Open Pedagogy as an Approach to Introducing Doctoral Students to Open Educational Resources and Information Literacy Concepts

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Abstract

In this article, we argue that mutual adaptation can also be applied to understand graduate student implementation of curriculum. We position McLaughlin's framework as an important tool for understanding students' responses to the written and taught curriculum. Open pedagogy experiments can strategically introduce doctoral students to open practices, shaping their adoption of open educational resources (OER) and open pedagogy in their future teaching endeavors. This article describes the cocreation of a doctoral-level course assignment for a midwestern university's School of Education. Utilizing the Association of College and Research Libraries' Framework for Information Literacy, the course prepared doctoral students to curate resources for an OER research guide about commonly used research methodologies. Two librarians and one professor provided active mentoring on OER and infused information literacy concepts in the doctoral course through active learning tools, including video chalk talks, research consultations, and a card sort activity. Using McLaughlin's theory of mutual adaptation, we analyzed student online discussions and course evaluations for evidence of mutual adaptation, resistance, and cooptation. While students generally exhibited mutual adaptation (emerging, mastery, and investment), findings center on when and how students co-opted or resisted the curriculum related to open access and authorship. The article concludes with implications for theory and practice and recommendations for practitioners interested in designing effective open pedagogy experiments and furthering doctoral students' adoption of open practices.

LIBRARY TRENDS, Vol. 69, No. 2, 2020 ("OER and the Academic Library," edited by Elizabeth Dill and Mary Ann Cullen), pp. 435–68.

Introduction

Open educational resources (OER) are free learning objects shared under an intellectual property license that explicitly allows others to retain, reuse, revise, remix, and redistribute them (Wiley 2014). Examples of OER include textbooks, videos, syllabi, and lectures shared under a Creative Commons license. OER advocacy is often centered on undergraduate students and instructors that teach undergraduates. This focus on undergraduates is logical: the OER movement is strategically centered on large lower-level courses where cost savings can be demonstrated. Even open pedagogy experiments, which ask students to create openly licensed materials in order to make learning more authentic and public, are generally offered only in undergraduate courses. As a result, there is little discussion in the library and information science (LIS) literature on approaches to and outcomes of using open pedagogy to teach doctoral students about OER. This appears to be a significant oversight in OER advocacy, as many doctoral students will enter the professoriate and will make choices about publishing in open access journals and utilizing OER in their own teaching.

This article describes the cocreation of doctoral-level curriculum for a public midwestern university's School of Education in which all three coauthors played instructional roles. Samuelson is associate professor of language and literacy education. She was the course instructor and devised the scheme for revising the course to include open pedagogy and the creation of open education resources. Frye serves as the library research liaison for faculty and students in education courses. Hare is the scholarly communication librarian and an expert in OER, open access, and Creative Commons. After discussions with students in a fall 2017 research seminar about how their research guides might be helpful to their peers outside of the course, we conferred how they integrate open pedagogy into the course by asking students to submit their final research guides to an OER.

The assignment we developed required doctoral students to curate resources for a team-based research guide assignment about a research methodology, chosen by the teams, and invited the students to contribute their research guides to an OER. This case study centers librarians as key instructional partners in the important work needed to make open pedagogy experiments successful: teaching students about evaluation, curation, and their rights as authors. The first part of the article details how we provided active mentoring on OER and infused information literacy concepts in the doctoral course by building a curriculum that includes video chalk talks, research consultations, a card sort activity, and intentional opportunities for student authorship. Our decisions involved in creating the curriculum are described in detail and curriculum materials are shared and openly licensed for other practitioners to build upon. The curriculum is valuable for practitioners interested in designing open pedagogy experiments for doctoral students and teaching doctoral students about

key conceptual information literacy concepts, both of which are somewhat uncharted territory.

The second part of the article draws on qualitative traditions to research the effectiveness of the curriculum. Our research serves as an introduction of McLaughlin's (1976) theoretical framework to LIS, analyzing how mutual adaptation, cooptation, and resistance are manifested in doctoral-level student learning related to OER and information literacy. Using two data sources—student discussion forums and course evaluations—we detail when students grasped content, when they misapplied the material, and when they resisted specific concepts. This research is helpful for understanding how librarians can address misconceptions and encourage doctoral students to adopt open practices in the future.

