The Enlightenment of Peer Review: How Academic Librarians Can Utilize Open Peer Review Methods to Advance Information Literacy

Sandra Moore

Word Count (excluding references): 5975

Abstract

In today's world of digital scholarly publishing, it is increasingly clear that movements such as open access (OA), Open Science, and open peer review (OPR) are increasingly impactful and gaining momentum. The shift towards openness in the academy reveals a transformation of traditional structures that compose scholarly communication as well as changing attitudes about the nature of authority and access within these systems. These new directions in the scholarly information landscape have created a need for academic librarians to realign roles and respond in ways that build resiliency in an era of rapid change. Recognizing that many core elements of scholarly communication are powerful tools for teaching students about information literacy can lead to transformative instructional strategies. This paper explores how academic librarians can leverage the innovative traits of OPR to advance information literacy through experiential student learning opportunities grounded in the ACRL (2016) Framework for Information Literacy for Higher Education*.*

Keywords: open peer review; scholarly communication; academic librarians; information literacy; ACRL Framework

Moore, S. (2020). The enlightenment of peer review: How academic librarians can utilize open peer review methods to advance information literacy. *Emerging Library & Information Perspectives, 3*, 9-38. https:/doi.org/10.5206/elip.v3i1.861

Introduction

In today's world of digital scholarly publishing, it is increasingly clear that movements such as open access (OA), Open Science, and open peer review (OPR) are increasingly impactful and gaining momentum. The shift towards openness in the academy reveals a transformation of traditional structures that compose scholarly communication as well as changing attitudes about the nature of authority and access within these systems. Michael Jensen (2007), director of strategic web communications for the National Academies Press, states that publishers must take seriously their "role in deciding not just what material will be made available online but also how the public will be allowed to interact with the material. That requires a whole new mind-set" (p. 306). By drawing attention to the idea that online scholarship creates new opportunities for interaction, Jensen highlights the emerging participatory and open nature of knowledge production and dissemination.

These new directions in the scholarly information landscape have created a need for academic librarians to realign roles and respond in ways that build resiliency in an era of rapid change. One common theme emerging across organizations is the need for collaboration, especially between those with information literacy roles and those tasked with supporting scholarly communication services. As librarians become increasingly aware of the potential for integrating these two dynamic areas, the need for effective tools, strategies, and initiatives grows more apparent.

In a 2013 white paper, *Intersections of Scholarly Communication and Information Literacy*, the Association of College and Research Libraries (ACRL) notes the changing nature of librarianship and "asserts that the transformation of the roles of academic librarians will be most effective and most powerful” when these two areas of professional practice are woven together (p. 20). By integrating scholarly communication topics into other library services, such as information literacy instruction and outreach, academic librarians can effectively nurture information fluency and advance institutional goals. Peer review, in particular, can lead to transformative instructional strategies when tied to the ACRL’s (2016) *Framework for Information Literacy for Higher Education* to “extend learning for students” and nurture collaboration with faculty (p. 7). This paper explores how academic librarians can leverage innovative OPR models to advance information literacy by incorporating them into experiential student learning initiatives. A brief examination of how student-run journals provide collaborative learning opportunities incorporating scholarly communication topics is followed by a comparison of peer review methods. Additionally, this paper explores how OPR models can effectively implement the ACRL (2016) *Framework*, with a particular focus on “Authority is Created and Contextual,” “Information has Value,” and “Scholarship as Conversation.” A final call to action includes specific examples of how academic librarians can provide ongoing leadership in this area.

Peer Review and Experiential Learning

Information literacy instruction commonly focuses on teaching students how to find, access, and cite peer reviewed literature—the “what” of peer review. A brief exploration of library research guides and tutorials from post-secondary institutions confirms that peer review is most often presented as an activity “done by experts” or “referees” with the gatekeeping and quality control aspects emphasized. For examples, see research guides from the following institutions: University of Toronto (n.d.)

(https://guides.library.utoronto.ca/peer-review); Harvard Library (n.d.) (https://guides.library.harvard.edu/SLS19/Scholarly); Mount Saint Vincent University (n.d.) (https://libguides.msvu.ca/help/scholarlypublishing). While this information is important, revealing how scholarly communication is traditionally produced, it tends to hold students at a distance, relegating them to the position of passive consumers of peer reviewed literature which is produced and judged by "experts" in the academy. Yet, the ACRL (2016) *Framework*, drawing upon the concept of "metaliteracy," suggests "the renewed vision of information literacy [involves] an overarching set of abilities in which students are consumers *and creators* [emphasis added] of information who can participate successfully in collaborative spaces" (p. 8). Examining peer review through this lens reveals both the need and the potential for comprehensive and experiential student learning initiatives.

Student-Run Journals and Peer Review

As more universities and programs of higher education recognize the value of experiential learning opportunities for students, academic librarians can design contextual initiatives aligned with these strategic missions. For example, the emergence of the student-run journal, often published as a collaborative partnership between libraries, faculty, and students, is one platform to explore scholarly communication in hands-on ways. There are various models of student-run journals described in the literature encompassing a broad disciplinary scope. Some journals provide opportunities for students to be authors and peer reviewers, while others engage students in editorial roles and the management of publishing processes, or some combination of the above. Student-run journals may also be embedded into specific courses or implemented as core components of degree programs. These types of journals often function as the primary means of teaching students about scholarly communication in speciality programs such as law schools, where the student-edited law review is a long-standing tradition. All of these models involve students in experiential capacities, often with support from academic librarians or library writing centres, to develop knowledge and understanding of scholarly communication topics, including the peer review process.

