

Title: The Power of Peers: Approaches from Writing and Libraries

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Abstract: *Article Classification - Case Study*

Purpose - This case study discusses different strategies for implementing peer teaching as well as different roles for peer teachers in both academic libraries and writing-intensive courses. It explores connections to critical pedagogy, sociocultural theory, open educational practices (OEP), and high-impact practices (HIPs).

Design/methodology/approach - The methodologies for implementing the three scenarios discussed in the paper differ widely. All approaches include some form of student feedback through focus groups, exit surveys, or end-of-class assessments.

Findings - In both library and writing program settings, students have experience with and a favorable opinion of peer-assisted learning strategies.

Practical implications - These case studies provide concrete examples of how to develop different types of peer teaching interventions. The cases also detail benefits as well as challenges to implementation.

Social implications - Providing opportunities for peers to lead through teaching others has the potential to boost an individual's sense of confidence, leadership, and improve their own learning, as well as giving students experiences to build upon and apply to their everyday lives and future careers.

Originality/value - While peer teaching is widely implemented in many disciplines, such as STEM, its adoption in academic libraries has sometimes been viewed as controversial. This case study adds to the body of literature demonstrating that peer teaching is possible and

desirable.

Keywords: peer teaching, information literacy, writing programs

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Introduction

The information landscape continues to grow and change (Domo, 2017). Information challenges are exacerbated by the ever-increasing amount of available information, and traditional models for controlling published information no longer apply (Piwowar *et al.*, 2018). With the migration of scholarly publishing to a digital environment, the models of delivery have become more diverse and complex (Ellis, 2019). There has also been a shift in expectations of availability and quality among consumers of this information, particularly among students (Heick, 2018; Horrigan and Rainie, 2002). Students have difficulty evaluating which information sources are credible (Breakstone *et al.*, 2018; McGrew *et al.*, 2018; Wineburg *et al.*, 2016). When confronted by information challenges, students often turn to friends for assistance before turning to their professor, librarian, or other formal source of support (Beisler and Medaille, 2016). In order to support students as they navigate a world in which peer-reviewed articles show up alongside user-generated content in search results (Seale, 2010) where information can be confusing, anxiety-inducing and sometimes disempowering (Mellon, 1986; Brook *et al.*, 2015), the authors set out to find new approaches. The authors desired these approaches be student-centered, effective, efficient, empowering, and, because the authors are also interested in critical pedagogy, possibly even liberatory. Peer teaching can address these criteria by empowering students to teach and learn from one another and their environment. Peer teaching harnesses the social credibility of a relatable guide as an approach to teaching information literacy (IL) practices and can transform learning for both the teacher and the learner.

The authors are interested in preparing upper-level or more experienced undergraduate students to serve as peer teachers to lower-level or novice students to help them navigate the complex information landscape and adopt lifelong IL practices. At the University of Colorado Colorado Springs (UCCS), the Writing Across the Curriculum (WAC) program Director (co-author Neely) implements peer strategies through the Writing Fellows program, which has the

ability to extend teaching beyond the classroom or faculty office hours and meet students at the point of need. At IUPUI, a group of librarians (co-authors Maxson, Stone, Lowe, Macy, and Miller) began exploring the possibility of training peer teachers as the lead teacher in Information Literacy (IL) sessions in a classroom to help share the burden of countless one-shot sessions and to give students experience they could translate into job market skills and build practices to empower lifelong learning. In addition to semester-length training and a writing fellows program, this paper also explores how to scale peer-assisted learning (PAL) techniques to a one-shot or similar teaching context (co-author Roberts, from the University of Colorado Boulder). This paper provides background on PAL, the benefits for peer teachers and learners, and the theoretical foundations that make it effective. It will then examine the three mentioned cases in detail and discuss the considerations for implementing PAL at various scales.

Origins of Peer-Assisted Learning and Theoretical Foundations

Simply defined, peer teaching occurs when students teach other students. Topping and Ehly define PAL as “a group of strategies that involve the active and interactive mediation of learning through other learners who are not professional teachers” (2001, p. 113). Since PAL involves a group of strategies, there are many terms that fall under that umbrella term. Peer teaching, reciprocal peer teaching, peer-to-peer learning, and peer tutoring are all found in the literature. Boud distinguishes peer learning and peer teaching, suggesting that peer teaching involves a more specific and formalized role, such as a paid tutor (2001). Boud further highlights the similarities of peer learning with concepts like collaborative or cooperative learning (2001). According to Topping and Ehly (2001), PAL has some hallmark characteristics including: benefits to both peer teacher and learner, structure that allows all participants to improve in one or more areas, can be supplemental to and facilitated by professional teachers, and is available to all (as cited in Rinto *et al.*, 2017). In earlier work, Topping developed a typology of ten

dimensions of peer tutoring, including 'role continuity', whether the relationship is reciprocal or one-way (1996).