Theoretical Framework

McLaughlin (1976) theorized that successful, innovative curricular implementation is characterized by a dynamic process of *mutual adaptation.* Her articulation of mutual adaptation follows her coauthored study that documented 293 teaching innovations taking place inside classrooms (Berman 1974). From this research, McLaughlin articulated that successful classroom innovations were not entirely dependent on funding, resources, or curriculum materials; instead, the most important aspect to student outcomes was teacher implementation.

The theory of mutual adaptation challenged established assumptions about teacher implementation, which included beliefs about the ease of explaining new concepts and communicating them to teachers and administrators, the possibility of a limited or partial trial implementation, the ease of use of the innovation, the congruence of the innovation with existing values, and the assumption of the superiority of the innovation over practices that existed previously (McLaughlin 1976).

McLaughlin (1976) held that teacher implementation of new practices was an iterative process that reflects a flexible and adaptive view of teaching and learning, eschewing rigid or prescriptive models. The implementation process, while constantly in flux, was theorized as the product of interactive variables such as location, educational setting, methods of instruction, and goals of the innovation. McLaughlin classified the implementation process through three different interactions: mutual adaptation, cooptation, and non-implementation. In the paragraphs that follow, we explain these three interactions drawing on McLaughlin's definitions.

Mutual Adaptation

Mutual adaptation is the process of adjustment required for success. McLaughlin's (1976) work establishes that the successful implementation of educational development and innovation depends upon participants who learn new concepts, skills, and practices and then customize/engineer them for their own purposes, needs, contexts and strengths.

Cooptation

The second implementation process McLaughlin (1976) defined was *cooptation*. Standard curriculum approaches were maintained in these cases, and the innovation was adapted in order to fit the curriculum, institutional, or educator norms. The process failed, however, because the teachers did not customize the curriculum to their specific circumstances. The innovation was forced to fit into a curriculum or practice that already existed. McLaughlin pointed to a lack of ongoing professional support and discomfort with change as potential reasons that educators co-opted curriculum innovations.

Non-Implementation

The third process is *non-implementation*, described as educators overlooking or ignoring the opportunities for curriculum innovation. In McLaughlin's (1976) research, curriculum projects that failed during the process of adopting the innovation were described as non-implementing.

Mutual adaptation theory has been used to establish arguments related to teacher professional development (Fenstermacher 1978; Northfield and Ingvarson 1979; Remillard 2000) and school reform (Parker 1980; Jennings and Spillane 1996; Desimone 2013). While hundreds of papers have cited McLaughlin's work, only a few scholars have drawn on her mutual adaptation theory as a framework or guide for their studies (Leonardi and Staley 2018; Siskin 2016; McLaughlin 1990).

Although McLaughlin's (1976) work was originally focused on the implementation of teacher professional development, this study uses mutual adaptation to look at how doctoral students—many of whom have established careers as educators—used, ignored, or misunderstood practices introduced by the professor and librarians. McLaughlin's theory is largely absent from the LIS literature, even though it has an established reputation for impact in professional development implementation and school reform. In this article, we argue that mutual adaptation can also be applied to understand graduate student implementation of curriculum. We position McLaughlin's framework as an important tool for understanding students' responses to the written and taught curriculum. In the methodology section, which follows sections on research questions and literature review, we explain how we used McLaughlin's theory as a conceptual framework for analyzing our data and how we modified the framework to accommodate our analysis.

Research Questions

The article poses the following research questions:

- How does the process of mutual adaptation manifest itself when doctoral students are introduced to learning about OER and information literacy (if at all)?

- How do students co-opt or misunderstand curriculum on OER and information literacy concepts (if at all)?
- How do students exhibit resistance toward OER and information literacy instruction (if at all)?

The following literature review explores major themes of the article, including doctoral students' information literacy and participation in open pedagogy. Since several of the research questions for this study address student misconceptions, misapplication, and resistance, the literature review also addresses how little LIS researchers have explored when and how students resist learning about OER and information literacy. Following a short review of the pedagogical practices that were implemented in the doctoral course, we describe the setting and methods for the study, followed by our analysis and a discussion of implications for LIS practice.