Students as Editors

Student-edited journals provide ongoing opportunities for immersion in the complex process of scholarly publishing across different disciplines. Dawson and Marken (2019) highlight the many benefits of involving students in editorial roles in the *University of Saskatchewan Undergraduate Research Journal*, including a broad spectrum of "highly transferable communication, writing, editing and critical thinking skills" (p. 275). Witnessing peer review from a different perspective, student editors must learn to diplomatically communicate review reports to authors, including critical reviews, rejections, and revisions (Dawson & Marken, 2019, p. 274). They help authors revise papers and prepare articles for publication, often working with a larger editorial team, developing skills of collaboration and teamwork (Dawson & Marken, 2019, p. 275). Student editorial teams also gain an intimate understanding of how to work with digital publishing systems, how to publish an article in a scholarly journal, and how scholarly publications contribute to the research community (Dawson & Marken, 2019, p. 276).

Some student-edited journals are aligned with core academic objectives contributing to the overall institutional mission. For example, the Master of Arts in Language Studies (Léann Teanga) program in the National University of Ireland, Galway, established a student-led journal (*Leann Teanga: An Reiviú*) as a core element of the degree. This initiative allows students to actively engage with the academy and with the “theoretical knowledge they [have] mastered” (Uigin et al., 2015, p. 63). By intentionally recruiting expert faculty reviewers, the student editors expanded their knowledge of how peer review is conducted and gained insight into the academic and professional world in a context of practice.

Another example of student editorial involvement in scholarly publishing processes includes the student-edited law review. These traditional forms of legal scholarship offer student editors a rigorous venue for the development of their “keen attention to detail…as they check citations for substance and form and determine whether written statements are accurate” (Garvey Algero, 2017, p. 383). Although not a formal peer review process, the role allows students to interact with articles submitted by professional judges, lawyers, and professors, challenging them to become better writers, thinkers, and lawyers (Garvey Algero, 2017, p. 383). In each of the above examples, students gain unique skills managing the “business” side of a journal, through recruiting and communicating with expert reviewers in specialized disciplines.

Students as Authors and Peer Reviewers

Some journals give students opportunities to become published authors and conduct peer reviews. Shuttleworth et al. (2019) offer a detailed look at two embedded “course journal” models from Simon Fraser University. In these examples, students contribute articles and conduct peer review themselves, “gaining firsthand experience in establishing credibility through expert review by participating in the review process” (Shuttleworth et al., 2019, p. 4). These course journal projects create opportunities for "peer learning," described as a "social constructivist approach which focuses on students learning from one another in purposefully collaborative environments" (Shuttleworth et al., 2019, p. 8). Being involved directly in peer review activities allows students to learn how to give and receive constructive feedback, and how to incorporate revisions in order to strengthen the work.

Another innovative example of a journal that utilizes student peer reviewers is the *International Journal of Exercise Science* (IJES). The stated mission of this journal is "to engage student researchers, to provide an outlet for peer-review and possible publication of their work, and to grant an opportunity for them to gain experience as peer-reviewers" (Stone et al., 2018, p. 1). Incorporating detailed peer review training and evaluation rubrics, the IJES develops students' capabilities to conduct valid and reliable assessments of articles submitted by their peers. In fact, a further study revealed that these student reviewers were just as stringent in their evaluations and final decisions as established faculty reviewers, providing evidence of the effectiveness of formal peer review training and the capabilities and competencies of student reviewers (Navalta & Lyons, 2010, p. 173).

As a third example, the *European Journal of Legal Studies* is a departmental legal journal supported by faculty, and it "contributes to training young scholars in peer review and other journal related activities" (Xenidis et al., 2017, p. 1). This journal focuses on involving young researchers in the peer review process in order to develop a "toolkit of crucial analytical and organisational skills which will prove helpful in their future academic career" (Xenidis et al., 2017, p. 2). These examples illustrate how students can learn the rigors of writing, reviewing, and knowledge production in a supportive community.

The Effectiveness of Experiential Learning

These types of immersive situations give students experience in both the mechanics of publishing and the complex scholarly communication landscape. By positioning learning within a real scholarly process, students deepen their understanding of how the academic community creates and shares knowledge. In a library and information science (LIS) context, preparing students to work within the modern scholarly ecosystem is a valuable endeavour, yet one that is often overlooked. Seelye et al. (2019) noted “very few ALA [American Library Association]-accredited MLIS [Master of Library and Information Science] programs regularly offer a course solely dedicated to scholarly communication” which leads to a “significant burden on early career librarians with scholarly communication responsibilities” (p. 502). In contrast, MLIS programs that offer experiential learning opportunities allow students to become better prepared for their future careers and research endeavours by effectively “situating this work within a critical library and information science framework” (Seelye et al. 2019, p. 503).