The value of peer teaching in higher education gained attention in the 1960s through works such as Sanford (1962) and Newcomb and Wilson (1966). Bruffee (1984) explains that the roots of peer teaching in writing programs dates back about that far as a type of collaborative learning with peer tutoring for writing as an alternative to the traditional classroom. Deese-Roberts and Keating note that peer-assisted learning took on the forms of peer tutoring and peer counseling in the 1970s and, as part of the discussion on retention and diversity in the 1980s, peer tutoring was implemented in programs and learning centers around the United States (2000). Librarians began exploring PAL strategies in the late 1990s in roles like mentors, research assistants, and teaching assistants (Deese-Roberts and Keating, 2000). PAL benefits the library through improving student learning outcomes and, by requesting and listening to student perspectives, it can improve services and resources (Rinto *et al.*, 2017). Once established, a PAL program can extend the services of the library through student work and allows the library to allocate the time of professionals in other areas. PAL may also have the potential to reach beyond the involved students as they pass on what they have learned to other students outside the peer programs (Aguilar and Keating, 2009). In this way, PAL extends the work of writing programs and libraries to other student populations and, potentially, to the larger community.

Within the library context, many texts on effective teaching of IL focus on the teacher-student relationship (Booth, 2011; Klipfel and Cook, 2017) but the library literature on student-led peer learning is fairly new (Bodemer, 2014; Rinto *et al.*, 2017; Fargo, 2018). The benefits of peer teaching for libraries are many; not only can peer teaching extend the capacity of libraries to integrate IL into more courses but peer teachers can serve as library ambassadors, sharing awareness of resources and services to a wider audience (Aguilar and Keating, 2009; Faix *et*

al., 2010). The proximity of students to their peers makes them an accessible resource for classmates who are intimidated or confused about library research or meeting with a librarian or their professor (Mellon, 1986). Because students seek out their peers for assistance (Head and Eisenberg, 2010), libraries should embrace and cultivate the conditions that make peer learning fruitful. Fargo explains, "By supporting and growing peer-to-peer services, we give our patrons another option for research support — a student employee who might have taken the class the student is seeking help in, a student employee who better understands the experience of being a student at the institution, or a student employee that can vouch for and recommend library services and support, like subject librarians" (2018, n.p.). Watkins and Morrison (2015) also found evidence of students becoming more likely to seek out subject librarians after interaction with peer tutors. These realities also resonate in the field of writing, where collaborative learning is encouraged as a means of engaging students with course material, potential audiences, and one another (Bruffee, 1984).

PAL offers many benefits. Drawing on Piaget's developmental psychology (1970) and Vygotsky's sociocultural learning theories (1978), peer teaching has been shown to be successful not only for the peer teacher, but for the peer student as well. For the peer student, PAL contributes to an individual learner's development in positive ways in cognitive, affective, and social domains (Rinto *et al.*, 2017). Students have someone teaching them closer to their cognitive level who can describe things in a vocabulary and manner that is more accessible (Cornwall, 1980). The peer teacher benefits in these domains as well as strengthening their own learning and leadership (Rinto *et al.*, 2017). Peer teaching is effective because, in teaching someone else, peer teachers are forced to look at the deeper structure of a subject and better internalize the material rather than simple memorization or problem solving (Hattie, 2009; Mazur, 2014).

PAL makes learning more effective by leveraging social connections. Peers and the social connections they afford play an important role in learning if we consider the sociocultural perspective (see Gee, 2008; Lim and Renshaw, 2001; Wenger, 1998; and Vygotsky, 1976). Gee explains there is not one accepted sociocultural theory but rather a variety of perspectives and disciplinary lenses (2008), and he defines it as looking “at knowledge and learning in terms of a *relationship* between an individual with both a mind and a body and an environment in which the individual thinks, feels, acts, and interacts.” (2008, p. 81). Gee explains how peers fit into the learner’s environment: “Of course, other people (experts and peers) are one special category of ‘objects’ in learners’ environments. Different people with different sorts of knowledge and skills afford different learners quite distinctive possibilities of action through talk and shared practices...” (2008, p. 82). In other words, learning is a social activity that takes place in an environmental context and in collaboration with others. Using these ideas, we can see PAL as a sociocultural practice, and we can expect that peer learning happens when meaning is constructed by the group.