Literature Review

Information Literacy

The Association of College and Research Libraries (ACRL) defines information literacy as "the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and in participating ethically in communities of learning" (ACRL 2016). This definition was expanded after the publication of the "Framework for Information Literacy for Higher Education" (hereafter Framework). The Framework replaced the "Information Literacy Competency Standards for Higher Education," developed fifteen years previously, deemphasizing students' mastery of specific skills and instead focusing on complex concepts. The Framework emphasizes the importance of students seeing themselves as contributors to scholarship (Information Has Value) by describing the specific responsibilities that authors have (Authority is Constructed and Contextual) and recognizing that "not having a fluency in the language and process of a discipline disempowers their ability to participate and engage" (Scholarship as Conversation, par. 29). The shift to the Framework propelled several librarians to further critical information literacy practices, which builds upon critical pedagogy and asks students to consider the inherent power structures involved in information creation and sharing (Tewell 2015).

Information Literacy and Doctoral Students

Information literacy is a well-developed area of the LIS literature, with thousands of articles written about the topic. This article is focused on the information literacy practices of doctoral students, specifically education students, and librarians' resulting outreach efforts. While the literature is less developed than that on undergraduate students and information lit-

eracy, there are several studies on graduate students' information-seeking behavior and awareness of library resources. In the field of education specifically, research dates back to Park's (1986) survey of students' information practices. Still, as Blummer, Watulak, and Kenton (2012) state, several of the studies investigating the information-seeking practices of graduate students are outdated, as they were conducted before the Internet fundamentally changed students' research practices. Furthermore, many do not encompass the concepts articulated in the 2016 Framework.

There are several commonalities across studies focused on graduate students' information literacy, regardless of methodology and sometimes discipline. For example, researchers have consistently found that graduate students are often not aware of the range of services librarians can offer (Moore and Singley 2019) and that a faculty member's endorsement is one of the most important factors for convincing students, specifically PhD students, of librarians' utility (Fleming-May and Yuro 2009). Sloan and McPhee (2013) theorize that students' lack of regular interaction with or awareness of librarians has the potential to be exponentially impactful. In other words, if graduate students and librarians do not see each other often, when they do meet, they are more likely to share new, critical information. However, Sloan and McPhee hold that information from a weaker tie, like a librarian, is not generally enacted or applied until stronger ties—in this case, faculty—endorse it. Finally, multiple studies have found that graduate students prefer flexible information literacy learning opportunities (for example, tutorials or videos) because of their hectic work and class schedules (Blummer, Watulak, and Kenton 2012).

A few studies within the LIS literature support the idea that students use their colleagues as information guides and mentors. For example, interviews with one hundred graduate students across disciplines found that 73 percent of students see their peers as a useful source of help in research endeavors (George et al. 2006). Green and Macauley's interviews with graduate students in the United States and Australia found that students "oftentimes viewed colleagues as highly proficient in tasks of information seeking" (2007, 325). However, the LIS literature holds that graduate students in the social sciences seem to be more isolated in their research endeavors. Earp's 2008 survey of 113 graduate students majoring in the field of education found that they were reluctant to seek help from their colleagues. Blummer, Watulak, and Kenton's 2012 study, which surveyed seventeen education graduate students, also found a resistance to consult classmates as a general trend. Finally, Sloan and McPhee's (2013) interviews of thirty-three social science graduate students found that only 9 percent seek help from peers. Therefore, intentionally designing assignments that expose doctoral social science students to their peers' expertise may be an important strategy for shifting these trends, making open pedagogy experiments even more useful.

Almost all of the studies on graduate students and information literacy heavily focus on information seeking, as evidenced by Catalano's 2013 synthesis of forty-eight studies on graduate student information use. For example, Sadler and Given (2007) found that graduate students generally knew how to use the catalog, interlibrary loan, and library databases. Chu and Law (2007) focused on graduate students' selection of specific education databases. Catalano (2010) highlighted graduate students' use of search strategies like Boolean and truncation, with limited discussion of their evaluation process.