The idea of learning through “situations” is described by Brown et al. (1989) as a “cognitive apprenticeship that embed[s] learning in activity and make[s] deliberate use of the social and physical context” (p. 32). The importance of knowledge being intricately tied to its use in a cultural context helps explain the effectiveness of experiential learning. As Brown et al. (1989) state,

> Unfortunately, students are too often asked to use the tools of a discipline without being able to adopt its culture. To learn to use tools as practitioners use them, a student, like an apprentice, must enter into that community and its culture. (p. 33)

Rather than remaining passive consumers of scholarly information, student-run journals allow novice learners to enter the culture of the academy and become active content creators and hands-on participants in publication processes.

Offering students opportunities to contribute their talents and develop their abilities as editors, authors, and reviewers is a highly effective way to facilitate the development of integrated literacy abilities. While these types of initiatives have had a transformative effect on information literacy, providing in-depth experiences in scholarly communication, traditional blind peer review practices are commonly employed. As such, they are missing the potential that OPR models offer to implement the ACRL *Framework* and develop advanced information literacy abilities.

An Exploration of Peer Review Models

As part of a broader paradigm shift within scholarly communication, the essential process of peer review is currently experiencing a “revolutionary phase” alongside the open access and Open Science movements (Tennant et al., 2017, p. 7). As such, academic librarians must remain aware and knowledgeable of innovations in peer review models, which have significant implications for researchers and students. Duckett and Warren (2013) note:

> Librarians are well-positioned to provide the bigger picture of how academic information is created, vetted, distributed, stored, and accessed. In academia

> [they] are usually the most knowledgeable experts on these topics and often the only ones who see the larger context. (p. 29)

With specialized knowledge of the practices and processes essential to the production of peer reviewed literature, librarians are especially well-suited to leverage emerging OPR models as tools for information literacy. By taking a brief look at some limitations of blind peer review, the potential benefits of using innovative OPR models to enhance literacy can be better envisioned.

Limitations of Blind Peer Review

Traditional peer review has been established for decades and is the accepted “golden standard” for determining value and quality in scholarly works (D’Andrea & O’Dwyer, 2017, p. 1). As Kathleen Fitzpatrick (2010) notes, “it is hard to imagine a future without it, or any way that it could conceivably change” (p. 166). Being peer reviewed suggests that research has been subjected to scrutiny by experts in the field and vetted in such a way that it becomes authoritative and worthy of respect and influence (Fitzpatrick, 2010, p. 162). However, despite this privileged status, problems inherent in blind review models have been well documented, such that “the status and purpose of peer review is often contested” (Tennant et al., 2017, p. 2). Studies have demonstrated that traditional peer review processes are prone to reviewer and editorial biases as well as wastefulness of academic work.

Potential for Bias and Elitism in Blind Peer Review

Originally implemented as a corrective response to reviewer bias, typical blind peer review practices operate in an opaque environment controlled by publishers and editors with the identity of the authors and reviewers hidden before reviews are conducted. However, in the digital age many have noted that identity masking is futile, as researchers often visibly promote their work through social media, informal networks, and conferences within specialized disciplines (Godlee, 2000, pp. 74–75). Furthermore, blind peer review does not eliminate intellectual bias, which Fitzpatrick (2010) describes as reviewers “dismissing any arguments or conclusions that disagree with [their] own” (p. 169). Different types of peer review bias can be summarized as a “violation of impartiality in peer evaluation” (Lee et al., 2013, p. 4). Conflicts of interest with the research can lead to reviewer recommendations to delete outcomes, modify the communication of findings, or deny publication outright (Haffar et al., 2019, p. 671). In addition, editorial decisions to accept a paper based on the country of origin, institution, or reputation of the author can lead to elitism, racism, and other unjust practices, which are hard to detect within a closed, blind system (Bali, 2015, p. 861; Haffar et al., 2019, pp. 671–672). Furthermore, as Ford (2018) commented on blind peer review, “the majority voice, then, becomes amplified stifling other minority voices” (p. 13). Taken together, the “black box” nature of closed review systems can lead to an atmosphere of distrust and elitism misaligned with values of collaborative knowledge creation and open scholarship (Smith, 1997, p. 759). The ACRL frame “Information has Value” encourages students to “understand how and why some individuals or groups of individuals may be underrepresented or systematically marginalized within the systems that produce and disseminate information” (ACRL, 2016, p. 16). Examining blind peer review through this lens reveals that it is not always the best way to conduct this important aspect of scholarly communication.

Wastefulness in Blind Peer Review

In addition to potentiality for bias, blind peer review systems have been criticized for wastefulness and lack of reward for reviewer time and effort. When a manuscript is rejected by one journal, after weeks or months of editorial and reviewer deliberations, authors will often resubmit to another publication leading to what is termed the "waterfall" problem where individual articles go through multiple cycles of review and rejection (Ross-Hellauer et al., 2017, p. 1). Moreover, by keeping peer review behind closed doors, the potential for authors, junior researchers, and students to engage with and benefit from constructive criticism is removed. These issues contribute to a wasteful system that keeps potentially useful information and scholarship disconnected from those who could benefit from it.

