knowledge is being shared in multiple venues, including research symposiums, student journals, institutional repositories, and professional conferences. Librarians can engage with students in these venues and share their knowledge of the information life cycle in formal and information educational encounters.

The changing landscape of scholarly communication, an increase in the kinds of media formats for creating and sharing information, and changing models of teaching are among the most critical reasons why we need to keep current with new ways of teaching in all our settings. We can no longer expect that only instruction librarians with special training in teaching will forward the library role in education, and librarians with experience in scholarly communication will forward the library's role in the changing nature of scholarship. Best practices in teaching should be shared across these frequently disparate areas. All librarians regardless of job title need to learn, understand, and practice the best approaches to instruction in their many different environments.

Teaching Scholarly Communication Issues

How can librarians teach the complex issues of scholarly communication? Our knowledge of the publication and dissemination process places librarians at the heart of this discussion. As part of the undergraduate experience, students now have more in common with faculty, since they are making discoveries with firsthand knowledge and are increasingly involved in the production of new knowledge and consequently publishing in a variety of formats. By presenting publication and dissemination as part of the information cycle, librarians can help faculty, academic administrative staff, and students gain a deeper understanding of scholarly communication issues such as the economics of scholarly publishing, copyright, authors' rights, open access, institutional repositories, and the management and preservation of scholarly work. This teaching is more effective when active learning, and other ways to fully engage the learner, are applied. Whereas being able to apply copyright law to the most common ways of working with content in higher education was once a matter of applying a set of rules, it is now necessary to help our communities apply critical thinking skills in order to integrate a more fundamental understanding of our copyright regime.

Experiential learning takes advantage of the student's ability to make meaning from direct experiences by actively involving the learner in the experience while presenting opportunities for him or her to reflect on observations and understandings. The facilitating librarian can partner with faculty to create learning opportunities that enhance analytical skills while providing the opportunity to make decisions and solve problems around scholarly communication issues. Guiding students through the publication and dissemination process gives them a sense of personal investment in the process that allows for a deeper understanding of complex issues that the student can continue to apply in graduate school or professional experiences.

> *Copyright Education: Evolution from Learning Rules to Critical Thinking*
> In many academic institutions, a large component of copyright information transmitted to users is about the rules or guidelines established to determine the amount of material to put on course reserve. Users and library staff have come to see these guidelines as copyright law, and at the same time they do not learn about the aspects of the law they should apply, such as fair use. However, ideas about how best to apply copyright law to the use of materials in the academic environment have evolved a great deal. The ways this is taught need to evolve along with new thinking about the importance of exercising fair use and teaching students to be critical thinkers about the use and reuse of content. The Code of Best Practice for Academic and Research Libraries (ARL et al, 2012) provides a powerful impetus for organizations to apply active learning concepts to the teaching of copyright. This code can be used to teach principles and to help librarians, faculty, and students practice applying these principles to typical cases in academic libraries. Rather than "teaching the code" in a traditional lecture manner, each library department or committee whose work is affected by the code could be encouraged to discuss and present specific applications of the code to their work.

Specific Activities for Teaching Scholarly Communication Issues Using Creative Teaching Techniques and Technologies

The following are select strategies for creating learning opportunities that are applicable to teaching scholarly communication issues, either as integrated into course curricula or as part of a separate series of workshops on topics like open access and copyright:

- create opportunities where students can gain knowledge from peers and their environment;
- adopt the "flipped" classroom model, with more material provided to the students outside of the classroom, and more classroom time for engaging with the material;
- construct activities that work with various learning styles, such as using immediate response via clickers;
- develop tutorials and self-guided instruction modules;
- create an environment where students can build upon their previous experiences and current projects, while gaining more firsthand knowledge in order to acquire and test new knowledge. Be sure to include time for exploration, thinking, and reflection;
- librarians should be the mentor in the learning process while students are encouraged to be self-directed learners since decisions regarding scholarly communication will be made on a case-by-case basis.