When IL is deployed through a PAL model, IL practices become meaningful through collaborative and participatory activities with peers. In the context of libraries and IL, Lupton and Bruce argue, “in this [situated/sociocultural] perspective, literacy is contextual, authentic, collaborative and participatory. Literacy involves individuals and groups making decisions, making meaning and solving personal, work, family and community problems.” (2010, p. 5). PAL reduces the social barriers and power dynamics of a traditional teacher-student interaction, and this can empower students to more effectively tackle real-world problems. Hicks adds, “the adoption of a sociocultural perspective on IL establishes and facilitates a more inclusive and holistic approach for exploring the connections between people and information” (2018, p. 70). Hicks argues IL theory and practice emerge from everyday settings. PAL creates the opportunities for sharing real-world experiences, allowing peers to bring in how they think, feel,

act and interact in relationship to their environment. In other words, IL can be more authentic. Bringing in everyday contexts requires an openness to the diversity of students' experiences and backgrounds. Brook, Ellenwood, and Lazzaro argue, "libraries in the twenty-first century should and must represent the vibrant, messy, beautiful, complicated, and diverse communities they serve. It is the responsibility of this profession to support marginalized voices and perspectives within its institutions, to be challenged by those voices, and to be changed by them" (2015, p. 268). In an educational context, the sociocultural perspective facilitates a more exploratory, responsive, and inclusive approach to learning, and can create opportunities to learn in order to ensure all students have the chance to succeed (Gee, 2008; Lim and Renshaw, 2001). Therefore, peer learning is not only effective, but also has the potential to create a more inclusive learning environment for students (Gillies *et al.*, 2007).

The shared practices that Gee mentions, if carried out collaboratively or related to a common endeavor, can also be considered activities of a "community of practice" (Gee, 2008; Wang, 2007). PAL does not have to be used in a community of practice, but that model can be a useful way to carry out IL practices especially in the context of the 2016 *ACRL Framework for Information Literacy for Higher Education*, or the "*Framework*." The social and collaborative aspects of IL and the underlying theories of PAL are reflected in the *Framework*: from authority as influence exerted in a community, to ethical use of information following community norms, to inquiry that investigates societal questions, and encourages learners to recognize and participate in scholarly conversations and communities. Wang suggests collaboration makes learning more effective: "Collaborative learning, based on sociocultural learning theories, provides learners with more effective learning opportunities. Students learn in a community-of-learners environment, where they act as community members" (2007, p. 150). The introduction to the *Framework* envisions IL as "an overarching set of abilities in which students are consumers and creators of information who can participate successfully in collaborative spaces"

(ACRL, 2016). In the *Framework*, IL involves “participating ethically in communities of learning” (ACRL, 2016). Hicks explains, “the prominence of disciplinary context within the introductory preamble to the Framework as well as the addition of ‘communities of learning’ to the 2016 definition of information literacy..., which is a clear reference to Wenger’s socioculturally situated work on Communities of Practice, could be seen as providing further evidence that the Framework embraces a sociocultural philosophy” (2018, p. 72). If both the Framework and PAL are aligned with sociocultural theory, we can embrace PAL as a vehicle for putting the *Framework* into practice and facilitating learning, possibly through fostering a community of practice approach. Academic libraries can foster communal learning through PAL strategies and by creating an environment and providing the spaces in which students can learn from one another (see Gee, 2008).

Notably, peer teaching shares foundational ideas with critical pedagogy, which is grounded in the work of Paulo Freire and has been translated into library instruction as critical information literacy (see Freire, 2000; Downey, 2016). Critical IL, is defined by Accardi, Drabinski, and Kumbier in their book *Critical Library Instruction: Theories and Methods* as: “a library instruction praxis that promotes critical engagement with information sources, considers students collaborators in knowledge production practices (and creators in their own right), recognizes the affective dimensions of research, and (in some cases) has liberatory aims.” (2010, pp. xi-xii). Critical pedagogy and critical IL recognize the knowledge and agency of students and seeks to empower them to contribute to the conversations through dialogue. In *We Make The Road by Walking*, Horton and Freire discuss the philosophies behind their approaches to education: Horton says about his formative years, “we all agreed we had to start learning from the people we were working with, and that we had to learn from each other”, and at an early point in his career, Freire decided to call teachers a “‘coordinator of discussion, of debate, dialogue.’ And the students I called ‘participants of discussion’” (Horton and Freire, 1990, p. 84). PAL strategies

center the student in the pedagogy and provide agency and empowerment through valuing students' experiences and positioning them as knowledge creators and co-creators. Seen through the lens of critical pedagogy, PAL has liberatory aims in that it frees both the teacher and student from the traditional classroom "sage on the stage" power dynamics and honors students' identities and agency.