Furthermore, blind peer review requires copious amounts of work contributed by multiple reviewers, resulting in academic output that is neither compensated nor formally recognised. Schmidt et al. (2018) reported that "a recent survey of almost 3000 reviewers found 4 in 5 agreed peer review is insufficiently recognised and that reviewers would invest extra effort if review activities were formally acknowledged" (p. 4). The ACRL frame "Information has Value" highlights the disposition that "learners value the skills, time and effort needed to produce knowledge," suggesting that the formal recognition of peer review is an important way of "confirming the rights and responsibilities of participating in a community of scholarship" (ACRL, 2016, pp. 16–17).

Imposing traditional blind peer review as "the method of choice" in all contexts leads to a reinforcement of the "gatekeeper" role, perpetuating elitism and excluding minority voices. When peer review practices are kept behind closed doors, students and junior researchers, who are constantly required to find, read, and cite peer reviewed literature, are prevented from understanding and contributing to this foundational aspect of academic culture. Additionally, since blind peer review reports are usually only read by editors, the valuable scholarly work involved in the review process is left undervalued and unrewarded, contributing to a wasteful and burdensome system.

Defining OPR Models

In contrast to traditional closed systems, emerging OPR models are described in different ways by various scholars. Tony Ross-Hellauer (2017) defines OPR as an umbrella term applied to peer review models that align with the aims of Open Science (p. 1). Identifying various configurations of seven core traits, Ross-Hellauer (2017) revealed “a number of overlapping ways that peer review models can be adapted” (p. 1). There are two main characteristics common to most OPR models: “open identities” whereby authors and reviewers are known to each other and “open reports” whereby the results of the reviews are made public alongside the relevant article. Additionally, there are other features that are often included in OPR practices, such as “open participation” through which the wider readership is invited to participate in the review process; “open interaction,” which allows visible and direct reciprocal discussion between authors and reviewers or between reviewers themselves; and “open pre-review manuscript” or “open final version commenting”, which allow feedback to take place during different stages of the publication process. Finally, “open platforms” or “decoupled review” is when the peer review process is conducted by a different organization than the venue of publication (Schmidt et al., 2018, p. 3). “Soundness only” peer review is another practice that has been widely implemented in open access mega journals such as *PLOS ONE* and *Scientific Reports*. In this model, articles undergo an initial screening for rigor before being published and made open to the community to provide judgement on novelty, significance, and relevance (Spezi et al., 2018, p. 138). Together, OPR traits and models can be combined in a myriad of ways, often overlapping and complementary, illustrating their inherently flexible nature and applicability to diverse scholarly communities with different disciplinary needs.

Benefits of OPR models

Two of the most obvious benefits inherent in OPR practices are greater transparency and accountability (Schmidt et al., 2018, p. 4). When reviewer comments are visible and biases, criticisms, and controversial ideas are addressed openly, conflicts of interest become apparent and editorial selection of reviewers can be subjected to scrutiny. Journals that follow rigorous inclusive practices can be distinguished from those which may be perpetuating entrenched power structures or “privileging certain voices and information” through unfair rejection and vetting decisions (Donovan & O’Donnell, 2013, p. 8). When peer review reports are published alongside original articles (open reports), researchers and students benefit by learning what constructive feedback looks like, how to respond to critique in professional ways, and how the practice of peer review can actually strengthen or improve a work. OPR models that promote transparency and accountability are aligned with best practices and values of emerging open scholarly systems, such as those recommended by the Directory of Open Access Journals (n.d.).

Additionally, OPR can provide incentive and reward for the effort and hard work of the reviewers themselves. With over two million research articles published each year, there is considerable burden placed upon scholarly communities to provide adequate review (Tennant, 2018, p. 2). By incorporating openness into review practices, the discoverability and usability of the work is enhanced, allowing review reports to become citable and creditable research outputs. Recently, in response to requests from the academic community, the association Crossref began assigning DOIs to peer reviews, referee reports, decision letters, author responses, and community comments, which can now be listed on CVs and ORCID profiles (Crossref, 2018). The formal recognition of peer review outputs incentivizes reviewers to invest extra effort, especially if their work has the potential to be acknowledged in research assessments and/or funding and promotion decisions (Schmidt et al., 2018, p. 4).

Challenges to OPR

Despite being called “an increasing trend,” OPR is often met with resistance in the academy, consistent with the slow uptake of green and gold open access (Tennant et al., 2017, p. 2). Even within the field of LIS, Ford (2016) discovered in a survey of LIS journal editors that “conversations about OPR in LIS publications have not been widespread” (p. 13). Tennant (2018) describes this as “cultural inertia” whereby innovative or potentially disruptive systems and processes must demonstrate empirically that they are better than more familiar and accepted ways of doing things. Yet, with scholarly traditions and systems of prestige firmly entrenched at institutional levels, there is often little incentive for users to engage in alternative processes.

Another criticism of OPR suggested by some scholars is that opening up comments to a wider readership might allow all manner of “junk, voodoo and quackery to flood the literature” and that public opinion would be allowed to override academic and scholarly authority leading to a loss of power and prestige (Shatz, 2004, as cited in

Fitzpatrick, 2010, p. 163). This misunderstanding of the nature and role of OPR traits reflects a broader lack of familiarity with the ways in which transparent scholarly discourse can filter and refine the knowledge and ideas being presented (Fitzpatrick, 2010, p. 164). For example, open participation is often implemented as a parallel complement to solicited expert reviews, effectively broadening both the scope and number of reviewers. This can open doors for under-represented perspectives such as special interest groups, industry specialists, and—in the case of medical reviews—patients, to provide highly valuable feedback (Ware, 2011).