Perhaps because many studies predate the creation of the Framework and ACRL's emphasis on conceptual information literacy, there is almost no discussion on how graduate students evaluate research, understand credibility and authority, contemplate how to share their own intellectual property, and gain the confidence needed to contribute to a scholarly conversation as a new researcher. Blummer, Watulak, and Kenton's (2012, 136) study of how education master's students use author credentials, peer-review journal status, and relevancy to determine authority is one of the only pieces of LIS literature on graduate students that grapples with higher-level information literacy concepts. Thus, overall, we have little knowledge of how graduate students engage with many concepts explored in the Framework. This case study starts to address this gap by synthesizing doctoral students' understandings and misconceptions about credibility and authority.

Open Pedagogy

In 2013, David Wiley posited that *open pedagogy*, or involving students in the creation of OER, could transform student engagement and learning. Wiley held that shifting away from "disposable assignments," where students are asked to complete a project that concludes once graded, toward open and public projects could inspire more authentic learning and extend the classroom (Wiley 2013, par. 4).

Since then, the term "open pedagogy" has been widely contested, with varied opinions on just how open student-created resources must be in order for the underlying pedagogy to be considered open pedagogy (Wiley and Hilton 2018). Bonica and colleagues (2018, 11) state that the most essential characteristic of open pedagogy is that it "combines self-direction with the use and creation of open educational resources." Education professors Baran and AlZoubi (2019, 386) argue that open pedagogy assignments "engage students with a broad audience, encourage students' participation in the creation of information, and promote communities and networks." DeRosa and Robinson (2017, 117) emphasize students' learning process when defining open pedagogy: "Students are expected to critique and contribute to the body of knowledge from which they are learning. In this sense, knowledge is less a product that has distinct begin-

ning and end points and is instead a process in which students can engage, ideally beyond the bounds of the course."

In this article, open pedagogy refers to student creation of OER, which often inherently challenges students to curate, evaluate, and author content that lives beyond the confines of a particular classroom, centering students as important contributors to the broader scholarly conversation. Our work embraces elements of all three of the definitions above.

It is important to note that open pedagogy experiments significantly overlap with librarians' information literacy goals and the dispositions articulated in the Framework. Reed and Meinke (2018) have identified specific information literacy frames that align with OER creation, including "Information Creation as Process" and "Scholarship as a Conversation." For example, before students can successfully author and publish new content in an OER, they must learn about evaluation, authority, intellectual property, and citation. This includes carefully considering how (or if) students would like their intellectual property to be openly licensed and in what way.

While open pedagogy is often immediately valuable to the world beyond the academy and is usually intrinsically motivating because activities live beyond the course (DeRosa and Robinson 2017; Bonica et al. 2018), the literature implies several challenges to implementation. DeRosa and Robinson (2017) have found that some students might not feel that their coursework is polished or sophisticated enough to be shared in a public space. This may inspire instructors to model sharing their writing in progress to students (DeRosa and Robinson 2017). Copyright constraints present another challenge. Because students' final projects will be openly licensed, instructors are required to spend additional time supporting students to find content that is in the public domain or shared under a Creative Commons license to include in the OER (or opt to only link out to sources hosted elsewhere). Some professors and students may feel limited in areas like art where images are central to students' analysis. Open pedagogy experiments also aim to shift power dynamics within a classroom, transforming the professor's or librarian's role from content expert to mentor, editor, coach, or advisor (Masterman 2016). The student/instructor dynamic can be difficult to transform, requiring instructional teams to be intentional about how they scaffold and grade open pedagogy assignments. Finally, when students are asked to complete their work in public spaces, privacy is a natural concern (DeRosa and Robinson 2017). Some instructors have given students the option to opt out of open pedagogy projects or use a pseudonym when completing projects (DeRosa and Robinson 2017; Bonica et al. 2018). However, there has not been a formal exploration of shifting the power dynamic so that students are given the option of *opting in* to open pedagogy assignments. This case study describes the merits of this model, particularly for doctoral students.

Open Pedagogy Experiments

There are several examples of open pedagogy experiments. In *A Guide to Making Open Textbooks with Students* (2017), Mays describes several open pedagogy case studies in a variety of disciplines, including art, Latin American literature, digital technology and culture, biology, and philosophy, among others. DeRosa and Robinson (2017) cite Wikipedia assignments, student video creation projects like the Noba Project, and a project DeRosa led to have students curate and annotate an Early American literature textbook as models for those interested in open pedagogy. The examples generally take place in small, upper-level undergraduate classes.