PAL also intersects with the concept of open educational practice (OEP) when students are involved in co-creating and deploying the curriculum. Paskevicius defines OEP as, "teaching and learning practices where openness is enacted within all aspects of instructional practice; including the design of learning outcomes, the selection of teaching resources, and the planning of activities and assessment. OEP engage both faculty and students with the use and creation of OER...and support participatory student-directed projects" (2017, p. 127). According to Ehlers (2013), OEP involves pedagogical practices that "rely on social interaction, knowledge creation, peer learning and shared learning practices" (as cited in Paskevicius, 2017, p. 127). Although this intersection with OEP warrants further explanation, this paper's scope does not allow for it.

Case Studies: Employing the power of peers in different contexts

This paper addresses three case studies for implementing PAL at various scales: through a Writing Fellows program; as teachers in IL instruction; and in one-shot instruction sessions. Each are discussed in detail below.

Writing Fellows Embedded in Courses Throughout the Curriculum

The Writing Fellows Program (WFP) at UCCS embeds students in writing intensive courses to support other students with their writing. It began in 2015 as an outgrowth of a general education initiative to support the requirements of new Writing Intensive (WI) courses, which have been identified as a high-impact practice (HIP) (Kuh, 2008). Writing Fellows were

envisioned to support the feedback process of WI courses, as WI courses are required to provide feedback to students about their writing and require students to revise their writing based on received feedback. During the time that WI courses were implemented, the UCCS campus had been growing, with the work of expansion often falling to non-tenured instructors. To keep up with the growth, the WAC and General Education Program conceived the WFP as a way to support undergraduate writing and the faculty who were teaching designated WI courses. As an added incentive, faculty could pick their writing fellow (WF), often a student who had previously taken their course. The WFP also provides hands-on experience to student fellows. The fellows not only fill a labor gap but create a mutually beneficial interaction with the faculty (Zawacki, 2008); positive features that have been noted across WF programs since their implementation across colleges and universities in the 1980s (Hall and Hughes, 2011).

UCCS had considered creating a course for the fellows, but instead of students self-selecting through enrollment, the WAC Director determined it would create buy-in with faculty if they could choose their student fellow. Once a fellow is identified, the WAC Director reviews and approves the student for the paid position. Initially, the WAC Director meets with the fellow and faculty to compose the job description and to provide initial readings; then, throughout the semester of their employment, the fellow meets with the WAC Director for consultation. The WFP differs from the student tutors in the writing center in that the fellow is associated directly with an individual course and works with the course faculty member to provide feedback on drafts of student writing for that course.

The WFP provides many benefits to the fellows, the students they work with, and the faculty member. The fellows act as liaisons between the faculty and the students taking the course and have relationships with each. Since they have cognitive and social proximity to the enrolled students, fellows can enhance conversations going both directions. Fellows provide people

power for revision process work. They may promote positive shifts in beliefs about learning for students and their faculty (Zawacki, 2008) and for writing fellows themselves (Mullin *et al.*, 2008). In turn, the cooperating faculty receive support and feedback from the fellows to ensure that instruction is reaching as many students as possible. Fellows can also help faculty achieve course goals and support students to submit higher quality work, as they provide feedback on students' drafts and writing process. Further, faculty interaction with the fellows may help them see new perspectives on assignments and feedback, leading to small shifts in faculty attitudes about teaching writing (Neely, 2017). Each fellow also gets valuable work experience and a peek "behind the curtain" into the professional lives of faculty, which may help reduce anxiety or perceived barriers around going into a teaching role.

Student comments in exit surveys provided insight into their experiences with the fellows. Students consider the writing fellows as a link to privileged information, a credible perspective, and as providing access to resources. Because the fellows often have previously taken the course, enrolled students see them as insiders: "[The fellow] had gone through the class and done this exact project before, so she helped me avoid several pitfalls that students often make." Another student's reflection showed the value of the fellow's disciplinary knowledge, "He told me several general things that I think improved my paper a huge amount. He was also very class specific, meaning, he knew prob and stats." A key to a fellow's insider status is their cognitive and social proximity to the students taking the course: "He is still a student and fresh out of school so he was still super insightful and helpful."