Further, many concerns about opening review models centre around issues of who exactly has the authority in OPR, how technology platforms need to be adapted to allow for open participation, and whether scholarly communities perceive journals who embrace OPR as authoritative (Ford, 2016, p. 4). These are valid concerns reflecting the need for further development of the models; however, as Ford (2016) states, "many see OPR as part of an open publishing ethos, [and] as a way to battle inherent problems in the scholarly peer review system" (p. 4). Awareness of these challenges highlights the need for increased implementation of OPR methods, providing interesting opportunities for academic librarians and researchers to explore, as well as offering further incentive to experiment with these models in information literacy instruction.

Finally, OPR has implications surrounding privacy, visibility, and author rights. Not everyone welcomes the idea of engaging in dialogue with potential critics or is comfortable having comments visibly published. Students and authors have a right to participate in ways that allow them to feel safe, and different options should be made available. Novice learners may be comfortable participating in OPR on certain levels, such as open reports or open final commenting during the post-print stage of publication, but they should not be required to jump into the deep end and embrace the more intense characteristics (e.g., open identities). DeRosa and Jhangiani (2017) explain that “open is not the opposite of private…students can (and should) control how public or private they wish to be” (as cited in Shuttleworth et al., 2019, p. 12). On the positive side, the inherently flexible nature of OPR allows for a spectrum of transparency in these models, and thoughtful design and implementation can account for these concerns.

Despite the challenges, the benefits and possibilities inherent within OPR have the capability to improve scholarly communication systems. Peter Suber, a recognized authority within the open access movement, recently agreed that “open peer review is a promising approach” because new journals can demonstrate exactly how they perform peer review and at what level of quality and rigor (in an interview by Hulagabali, 2019, para. 19). Suber’s comments highlight how OPR is a multi-layered approach, not a single method designed to replace the authority and role of traditional peer review. OPR can be understood as a way of aligning the traditional gold standard of determining quality, scope, and relevance with new values of transparency, openness, and collaborative knowledge creation. Fitzpatrick (2010) notes, “we must also find ways to convince ourselves, our colleagues and our institutions of the value that is produced by the use of such systems” (p. 162). Academic librarians are uniquely positioned to provide leadership in this area, with specialized knowledge of and involvement in scholarly communication and information literacy instruction.

How Librarians Can Utilize OPR to Enhance Information Literacy

The ACRL's (2013) *Intersections of Scholarly Communication and Information Literacy* white paper states, "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" (p. 3). Academic librarians should take advantage of the opportunities afforded in OPR models to advance open scholarship objectives while simultaneously enhancing information literacy. Creatively incorporating OPR activities into student learning initiatives leads to a higher-level understanding of peer review as a foundational aspect of scholarly communication and positions students as content creators, not just consumers. Although aspects of all six frames of the ACRL (2016) *Framework* can be implemented through OPR practices, only the "Scholarship as Conversation," "Authority is Created and Contextual," and "Information Creation as Process" frames are explored here, as they provide the clearest opportunities for practical applications of OPR.

Scholarship as Conversation

The "Scholarship as Conversation" frame suggests students increase their understanding by "critically evaluating contributions made by others in participatory information environments" and maintain a disposition whereby they "see themselves as contributors to scholarship rather than only consumers of it" (ACRL, 2016, p. 21). When novice learners have more avenues for conversation, it follows that a wider variety of individuals will have a voice, and scholarly discourse will be more robust. According to Ford's (2018, p. 13) summary of an ACRL conference presentation by Charlotte Roh, Emily Drabinski, and Harrison W. Inefuku, the presenters argued that "scholarly communication can be a mechanism to shrink the equity gap and move toward a more socially just scholarly publishing system." By opening up peer review practices to include student communities, diverse voices are invited to join the conversation, providing new perspectives that would otherwise not be included.

This frame also points to the core concept that "experts are inclined to seek out many perspectives, not merely the ones with which they are familiar" and understand that scholarship is an ongoing conversation (ACRL, 2016, p. 20). OPR models that allow for author-reviewer interaction (open interaction) and those that invite reader commentary (open participation) foster especially inclusive and diverse discussions. As Ford (2018) points out, "the peer review process is an avenue in which many scholarly conversations occur," helping establish the larger context of the research and its impact (p. 7). In addition, Fitzpatrick (2010) suggests that as a community of scholars, we have an "ethical commitment to one another [which] requires an active participation in discussion and debate…working to press both author and reader toward a deeper understanding of the questions involved" (p. 174). OPR models invite wider participation and facilitate rigorous discussion, drawing out both the achievements and shortcomings of scholarly works, effectively implementing "Scholarship as Conversation." As students and novice learners participate openly in discussions, respond to constructive feedback, and learn to create content, their work is strengthened, which in turn benefits the whole community.