There are few examples of open pedagogy with graduate students. One is Baran and AlZoubi's (2019) open pedagogy experiment with six graduate students in a blended instructional technology course. They found that graduate students are an important audience to introduce to open practices, as their students stated that they were "motivated to implement open pedagogy practices in their future teaching environments" as a result (Baran and AlZoubi 2019, 388). Baran and AlZoubi recommend that instructors interested in doing open pedagogy at the doctoral level model sharing, work to develop students' understanding of open access and licensing, and provide feedback to students throughout the process. Al Abri and Dabbagh's 2019 study of a graduate-level instructional design course came to similar conclusions, finding that students appreciated the opportunity to share knowledge with others. Our work extends the literature that examines doctoral students' engagement in and response to open pedagogy experiments. In the data analysis and findings below, we further Baran and AlZoubi's (2019) claim that open pedagogy experiments develop students' understanding of open access and licensing.

Student Resistance and Misapplication

Core to the theoretical framework for this case study, McLaughlin's (1976) process of mutual adaptation, is identifying why students resist or fail to implement key concepts in their learning process. Examining which concepts students resist is an important first step in designing subsequent learning experiences that are more effective. Similarly, untangling when students misapply, oversimplify, or misunderstand content is foundational to formative assessment and improving student learning.

Studies on information literacy, open pedagogy, and open access that address student resistance and misapplication are scarce, possibly because librarians may not have the opportunity or access needed to assess student application of concepts (Douglas 2017). In the information literacy literature, Hinchliffe, Rand, and Collier (2018) drew from a report coauthored by *Library Journal* and Credo Reference as well as information gathered from interviews with first-year experience librarians to identify first-year students' common misconceptions about information literacy.

Similarly, Chisholm and Spencer (2019) created a rubric to evaluate first-year students' application of information literacy concepts in final papers, which identified common student misapplications. Both of these studies are limited to undergraduate students in their first-year experience, and while they address misconceptions, there is no discussion of students' opposition or resistance to concepts or instruction.

Similarly, the literature on open access and open pedagogy fails to address student resistance, though there is a more detailed discussion of student misconceptions. For example, Riehle and Hensley (2017) interviewed seventeen undergraduate students about scholarly communication concepts, which led them to conclude that students fail to assess the impact of their work and the legal issues inherent in publishing. Hare and Evanson (2018) conducted an assessment of over five hundred incoming freshmen's perceptions related to open access and information privilege, ultimately finding that some students did not understand that the library brokers access to scholarly literature and that some unaffiliated researchers cannot afford access. Pickton and McNight (2006) conducted interviews with thirty-four students about their institutional repository. The first half of these interviews asked students to define and discuss open access, the serials crisis, and digital repositories, which prompted the authors to describe student misunderstandings. Other studies assess student confidence related to open access and scholarly publishing but do not actually identify when and how students misapply content, particularly after a teaching intervention.

Our case study extends current work on information literacy and open pedagogy with doctoral students, and in particular the recent work of Riehle and Hensley (2017), Hare and Evanson (2018), and Hinchliffe, Rand, and Collier (2018), by synthesizing graduate student misapplication of or resistance to specific open access and information literacy concepts, ultimately providing insight on ways librarians can anticipate, observe, and potentially respond to them in instructional settings.

Methodology

In this section, we discuss how we iteratively and collaboratively developed an open pedagogy assignment for doctoral students and how we explored their reactions to open pedagogy, using qualitative research methods to investigate student discourse in online discussion forums and course evaluations through the lens of mutual adaptation theory (McLaughlin 1976).

Research Context

Most of the university's graduate programs require all of their doctoral students to complete a seminar that helps them pull together the theories, research methodologies, and content areas they have studied and prepare for their qualifying examinations and dissertation proposals. This

seminar invites students to develop and plan their theoretical frameworks, literature reviews, research questions, and data collection and analysis procedures for their dissertation research. Typically, there are ten to fifteen students enrolled; the seminar is offered in on-site and online formats.