Fellows have credibility in the eyes of the students: "[The fellow] had knowledge of writing technical reports beyond that of the Engineering department. The[y] gave better feedback than any of the teacher's assistants, graders, or instructor. The writing fellow was also far timelier and more respectful than any of the teacher's assistants, graders, or instructor. The writing fellow

was the best part of the entire class.” Other students’ comments reflect the esteem they have for the fellows: “[h]aving a different perspective on my works [was helpful]. I can tell she is very good at writing and I respect her opinion,” and “I thought she was exceeding detailed, thorough, and really helpful.”

The fellows are seen as both a resource and providing access to resources. One student reflected, “I really need some practice working on grammar and figuring out how to plan my thoughts. Having the writing fellow helped me organize my thinking and pointed out areas I needed to work on.” Fellows connect students to existing resources at the university: “She did let me know that I was doing my citations wrong and where I could find a resource to fix them because I had no idea I was doing them wrong,” and “I was handed a grading rubric [by the fellow] which helped me restructure my paper.” Fellows are especially seen as helpful in disciplinary contexts, “Get the writing fellows more involved in all of the reports instead of just one. Engineer's [sic] could really benefit with time spent with people who know how to write.”

As with any large-scale program, there are some challenges. There is not enough funding to scale the program up to meet the demand for fellows. Nevertheless, as the WFP grows, the WAC Director needs to ensure a “proper use” of fellows by faculty; they are not teaching assistants or graders. Further, the WAC Director currently has no way of ensuring consistent quality of interactions across all courses beyond exit surveys from course students, faculty, and fellows. Training the fellows also presents challenges. The WAC Director seeks to provide training that is not a barrier to their participation and that provides useful support, customized to each fellow’s unique class context. The fellows are students from all different majors without extra money or time to take a preparatory course.

Looking ahead, the Writing across the Curriculum program plans to engage in a comprehensive evaluation of the writing fellows program and to grow it in order to support more courses in more ways. For instance, there may be opportunities to leverage fellows to support IL through formal partnership with the library.

Developing a Near-Peer Teaching program at IUPUI

In spring 2017, a group of instruction librarians at IUPUI were awarded a curriculum enhancement grant from the IUPUI Center for Teaching and Learning (CTL) to develop the curriculum for a class that teaches IL practices to prepare students to be near-peer teachers. These near-peer teachers would be trained with strong IL skills and pedagogy so they could assist in teaching first-year research sessions and act as advocates for library services. The curriculum was designed originally to support a credit-bearing course (1 credit hour).

As part of the work for this grant, a feasibility study of offering a credit-bearing course was conducted. This analysis involved interviewing key stakeholders in library and school administration to understand how this course could be developed and supported. The library is treated as a school within the university at IUPUI for purposes of faculty governance; yet, it cannot offer credit-bearing courses. In order to create a credit-bearing course, the librarians would need to collaborate with another academic unit. In addition, student focus groups revealed that, in an already full undergraduate curriculum, students preferred the option of an internship-type position. Every student who participated within the focus groups indicated that they have had experience with peer teachers and/or mentors. Students see peer teachers as a valuable resource and as being more available and connected to students when compared to faculty who can be viewed as intimidating or disconnected. Fortunately, the curriculum developed for the class could be translated to an internship-type program for student workers.

The curriculum begins with a two-week boot camp, which is intended as a quick, compact exposure to first-year IL instruction (e.g., one-shot instruction) and basic pedagogical concepts (e.g., formative assessment, lesson plans, learning outcomes). It rapidly introduces students to something they likely experienced for the first time as a learner during their first-year. Following the boot camp, near-peer teachers dive deeper into different IL concepts each week. Librarians designed assignments and identified readings to help the near-peer teacher develop knowledge dispositions as outlined in the *Framework for Information Literacy in Higher Education* (ACRL, 2016). The curriculum, available through IUPUI's scholarly repository (Lowe *et al.*, 2018), also focuses on best practices in pedagogy including lesson planning (Oakleaf *et al.*, 2012), using formative assessment (Oakleaf *et al.*, 2012), and encouraging self-reflection (Badia, 2017; Booth, 2011; Reale, 2017).

When developing the curriculum, it was important to keep the peer teacher in mind. They would likely be sophomore or junior-level students with limited information training. The peer teachers would come from many different disciplines. In fact, the librarians preferred to get students from across the university to maximize reach. This program focus was not to develop future librarians, though that could be a happy bonus. Instead, the program seeks to maximize the positive effects of peer teaching (Baugess *et al.*, 2017; Bodemer, 2014; Salomon *et al.*, 2017) across the undergraduate curriculum.