Additionally, librarians can facilitate conversations about scholarly communication issues through a multi-prong approach that includes:

- incorporating discussion of scholarly communication issues into course-integrated and one-shot sessions;
- reaching out to formal undergraduate research programs where faculty are paired one-on-one with undergraduate students;

- developing presentations (at varying degrees of depth) for research groups, faculty meetings, and graduate student meetings;
- creating online instructional material aimed toward different audiences;
- participating in the organization of campus symposiums and conferences;
- teaching open workshops that address scholarly communication issues and marketing those sessions to campus groups;
- partnering with your campus research board.

Students Learn About Publishing

Illinois Wesleyan University, a small private liberal arts college, involves students in all aspects of publishing the Undergraduate Economic Review (UER), a born-digital, open access journal that publishes excellent undergraduate research in economics from all over the world. Reviewers and editors are given an orientation to scholarly publishing, including a primer on author rights, the economics of publishing, open access, and how the UER contributes to progress in these areas. The faculty advisor, student editor-in-chief, and scholarly communication librarian work together to develop and deliver the orientation and follow-up activities.

Students' larger Web lives lead them to broad generalizations and misunderstandings regarding issues such as copyright. Librarians should engage assessment techniques (e.g., worksheets, portfolios, rubrics) that will reveal an understanding of the issues that students face during the publication and dissemination process. Teaching librarians can also survey and interview students to gauge their evolving understanding of scholarly communication issues. Collaborating and consulting with scholarly communication librarians will help the teaching librarian to develop instructional material suited for a variety of constituencies.

Embracing effective and appropriate technologies and teaching techniques for scholarly communication issues is essential in the current changing digital information environment in which our students and faculty operate.

Opportunities for Collaboration and Changes in Organizational Structures

Librarians' evolving roles in response to new initiatives in academic organizations were explored in our third intersection, and the benefits of greater collaboration are woven through all of the intersections. Both scholarly communication and information literacy programs thrive only when the librarians involved are actively collaborating across campus, through involvement with teaching centers, publishing and grant support offices, and close communication with deans and provosts, as well as individual faculty.

Here we propose that a key response to the changing environment includes deepening all of these collaborations and developing new roles and organizational structures within our libraries that encourage and reward such collaborations. We see changes in roles exemplified by new job titles and job descriptions, and the inclusion of scholarly communication into the guidelines for liaison librarians; for example, guidelines at the Dartmouth College Library now include statements such as "Educate and inform faculty, graduate students, undergraduate students, and campus administrators on issues of

scholarly communication. Be a resource for issues such as scholarly communication, open access, institutional repositories, and digital collections" (Dartmouth College, 2012).

Changes in organizational structures are underway in many organizations at all levels, but they are not always well recognized. Nevertheless, they are often necessary responses to new opportunities in the digital environment. Organizational structures are evolving from our traditional structures of public services and technical services, particularly in the development of information literacy directors and scholarly communication positions.

> ### Cross Campus Collaboration and Organizational Change
> In the fall of 2009, faculty, staff and students at Parkland College gathered for a series of discussions about the role of scholarship at a community college and how we at Parkland demonstrate scholarship. Using Ernest Boyer's paradigm, as outlined in *Scholarship Reconsidered:Priorities of the Professoriate* (Boyer, 1990), we easily identified many examples of scholarly and creative work on our campus. It then became obvious that Parkland had no centrally located mechanism for preserving, sharing, and showcasing all of this scholarly and creative work. In order to meet this need, in 2010 we developed an institutional repository (IR), SPARK: Scholarship at Parkland (http://spark.parkland.edu). SPARK is one of only a handful of community college IRs in the country, and has already earned both statewide and national recognition for innovation at the community college level. At Parkland College, SPARK is facilitating a deeper understanding of student success, reinforcing high expectations for student achievement, and fostering a college-wide dialogue about scholarship and scholarly communication.

Parallels between the mainstreaming of information literacy and scholarly communication in libraries serve as useful models for organizational change. In the early 1990s, the concept of scholarly communication became part of the library vernacular, coming years after information literacy developed out of bibliographic instruction as a core aspect of library responsibilities. (For a visualization of the timelines, see Palmer and Gelfland, 2011). Scholarly communication first grew out of concerns about proliferating costs of information. As libraries perceived that they were buying back at unsustainable prices the scholarly outputs of their faculty, the scholarly communication movement was born to address the range of relevant issues. Having a separate scholarly communication position may not be possible at many institutions, and even where these exist it is critical to have a strong integration with the much more established educational program at all levels. We find new models in those librarians whose responsibilities currently lie in both areas as we witness how they blend their roles and integrate scholarly communication concerns into the classroom.