Authority is Created and Contextual

The "Authority is Created and Contextual" frame encourages novice learners to "respect the expertise that authority represents while remaining skeptical of the systems that have elevated that authority and the information created by it” (ACRL, 2016, p. 12). OPR models allow students to interact with experts, develop their own voices, and recognize the responsibility of “seeking accuracy, reliability, respecting intellectual property and participating in communities of practice” (ACRL, 2016, p. 12). When expert peer reviewers have their identity known (open identities), novice learners can recognize and evaluate credible sources and different types of authority. OPR models that allow interaction between reviewers and authors (open interaction) enable the development of self-awareness and bring participants face-to-face with diverse worldviews, biases, and ideas. Developing awareness and open-mindedness when encountering conflicting perspectives or responding to critique is a key disposition of this frame, and it can be nurtured through engaging with OPR. Compared to blind peer review, which remains behind closed doors, open participatory models allow participants to recognize and respond to the core idea that “authority is constructed [and] various communities may recognize different types of authority” (ACRL, 2016, p. 12). This leads to a greater awareness of the role of authority in scholarly communities and how to identify authoritative sources in various contexts.

Information Creation as Process

Lastly, the “Information Creation as Process” frame explains how information is produced to convey a message and that the processes involved in creating information are iterative, varied, and result in different products for different needs (ACRL, 2016, p. 14). Peer review, as an accepted indicator of quality within the academy, is a foundational element of the creation of scholarly information, as are the iterative processes of revision and editing. OPR models are designed to improve these elements and counteract deficiencies within closed systems such as unfair bias and wastefulness. For example, open pre-review manuscripts invite interactive community discussion, giving authors an immediate path to revision before formal peer review and publication. Further, open final version commenting reflects an emerging reality that the internet has enabled “ongoing perpetual process peer review in a wider sense,” and “the reputation of a piece of work is continuously evolving as long as it remains a subject of discussion” (Ross-Hellauer, 2017, p. 12). These OPR traits help novice learners recognize the implications of information formats that contain static or dynamic information.

This frame also emphasizes that “the dynamic nature of information creation and dissemination requires ongoing attention to understand evolving creation processes” (ACRL, 2016, p. 14). An innovative OPR method known as “collective conversational peer review” (designed to integrate medical education and practice) exemplifies the use of an evolving creation process as a critical appraisal tool for submitted manuscripts, which simultaneously offers medical students publication credit and interactive training (Podder et al., 2018, p. 112). This type of dynamic peer review is an excellent example of a new information product giving participants a way to “articulate the traditional and emerging processes of information creation and dissemination in a particular discipline” (ACRL, 2016, p. 14). By collaborating with faculty across disciplines, academic librarians can incorporate these innovative approaches to peer review as a creative method to implement the frame “Information Creation as a Process.”

Practical Ideas for Integrating OPR into Information Literacy Efforts

OPR models are diverse, flexible, and adaptable to the varied needs of scholarly communities across disciplines. Academic librarians, with specialized knowledge of the wider scholarly communication landscape and information literacy needs of users, can work collaboratively to incorporate these innovative and emerging models into library services. The following list of suggestions is offered as a starting point for academic librarians, faculty, and students to pursue practical and immediate paths towards implementing OPR traits into information literacy and outreach programs, curricula, journals, assignments, and other scholarly communication contexts:

- Build awareness and understanding of OPR traits and how they can be tailored for different scholarly communities through conference presentations, workshops, tutorials, and discussions. For a useful typology of peer review traits organized by dimension and attribute, refer to “The Changing Forms and Expectations of Peer Review” (Horbach & Halffman, 2018).
- Implement OPR models into existing LIS journals, utilizing best practice guides as tools (e.g., Ross-Hellauer & Gorogh (2019), Directory of Open Access Journals (n.d.), and Fitzpatrick & Santo (2012)). Some LIS journals, such as *The Journal of Radical Librarianship* (https://journal.radicallibrarianship.org/); *The Journal of Creative Library Practice* (https://creativelibrarypractice.org/); *Code4Lib* (http://code4lib.org/); and *In the Library with the Lead Pipe* (http://www.inthelibrarywiththeleadpipe.org/*)*, have already embraced OPR traits in various formats and are actively providing opportunities for authors and readers to gain experience with this model.
- Include open peer review instruction and experiential training as components of MLIS degree courses. For example, Western University’s Scholarly Communication and Open Access Publishing course requires students to

conduct peer review for the student-run journal *Emerging Library & Information Perspectives*, incorporating two OPR characteristics: open interaction (reviewers are known to each other and collaborate on the reports) and open reports (the final peer review reports are made available to the authors) (Seelye et al., 2019, p. 503).

- Collaborate with faculty across disciplines to design and implement course assignments that include opportunities for students to participate in community-based knowledge creation and collective peer review activities. For example, Wikipedia editing activities such as the 1Lib1Ref campaign (1Lib1Ref, n.d.), participating in peer review of Wikipedia articles (Wikipedia: Peer Review, n.d.). and commenting on open manuscript pre-print servers, such as ArXiv (physics, mathematics and computing), PsyRxiv (psychology), and The Winnower (interdisciplinary, includes library sciences).
- Incorporate various OPR traits into student-run journals (e.g., publish transparent peer review policies; include open reports and open interaction, etc.). For a description of OPR traits, see Ross-Hellauer (2017).
- Search for discipline-specific open access journals already practicing OPR (e.g., *BMC*, *Copernicus*, *eLife, F1000Research*, *PeerJ*, etc.) and incorporate these into student assignments. For example, students could be tasked with examining the peer review policies, as well as discovering and reading an original article of interest, in addition to the published peer review reports, followed by analysis and discussion of how peer review impacted the final version of record.