For the pilot program, librarians were able to collaborate with access services staff to coordinate bundling the peer teacher position with a paid student position at the circulation desk. In this way, the peer teacher would have guaranteed work hours each week regardless of curriculum and teaching load. Additionally, librarians took advantage of the established hiring systems and processes of a library unit that regularly hires and trains students at multiple points during the academic year. Finally, as the peer teaching position is split with access services (circulation), it

was logical and smoother to have the access services manager serve as the official supervisor for the position.

As might be expected, implementation of a brand-new program did not proceed as planned. Concerns of having two separate positions, “Student Information Assistant” and “Student Information Assistant – Peer Teacher” with similar names, meant the peer teaching position was posted later. Consequently, training was delayed by almost two months putting the peer teacher behind other student assistants.

As the curriculum was developed by several librarians, it is also taught by the lead librarian in charge of that portion of the curriculum. This means the peer student has one supervisor who manages day-to-day concerns, but the student worker also reports indirectly to four instruction librarians as they deliver the curriculum. To date, the student peer teacher has not expressed any difficulties with this arrangement. Instead, an issue manifested itself with the official access services supervisor, who initially did not feel empowered to manage the student. Ongoing discussions between access services and the librarians delivering the curriculum keep lines of communication open and will, hopefully, prevent further breakdowns. Finally, the librarians who are participating in the peer teaching program, are also teaching librarians. Finding time to fit in managing and mentoring a student through the curriculum has been challenging.

IUPUI is in the implementation phase of an addition to the student transcript, a separate document called the “Experiential and Applied Learning Record,” which seeks to quantify and record student experiences outside of the classroom, such as service learning, research, and internships (IUPUI Office of Academic Affairs). As the peer-teaching curriculum is a type of internship, the library applied to have this experience added to the “record” and was accepted.

This connection to student learning benefits the library in wider campus discussions of its impact on student learning and success.

Peer Learning in a One-Shot

Librarians have been using teaching strategies in one-shots through activities such as think-pair-share and other various group exercises for many years but may not have thought about them in the context of peer-assisted learning (PAL). Because PAL is so powerful, librarians can use it at a smaller scale such as one-shot information literacy instruction sessions.

Experimenting with PAL in a one-shot environment is also an accessible way to implement these techniques, perhaps before engaging in larger-scale programs such as those in the prior two case studies.

One example comes from the University of Colorado Boulder (CU), a strategy used with the Leadership 4000 capstone course. In this course, students are asked to work with a local community organization to produce a partner profile and a visionary plan of action that is intended to address a leadership obstacle the organization is experiencing. The students use library databases as well as advanced search strategies to gather context on their partner organizations and understand how leadership literature relates to the real-world partner organizations. During the IL sessions, students ask questions to fill in knowledge gaps related to their organization and its unique challenges, then they brainstorm keywords and come up with search statements. This work is recorded in a Google Sheet that is linked in a LibGuide. After student groups complete a round of brainstorming search strategies for their topics, the librarian asks groups to suggest improvements to another group's search statements and shows students the spreadsheets generated from prior semester students who have tackled similar issues.

This approach activates students' prior knowledge and experiences and allows those with previous library research experience to act as peer leaders during group work. This approach also allows PAL to extend beyond one classroom session through the use of asynchronous and social tools like Google Docs and Sheets or Padlet. Adapting PAL in class activities has meant giving less praise and direct feedback and instead involves listening to groups' ideas and asking constructive questions as the librarian rotates and visit groups. The focus shifts from students looking to validate their thinking with the instructor, and instead puts emphasis on students creatively brainstorming and revising their ideas within the group.

Students provide feedback for the library session in an end-of-class assessment through a Google Form. One student reflected the session helped the group to "open up to an outside perspective for missing keywords in our searching efforts such as other classmates less intimate with our community partner." Another student said, "This seminar helped my group and I to understand which databases are the most efficient in regards to our topic. It also helped us see what keywords are most relevant to our partner." Sometimes groups have trouble identifying questions or keywords because they are too "close" to their own topic, but using crowdsourcing and PAL as strategies helps students feel ownership and engagement in the process, while getting insights from classmates.

Discussion

These three case studies differed on several of the typology dimensions outlined by Topping (1996) including curriculum content, contact constellation, and year of study; however, they all shared the common objective of tapping into the potential that PAL can bring to IL and writing instruction to improve student learning outcomes. All seek to increase inclusivity and make the most of inherent social connections between peers or near peers that are unavailable between faculty/instructors and students. One of the goals of PAL is to remove barriers that exist

between faculty/instructors and students due to the fear of self-disclosing a lack of understanding or knowledge (Topping and Ehly, 2001).