Research Guides Assignment: Iterative and Collaborative Curriculum Design

When Samuelson was planning to teach the seminar for the first time, many of the doctoral students expressed that they wanted more preparation in research methodologies, particularly in the methodology that they hoped to use for their dissertation projects. To address these concerns, but to avoid turning the course into a review of research methods, she partnered with Frye and Hare to collaboratively and iteratively design a research guide assignment for the course. The research guide assignment would be completed by small groups before the midpoint in the semester. The research guides assignment asked students to locate and evaluate a variety of materials related to the study of a selected research methodology. The rationale was that creating a research guide would prepare them to take independent steps toward learning more about a specific research methodology that interested them. The assignment also enabled students to show their expertise in the methodology and to locate more materials that would help them to grow their expertise. Some of the research methodology topics selected by the students included various types of discourse analysis (critical discourse analysis, conversation analysis, multimodal), case study methodologies (single, multiple, ethnographic), education ethnography, and others. The assignment helped students accomplish the demanding foundational goals for the course: to craft a well-argued dissertation proposal and to review research methodologies and integrate them into their dissertation proposals. Ultimately, the assignment served as a context for inviting doctoral students to consider how scholarship is a conversation in which they build upon and respond to the research of others.

After discussions with students in the fall 2017 course about how their research guides might be helpful to their peers, we conferred over how the guides integrated open pedagogy into the course by asking students to submit their final research guides to an OER. The OER would be published using Pressbooks, which is freely provided to all university affiliates. Publishing the research guides as an OER could be useful to other learners and educators interested in a comprehensive overview of a particular methodology. However, we hoped that transitioning to an OER would also make the assignment more authentic to students as their research guides would actually be utilized by others. Incorporating open pedagogy also provided an exciting opportunity to teach students about publishing and Creative Commons, which is a strategic goal of the university library.

The design of the assignment was iterative and cumulative over three semesters, as we utilized student feedback to continually improve the curric-

Table 1. The history of the assignment redesign.

	Spring 2018 (in person), $n = 15$	Fall 2018 (online), $n = 13$	Spring 2019 (in person), $n = 6$
Librarian research consultations hosted face-to-face or electronically (students' choice)	Ongoing, based on when students scheduled the experience; sometimes multiple times	Ongoing, based on when students scheduled the experience; sometimes multiple times	Ongoing, based on when students scheduled the experience; sometimes multiple times
Open pedagogy assignment	Before midterm	Before midterm	Before midterm
Four chalk talks	N/A	Intermittent, every two or three weeks throughout semester	Intermittent, every two or three weeks throughout semester
Card sort activity	N/A	N/A	Midterm

ulum in preparation for students contributing to the OER. Table 1 details how the redesign progressed and notes when the activities took place each semester. In addition, all OER, chalk-talks, and instructional materials were published in the university's Institutional Repository, under a CC BY SA 4.0 license at https://scholarworks.iu.edu/dspace/handle/2022/23436. (These materials are listed individually in the references.)

Librarian Research Consultations

Frye held one-on-one, optional consultations with students about the research guide assignment starting in fall 2017. These were often structured around students' questions and information needs. These consultations were included in the syllabus by Samuelson, and Frye visited the class once to introduce herself to the students. In the subsequent semesters, Frye and Hare both participated in the online setting for the courses, and they led a class session in the course in the spring of 2019. Because the consultations were optional, comprehensive notes were not kept on their frequency or content.

Chalk Talks

Chalk talks are educational videos where an instructor explains a concept verbally while a sketch presents information visually. Beginning in fall 2018, we incorporated chalk talks on authority, credibility, copyright, and Creative Commons into the curriculum for the first time. The four initial chalk talks were "Credibility of Scholars" (Frye, Hare, and Samuelson 2019d), "Acknowledging Authorities" (Frye, Hare, and Samuelson 2019a), "Challenging Authorities" (Frye, Hare, and Samuelson 2019c), and "Your Intellectual Property" (Hare, Frye and Samuelson 2019). Over summer 2018, we had designed these chalk talks collaboratively and found

that using them challenged us to illustrate complex (and sometimes inaccessible) concepts, often requiring the use of metaphors or analogies that help students make connections. Since the chalk talks were in production in spring and summer 2018, we did not introduce them to the students until fall 2018 and spring 2019.