The big challenge for librarians is how to capture and respond to the vitality of the intersections between information literacy and scholarly communication while accounting for disciplinary differences and larger trends. Academic library administrators are creating new structures and systems within library organizations to incorporate scholarly communication issues in much the same way that our profession transitioned from an earlier generation bibliographic instruction model to a more sophisticated information literacy model, with outcomes and assessments developed as part of the instructional design. Librarians are again expanding their roles and expectations, focusing on

technologies and the affordances they offer to experienced and novice scholars, faculty and students alike. This paper asserts that the transformation of the roles of academic librarians will be most effective and most powerful when we weave together information literacy and scholarly communication, integrating the two into new services within our professional practice. In turn, organizational structures need to support this direction.

We acknowledge that academic libraries function within a wide range of types of institutions and have many different organizational structures. We recognize it may prove challenging to move beyond a sense of clear lines, division, and duality. We realize that many academic librarians, ourselves included, often start with the framework "the bulk of my work as a librarian focuses on *either* information literacy *or* scholarly communication." Our organizational structures are still deeply grounded in divisions of public services and collections services, with scholarly communication developing from collection services and information literacy developing from public services. We assert that, as a profession, academic librarians need to move to a sense of interconnectedness, with its inherent ambiguity (for some). We not only see but encourage the view that "My work as a librarian is shifting to encompass *both* information literacy *and* scholarly communication." While this integrated view is beginning to be adopted within the profession, it needs to become a widespread norm.

Recommendations

After articulating these intersections and exploring responses that will help make libraries resilient in the face of the changing scholarly information environment, we identified the following objectives and actions in alignment with the responses discussed in the paper. In some cases, we suggest organizations best suited to forward these ideas, and in all cases, we encourage further conversations about all of them.[1] These are far from the only possibilities, so encourage your libraries, committees, and organizations to build upon and add to these.

1.) Integrate pedagogy and scholarly communication into educational programs for librarians to achieve the ideal of information fluency.
   a) Develop specific opportunities with the ACRL scholarly communication workshop and the Information Literacy Immersion Institute with a special emphasis on teaching about scholarly communication issues, including open access, author rights, copyright, and fair use. *Key organizations*: ACRL, ARL, and other academic library professional development organizations
   b) Explore and develop model instruction that integrates topics such as authorship, ownership, and use of content, from the first year seminar through graduate student workshops. Encourage all librarians to take advantage of opportunities to develop teaching and outreach practices and skills. *Key organizations*: individual library leadership
2.) Develop new model information literacy curricula, incorporating evolutions in pedagogy and scholarly communication issues.
   a) Redesign information literacy curricula to include topics such as authorship, ownership, and use of content, from the first year seminar through graduate student workshops. *Key organizations*: ACRL, individual libraries
   b) Support the review and revision of Standard Five of the ACRL Information Literacy Competency Standards for Higher Education with the goal of strengthening the standards, performance

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[1] This white paper is issued as both a PDF and in an interactive format, available at http://acrl.ala.org/intersections. We hope readers will add comments and reactions there.

indicators, and outcomes for scholarly communication issues. *Key organizations*: ACRL, individual libraries

3.) Explore options for organizational change.

a) Seek out and share organizational models that break down barriers between information literacy and scholarly communication programs and librarians in order to strengthen our response to the changing needs of students and faculty. *Key organizations*: individual library leadership

b) Offer support for exposure and training in the best practices in teaching so these are made available to all librarians, whether assigned scholarly communication or information literacy as their major role. *Key organizations*: individual library leadership

4.) Promote advocacy

a) Engage at all levels of our organizations and institutions in discussions of the values held by scholars and librarians for broad dissemination of scholarship and student learning to become scholars. *Key organizations*: ACRL, other academic library organizations, individual library leadership

b) Articulate the value librarians bring to the academic enterprise and the individual when we forge deeper collaborations around the intersections of information literacy and scholarly communication. *Key organizations*: ACRL, other academic library organizations, individual library leadership

Conclusion

The need for librarians and library organizations to observe carefully and think deeply about the changing scholarly information environment and its impact on our roles in further developing information fluent communities and reforming the current scholarly communication ecosystem is compelling. Adaptations in both of these areas are necessary for us to support the success of our students and faculty in the dynamic digital environment of contemporary teaching, learning, and scholarship.