Each case exists in a different place on a continuum of community embeddedness and for providing opportunities for group constructed meaning. Topping and Ehly (2001) model the processes that increase the effectiveness of learning through PAL in regards to group constructed meaning. PAL does this for individuals participating in a group “by adding to and extending current capabilities (accretion), modifying current capabilities (retuning), and (in areas of completely new learning or cases of gross misconception or error) rebuilding new understanding (restructuring)” (Topping and Ehly, 2001, p.126). Beginning with the least-embedded option, the one-shot sessions at CU are wholly contained within the framework of a particular class and have the potential for multiple, simultaneous peer interactions based on student experience. The potential for group-constructed meaning, at least within the confines of this particular course, is high, particularly because it provides learners the opportunity for what Topping (1996) refers to as role continuity, which occurs when students shift fluidly from being mentor to mentee from one interaction to the next depending on the class conversation or activity. However, this exercise and these peer relationships do not necessarily extend beyond this single class period. In contrast, the Writing Fellows Program (WFP) at UCCS does not provide fluidity of peer teaching identity of the one-shot sessions so opportunities for group constructed meaning may be reduced; however, Writing Fellows are assigned to a specific course and have the time to develop richer peer relationships both in and out of class reducing potential barriers for students to ask for help and support. The IUPUI peer teacher training model has the most potential variety for peer interactions. Peer teachers could be part of one-shots or recurring classes, but these interactions are spread widely across a number of courses, disciplines, and students. With guidance, peer teachers within this program could plan and execute learning activities that are similar to the one-shot sessions at CU, which could maximize

the relationship ideal of the WFP as well as provide opportunities for group constructed meaning that we see in the one-shots.

The case studies solicited student feedback on the effectiveness of peer teaching and peer mentors at different points during the process. Feedback from the one-shot session conducted at CU indicated that interaction with peers created the opportunity for new perspectives to be introduced and new knowledge to be created, while empowering students in that knowledge creation, all goals of critical information literacy. The WFP program at UCCS gathered qualitative feedback from students in Writing Fellows supported courses. The feedback from students indicated that fellows had a common connection and understanding with the challenges that students face in the class and therefore could provide resources that could assist them in learning. The UCCS WFP program and CU One-Shot session created opportunities for engagement with class material for students that went beyond focusing on the mind (cognitive), and into social interaction and shared construction of meaning. For the near-peer program at IUPUI, student feedback on peer teachers and peer mentors was solicited during the initial program planning process through focus groups, where students indicated past positive experiences and in a mid-term reflection by the peer teacher in the pilot project, which also indicated a positive experience as well as growth in interacting with peers. A next step of the pilot program is to gather assessment feedback in Fall 2019 for near-peer led teaching sessions. Feedback from these case studies indicate considering the learning environment (people, materials, support), and the body (the activity) enable faculty to create a positive learning experience that is rooted in sociocultural theory (see Gee 2008).

The cases are also different in their level of disciplinarity. The one-shot case has built-in disciplinarity as it is tied to a single capstone course. The WFP also has a strong disciplinary focus as fellows are recruited and assigned directly to specific classes. The IUPUI peer training

program has taken a non-discipline-focused approach, at least in its pilot stage. There could be a time when a student would be hired as a STEM or other branded peer teacher. In fact, student input mentioned a desire to have this, based on a participant's major. However, the utility of such a peer teacher in the diverse and unpredictable landscape of IL instruction could be limited. As the program grows, there will be potential for discipline specialization.

A critical step for creating these programs was to understand the hurdles and challenges faced by other institutions who have implemented similar PAL programs. Some are as predictable as they are difficult to solve. Securing initial funding for paid student PAL programs may be difficult. Often programs start as a pilot PAL programs that are funded via grants and other specialized funding (Baugess *et al.*, 2017; Holliday and Nordgren, 2005; Peter, 2013; Reiners, *et al.* 2009). Some secure funding from resources or departments outside the library (Salomon *et al.*, 2017). However, as difficult as securing initial funding can be, the larger challenge comes with determining how to locate sustainable funding as programs grow, an issue both UCCS and IUPUI are currently working to tackle. Another challenge that faces these two PAL programs, which act as internship type experiences, is student recruitment and hiring. Peter (2013) suggests that defining the mission of a program is invaluable as program planning, building institutional support, and implementation occurs. The authors concur with this assessment that defining the purpose and scope of each program has been vital to success. The UCCS WFP creates a job description for each fellow while the IUPUI near-peer teacher program relies on a standard job description. Both programs desire for their fellows or teachers to form their own cohort and support each other, possibly enacting a community of practice. However, the literature indicates that this group cohesion and support may be difficult to achieve unless carefully planned, largely due to student's varying work schedules (Baugess *et al.*, 2017; Murphy, 2016), so this is a work in progress.