The chalk talks were introduced to students every two to three weeks throughout the semester, even after the research guides assignment was due. This is because the concepts covered in the videos not only were intended to help students complete the assignment but also offered important long-term professional development for students.

As a way to model open licensing to students, we shared the chalk talks under a Creative Commons license in the university's institutional repository. In summer 2019, we created three additional chalk talks on the topic of information privilege entitled "Transforming the Information Ecosystem," "Journals in Higher Education," and "Inequities in the Ecosystem."

Making Evaluation Visible through a Diamond Card Sort Activity

After receiving feedback in fall 2018 that the content from the chalk talks needed to be better integrated into the course, we designed a card sort activity for the spring 2019 on-campus class. Building upon Ritchhart, Church, and Morrison's 2011 work, the card sort prompted students to make their thoughts visible to a community of learners. Students were given thirteen cards, each with a different concept that could be meaningful in their evaluation process. Criteria were not defined for students; instead, they were asked to consider what the terms meant to them. Additionally, some criteria were purposefully ambiguous in order to solicit multiple interpretations and included broad concepts like authority, availability, comprehensiveness, and currency. Cost was included as a criterion, which led to an in-depth discussion about how information requires payment and how open access is one solution to the high cost of information. Finally, students were given three blank cards so that they could articulate criteria that were important to their process that were not represented in the card deck.

To do the card sort, students organized their cards in a diamond shape based on their process. The diamond sort was intentional, as the shape allowed students to put several criteria at both the top and the bottom, which emphasized the importance of flexible thinking. Everyone in the class was given the opportunity to view each other's work. In short, the card sort acted as an extension of the open classroom, as it centered student agency and empowered students to teach us and each other.

Because the card sort activity was created in response to students' feedback in the 2018 courses, it was only offered in the 2019 iteration of the course (see table 1 for additional details). This addition may have impacted the 2019 discussion forums and course evaluations. The cards

and accompanying slides are available in an institutional repository (Frye, Hare, and Samuelson 2019b).

Open Pedagogy

Finally, students contributed their research guides to an OER titled "Short Guides in Education Research Methodologies" (Alqahtani et al. 2019). The assignment design used an "opt in" model for student OER creation. Generally open pedagogy courses assume student participation, providing an "opt out" option only when students express concern about publishing their work openly. After courses were completed, the students could submit their research guides for publication only if they were interested. This design centered student agency by giving students the agency to decide whether or not to particvipate. It also aligned with graduate-level learning objectives, as students that submitted their guides were required to consult with their coauthors to read and sign a contract. This was an important exercise for future publication endeavors as it required coauthor agreement and knowledge of Creative Commons licensing. As mentioned previously, all chalk talks were shared openly in order to model Creative Commons licensing to students interested in the OER. Out of a total of thirty-four students, thirty-two opted to participate in the OER (94 percent).

Data Sources

The analysis for this article focuses on two data sources: student discussion forum posts and student feedback on final course evaluations. While other data sources were available for analysis, including the student-developed OER, student research proposals, and instructor and librarian reflections, we chose to focus on these two data sources because they center student perspectives on open access and information literacy. Discussion forums are low-stakes environments where students can discuss ideas, share the products of their work, and build community (Smith 2019). Research on discussion forums is extensive; the forums have been used as data sources to examine topics such as the efficacy of computer-mediated communication in providing high-quality instruction (Darabi et al. 2013; Johnson 2006; Schindler and Burkholder 2014). The qualitative comments made in the course evaluation instrument, which was distributed digitally at the end of the semester, provided a discursive space where students could share their anonymous feedback with their instructor as well as other administrators. Both served as data sources for examining student learning.

Our choice of these data sources reflect our theoretical framework. As described in the methodology section above, McLaughlin's (1976) theory of mutual adaptation attempts to understand how teachers can productively adopt innovations. As an innovation, open pedagogy not only is a mechanism for creating OER with students, but also provides reflective learning experiences as students discuss intellectual property, information

literacy concepts, and authorship issues firsthand. We felt that the discussion forum posts and qualitative feedback on course evaluations were the richest data sources for understanding how doctoral students in education exhibited mutual adaptation, cooptation, and resistance while working through how to adopt these new concepts into their own practices.