- Facilitate and support ongoing communities of practice for student-run journals. These could facilitate professional development opportunities including OPR instruction and training, in addition to encouraging continuing OPR practice and advocacy.

Conclusion

The era of digital scholarly publishing is transforming how information is created, disseminated, discovered, accessed, and used. Alongside this digital revolution, traditional systems of scholarly communication are being reconsidered and restructured to align with emerging values of openness, including the foundational element of peer review. These emerging and innovative models of OPR are encouraging transparency and accountability, while at the same time providing new pathways for communal knowledge production. This transformation of the scholarly communication landscape has led to exciting and dynamic opportunities for academic librarians to contribute to the development of innovative student learning initiatives. As Fitzpatrick (2010) explained, “in electronic scholarly publishing, the community is necessary not just to the post publication review and filtering process but to the production of content itself” (p. 173). This new idea, that scholarship is a collaborative process, has the potential to empower students to be content creators, not just consumers, and it shifts peer review from a gatekeeping role to a participatory activity with the goal of advancing the community as a whole. By creatively and collaboratively leveraging OPR models to enhance information literacy and the delivery of library services, librarians and faculty will also further the development, awareness, and understanding of the value of OPR in today’s participatory knowledge commons.

References

1Lib1Ref. (n.d.). In *Wikipedia*. https://en.wikipedia.org/wiki/1Lib1Ref

Association of College and Research Libraries. (2013). *Intersections of scholarly communication and information literacy: Creating strategic collaborations for a changing academic environment* [White paper]. Association of College and Research Libraries. http://www.ala.org/acrl/sites/ala.org.acrl/files/content/publications/whitepapers/Intersections.pdf.

Association of College and Research Libraries. (2016*). Framework for information literacy for higher education* [PDF file]. http://www.ala.org/acrl/standards/ilframework

Bali, M. (2015). A new scholar's perspective on open peer review. *Teaching in Higher Education*, *20*(8), 857–863. https://doi.org/10.1080/13562517.2015.1085857

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher, 18*(1), 32–42. https://doi.org/10.3102/0013189X018001032

Crossref. (2018, June 5). *Introducing metadata for peer review.* https://www.crossref.org/news/2018-06-05-introducing-metadata-for-peer-review/

D'Andrea, R., & O'Dwyer, J. P. (2017). Can editors save peer review from peer reviewers? *PLOS ONE, 12*(10), e0186111. https://doi.org/10.1371/journal.pone.0186111

Dawson, D., & Marken, L. (2019). Beyond consumers: The value of engaging undergraduate students in journal management and authorship. In A. S. Jackson,

C. Pierard, & S. M. Schadl (Eds.), *Scholarship in the sandbox: Academic libraries as laboratories, forums, and archives for student work* (pp. 269–290). Association of College and Research Libraries.

Directory of Open Access Journals. (n.d.). *Principles of transparency and best practice in scholarly publishing*. https://doaj.org/bestpractice

Donovan, C., & O'Donnell, S. (2013). The tyranny of tradition: How information paradigms limit librarians' teaching and student scholarship. In S. Higgins & L. Gregory (Eds.), *Information literacy and social justice: Radical professional praxis* (pp. 121–142). Library Juice Press.

Duckett, K., & Warren, S. (2013). Exploring the intersections of information literacy and scholarly communication. In S. Davis-Kahl & M. K. Hensley (Eds.), *Common ground at the nexus of information literacy and scholarly communication* (pp. 25-44). Association of College and Research Libraries.

Fitzpatrick, K. (2010). Peer-to-peer review and the future of scholarly authority. *Social Epistemology*, *24*(3),161–179. https://doi.org/10.1080/02691728.2010.498929

Fitzpatrick, K., & Santo, A. (2012, December). Open review: A study of contexts and practices. *The Andrew W. Mellon Foundation,* https://mellon.org/news-blog/articles/open-review-study-contexts-and-practices/

Ford, E. (2016). Opening review in LIS journals: A status report. *Journal of Librarianship and Scholarly Communication*, *4*, 1–29. https://doi.org/10.7710/2162-3309.2148

Ford, E. (2018, April 4). Scholarship as an open conversation: Utilizing open peer review in information literacy instruction. *In the Library with the Lead Pipe.* http://www.inthelibrarywiththeleadpipe.org/2018/open-conversation/

Garvey Algero, M. (2017). Long live the student-edited law review. *Touro Law Review, 33*(2), 379–386. http://digitalcommons.tourolaw.edu/lawreview/vol33/iss2/3

Godlee, F. (2000). The ethics of peer review. In A. H. Jones & F. McLellan (Eds.), *Ethical issues in biomedical publication* (pp. 59–84). Johns Hopkins University Press.