Although it may be tempting to think of peer teachers as providing a solution to a heavy workload, the time and engagement to train and supervise students was substantial across both the Writing Fellows and near-peer teacher programs, confirming the experience of other PAL programs that time commitment tends to be underestimated (Holliday and Nordgren, 2005; Peter, 2013). In the case of UCCS, Writing Fellows receive the bulk of their training as they are working with their individual faculty member to support the course-of-focus. Thus, the need for course-level customization makes it difficult to provide general writing fellow training. The IUPUI case has developed formal training for peer teachers. However, executing the curriculum has been one of the most difficult aspects of this process, due to scheduling issues, which often plague peer reference and peer instruction programs during pilots (Baugess *et al.*, 2017; Bodemer, 2014; Curtis, 2016; Holliday and Norgren, 2005). The near-peer teacher is having to complete the formal curriculum and observe/participate in classroom teaching while also performing duties as required for their access services position on the circulation desk. Despite being aware that this is often an issue commented upon in the literature, this has presented difficulties with scheduling and logistics both for a student with a full schedule and multiple teaching librarians. Like Curtis (2016) the length of time to teach the curriculum was extended to manage conflicting schedules.

Alternatively, in the one-shot application of PAL, students are not formally trained but instead invited to share their experiences in ways that are relevant to the task at hand. Librarians and educators using PAL on a smaller scale should choose strategies that fit the desired outcomes and seek to empower students with tasks they can manage. Using PAL in introductory level courses may look different than in Capstone courses such as the case study. Nevertheless, PAL should be supplemental to and facilitated by teachers, not used as a “get out of teaching free” card. Other ideas for smaller scale PAL include: editing and critiquing Wikipedia (see Jacobs, 2010), peer editing of writing products (a technique often employed in writing courses),

interviewing each other, jigsaws, and collaborative mind maps (see Angelo and Cross, 1993, for additional assessment techniques). Librarians and professors can encourage peer learning through extra-curricular activities as well. Laurie Bridges' blog about Speed Friending is just one example of bringing diverse students together for cultural exchange (2014). The literature is full of collaborative active learning activities. Seeking out and employing those with the addition of PAL can further boost students' engagement and adoption of skills and practices, even on a smaller scale.

Conclusion

The tremendous benefits to these PAL programs, outweigh the challenges faced. For students, peer teachers are approachable and accessible. Students have access to fresh insights into problems from peers who have gone through the same or similar issues. Peer teachers can connect students with library and university resources they might not have been aware of as well as improve communication between students and faculty leading to improved performance in course learning outcomes. Peer teachers gain experience directly applicable to careers and/or graduate school that includes improved leadership, communication, and teamwork skills. Rinto, Watts, and Mitola (2017) argue that peer learning shares many characteristics with high-impact practices (HIPs) identified by Kuh (2008) which have been shown to support student learning and persistence. "The librarians who guide these programs are able to directly impact the educational experiences of the peer leaders by creating time-intensive meaningful work opportunities, by allowing peer leaders to engage in substantive mentoring and group learning, by increasing peer leaders' exposure to diversity, by providing peer leaders with timely formative feedback, and by helping peer leaders to apply what they have learned in new contexts. Taken together, these programs can increase peer leaders' understanding of themselves and their place in the greater community" (Rinto *et al.*, 2017, p. 14). These approaches are student-centered, effective, efficient, and empowering.

Peer-assisted learning may seem difficult to implement on any scale, but many colleges and universities are staffing library reference desks with student workers, learning centers with peer tutors, and courses with peer support like writing fellows. The one-shot case study offers smaller scale ideas for exploring PAL. To employ PAL strategies in other areas, librarians and faculty might need to make a case to administration. Because student employment (such as reference assistants) share many characteristics with HIPs (Kuh, 2008), this can help librarians engage with strategic conversations about the library's role on campus. Fargo (2018) argues the hesitancy of libraries and librarians to adopt peer-to-peer services is rooted in fear or anxiety. She seeks to deconstruct the "*either or*" mentality and encourages librarians to embrace a "*both and*" openness to the practice (2018, n.p.). "Some of the most powerful and meaningful justification for these programs can come from the students themselves (Fargo *et al.*, 2018, n.p.)." If we treat our students as co-creators of knowledge, we respect their agency, we empower them, then we can move learning in a more critical and liberatory direction.

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