Our organizational structures must be flexible enough to optimally support the intersections in the two key areas of librarianship discussed in this paper, information literacy and scholarly communication. We will have accomplished the goal of this white paper if it generates conversations at all levels in academic libraries and at professional conferences about ways librarians can embrace new roles and work across traditional boundaries to prepare students, faculty, and administrators to take full advantage of the dynamic digital environment for scholarship and teaching.

Appendix A: Working Group Members

The following people served on the working group and contributed to the writing of this white paper:

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Appendix B: Process for Developing this White Paper

The concept of a white paper to articulate the impact of the intersections of scholarly communication and information literacy on the work of academic librarians emerged after discussions in ACRL meetings, within committees, and across committees. More than four years ago, members of the ACRL Scholarly Communications Committee identified a need to "mainstream" scholarly communication – that is, to declare these issues as central to the profession and fully own them –and developed education programs for all academic librarians to better prepare them to engage with appropriate activities on their campuses. Much of the "mainstreaming" conversation centered on liaison work in particular, and many liaison librarians are also teaching librarians.

Shortly after those conversations began, ACRL formed the Information Literacy Coordinating Committee. The Information Literacy Immersion programs continued to evolve as models of professional development to keep librarians current with changing expectations in higher education. At the same time the ACRL scholarly communication workshop provided professional development on these topics. Members of these committees realized that there were areas where collaboration would enhance their respective work. Early conversations centered on these four guiding suppositions:

1.) To be information literate in the digital age, students need to know the whole cycle of scholarly communication, and issues such as copyright, author rights, use and reuse of digital information objects, etc., need to be more fully integrated into undergraduate and graduate student information literacy program curriculum. This supports students as creators of content.
2.) To support this integration of scholarly communication issues into information literacy programs, librarians who focus their work on scholarly communication issues should partner to provide materials and assistance in curriculum development.
3.) Librarians involved in teaching about scholarly communication issues coming from collection development areas may not have had a background in teaching techniques and could benefit from the knowledge and experience gained by librarians for whom teaching is a key responsibility.
4.) There are useful parallels in the incorporation of information literacy as a recognized professional competency in the minds of the library community and the similar widespread adoption of scholarly communication outreach and program development as core to the profession.

As a next step to move these conversations ahead, and in response to a request made during an ACRL Scholarly Communications Discussion Group, the ACRL Scholarly Communications Committee, with co-sponsorship of the ACRL Information Literacy Coordinating Committee, presented a session called "Global trends and local actions for liaison and teaching librarians to support changes in scholarly communication" at ALA Annual Conference 2011. During this well attended and high-energy session, we discussed the changing demands on librarians and examined how scholarly communication issues, such as open access, copyright, media literacy, and data management, are becoming important for liaison and teaching librarians.

Building on the momentum, Joyce Ogburn, then vice-president of ACRL, suggested we convene a working group to discuss the concepts and determine if a "white paper" would be the right vehicle to communicate more broadly. Meanwhile, others were writing and speaking on excellent examples of intersections, and outlining parallels in the development of scholarly communication programs in

libraries to the development of information literacy programs in libraries. Ogburn's column in ACRL's *C&RL News* "Lifelong Learning Requires Lifelong Access" (Ogburn, 2011) provided us with the focus and support needed, as our concerns were also major strategic areas for ACRL. So with support from ACRL, then-chair of ACRL's Scholarly Communication Committee, Barbara DeFelice, carefully assembled a group of thought leaders within ACRL who are drawn to this way of conceptualizing a significant frontier of academic librarianship. We shared our ideas and developed plans for taking action. One of those action items is this white paper.

Each member of the working group contributed to the writing of this white paper. As part of the process for reviewing and vetting drafts, we asked member volunteers in a few key ACRL groups to provide their reactions and feedback, which we integrated into the final paper as appropriate. Those groups were the Student Learning and Information Literacy Committee, the Research and Scholarly Environment Committee, and the Instruction Section Executive Committee.

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