Haffar, S., Bazerbachi, F., & Murad, M. H. (2019). Peer review bias: A critical review. *Mayo Clinic Proceedings*, *94*(4), 670–676. https://doi.org/10.1016/j.mayocp.2018.09.004

Harvard Library. (n.d.). *Scholarly resources for SLS 19*. https://guides.library.harvard.edu/SLS19/Scholarly

Horbach, S. P. J. M., & Halffman, W. (2018). The changing forms and expectations of peer review. *Research Integrity and Peer Review, 3*(8). https://doi.org/10.1186/s41073-018-0051-5

Hulagabali, S. (2019, June 29*). Peter Suber: The largest obstacles to open access are unfamiliarity and misunderstanding of open access itself.* Open Interview. https://openinterview.org/2019/06/29/peter-suber-the-largest-obstacles-to-open-access-are-unfamiliarity-and-misunderstanding-of-open-access-itself/

Jensen, M. (2007). Authority 3.0: Friend or foe to scholars? *Journal of Scholarly Publishing, 39*(1), 297–307. https://doi.org/10.1353/scp.2007.0027

Lee, C. J., Sugimoto, C. R., Zhang, G., & Cronin, B. (2013). Bias in peer review. *Journal of the American Society for Information Science and Technology*, *64*(1), 2–17. https://doi.org/10.1002/asi.22784

Mount Saint Vincent University Library and Archives. (n.d.). *Scholarly journals and peer review*. https://libguides.msvu.ca/help/scholarlypublishing

Navalta, J., & Lyons, T. (2010). Student peer review decisions on submitted manuscripts are as stringent as faculty peer reviewers. *Advances in Physiology Education, 34*(4), 170–173. https://doi.org/10.1152/advan.00046.2010

Podder, V., Price, A., Sivapuram, M. S., Ronghe, A., Katta, S., Gupta, A. K., & Biswas, R. (2018). Collective conversational peer review of journal submission: A tool to integrate medical education and practice. *Annals of Neurosciences, 25*(2), 112–120. https://doi.org/10.1159/000488135

Ross-Hellauer, T. (2017). What is open peer review? A systematic review. *F1000Research*, *6*, 588. https://doi.org/10.12688/f1000research.11369.2

Ross-Hellauer, T., Deppe, A., & Schmidt, B. (2017). Survey on open peer review: Attitudes and experience amongst editors, authors and reviewers. *PLOS ONE, 12*(12), e0189311. https://doi.org/10.1371/journal.pone.0189311

Ross-Hellauer, T., & Görögh, E. (2019). Guidelines for open peer review implementation. *Research Integrity and Peer Review, 4*(4), 1–12. https://doi.org/10.1186/s41073-019-0063-9

Schmidt, B., Ross-Hellauer, T., Van Edig, X., & Moylan, E. C. (2018). Ten considerations for open peer review. *F1000Research*, *7*, 969. https://doi.org/10.12688/f1000research.15334.1

Seelye, M., Edgar, M., & Harrington, M. (2019). Learning by doing: Highlighting the successful collaboration between an open access peer-reviewed journal, a scholarly communication class, and a supportive library. *College and Research Libraries News, 80*(9), 502–505. https://doi.org/10.5860/crln.80.9.502

Shuttleworth, K., Stranack, K., & Moore, A. (2019). Course journals: Leveraging library publishing to engage students at the intersection of open pedagogy, scholarly communications, and information literacy. *Partnership: The Canadian Journal of Library and Information Practice and Research, 14*(2), 1–20. https://doi.org/10.21083/partnership.v14i2.5339

Smith, R. (1997). Peer review: Reform or revolution? Time to open up the black box of peer review. *British Medical Journal*, *315*(7111), 759–760. www.jstor.org/stable/25175780

Spezi, V., Wakeling, S., Pinfield, S., Fry, J., Creaser, C., & Willett, P. (2018). “Let the community decide”? The vision and reality of soundness-only peer review in open-access mega-journals. *Journal of Documentation, 74*(1), 137–161. https://doi.org/10.1108/JD-06-2017-0092

Stone, W., Navalta, J., Lyons, T., & Schafer, M. (2018). From the Editors: A guide for peer review in the field of exercise science. *International Journal of Exercise Science, 11*(1), 1112–1119.

Tennant, J. P. (2018). The state of the art in peer review*. FEMS Microbiology Letters, 365*(19), 1–10. https://doi.org/10.1093/femsle/fny204

Tennant, J. P., Dugan, J. M., Graziotin, D. et al. (2017). A multi-disciplinary perspective on emergent and future innovations in peer review*. F1000Research*, *6*, 1151 https://doi.org/10.12688/f1000research.12037.3

Uigín, D. N., Higgins, N., & McHale, B. (2015). The benefits of student-led, peer-reviewed journals in enhancing students' engagement with the academy. *Research in Education, 93*(1), 60–65. https://doi.org/10.7227/RIE.0010

University of Toronto – Scarborough. (n.d.). *Understanding peer review.* https://guides.library.utoronto.ca/peer-review

Ware, M. (2011). Peer review: Recent experience and future directions. *New Review of Information Networking, 16*(1), 23–53. https://doi.org/10.1080/13614576.2011.566812

Wikipedia: Peer review. (n.d.) In *Wikipedia*. https://en.wikipedia.org/wiki/Wikipedia:Peer_review

Xenidis, R., Deutscher, E., & Böök, B. (2017). Managing a student-run peer-reviewed legal journal: Ten years of bridging research and experience. *European Journal of Legal Studies, 10*(1), 1–15.