Discussion Forum Posts

In the second and third iterations of the course, Samuelson assigned discussion forums in which the students viewed and discussed the chalk talks in the Canvas course management system used by the university. Even though the fall cycle was taught online and the spring cycle was taught face-to-face, both used the same online discussion prompts. The questions that were posed for each of the four chalk talks are provided in the appendix. Each discussion forum remained open for posts for one week. Each of the resulting eight forums was saved in PDF format and divided into numbered paragraphs for an average of 5.2 coded paragraphs per student in each forum.

Instructor-Created Course Evaluation Questions

At the end of each semester, the students completed the final course evaluation, as they were accustomed to doing for all of their courses. The university allows instructors to create a limited number of additional questions, so Samuelson inserted two Likert-style questions and three open-response questions that she used for all three semesters. The open-response questions were as follows:

- What are some ways that the research guides project could be improved?
- How could the instructors have better integrated open access concepts (Creative Commons, intellectual property, sharing your work) into the course?
- What skills would you like to develop more in order to engage with others and contribute to your field of research?

Student responses to these open-response questions were also numbered and coded for an average of 1.2 paragraphs per student.

Data Analysis

We conducted both a thematic analysis while also quantitatively representing the categories that were represented. Drawing on McLaughlin's (1976) framework, we reviewed the posts from the eight discussion forums—a total of 422 paragraphs—and the course evaluations—a total of 39 paragraphs. Each paragraph was coded by two raters, using a codebook that we based on McLaughlin's concepts of mutual adaptation (MA), nonimplementation (NI), and cooptation (C) and our modifications and additions to these concepts. While conducting preliminary coding work, we added more codes to reflect the differences that we noted in the ways that

the students were responding to the concepts presented in the chalk talks. Mutual adaptation–mastery (MA-M) and mutual adaptation–emerging (MA-E) allowed us to account for ways in which the students showed stages of mutual adaptation. We also added codes for mutual adaptation–investing (MA-I), resisting (R), and agreeing (A). In the codebook in table 2, we define each of these codes, provide examples from the data, and provide the actual count across both data types. The calculations represent codes assigned by two coders (i.e., one paragraph could have two counts for resistance if both coders assigned it).

Table 2. Codebook for analysis of discussion forums and open-response course evaluation questions.

Code	Definition	Example	Count	Percentage
MA-M	Mutual adaptation–mastery Student demonstrates full understanding of the concepts, skills, and practices, and shows mastery by customizing or engineering them for their own purposes, needs, and strengths.	"The beauty of qualitative research is that we are expected to insert ourselves into our research by reflecting upon how our own positionality informs our study and even evolves throughout the research process. I think then, inherent in qualitative inquiry, is the notion that the researcher's perspective is valued, and our classes' emphasis on reflection have helped me feel confident in sharing my positionality as well as my theoretical perspectives."	117	12.6
MA-E	Mutual adaptation–emerging Student is working toward showing evidence of learning concepts, skills, and practices. Often applies *only part* of what was taught. Might express uncertainty.	"The experience of being a part of this ecosystem and realizing that my work can contribute is exciting and daunting. What's intimidating is taking into consideration all the different ways you can share your work, because if you sign off on your work being shared a certain way without understanding the full details, you could lose your rights."	511	55.1
MA-I	Mutual adaptation–investing Student offers suggestions for ways to improve instruction of the concepts, skills, and practices. This may be in response to an invitation for input and does not indicate that the student has reached full mastery.	"Maybe future students can add some key articles using a research method to the research guides? So the readers can quickly learn about how this method is used in an article? Just a list of references, I am not saying the future students are going to create an annotated bibliography for each article."	54	5.8

continued

Code	Definition	Example	Count	Percentage
C	Cooptation While attempting to apply or adapt concepts, skills, and practices, student shows evidence of *misalignment* or *misapplication* between the new material and their current understanding of the material.	"While I do lean towards creative commons, I also like the idea of commercial use because that means a greater audience is reading it. My whole goal as a researcher is to share what we know with anyone who is willing to listen, not only other researchers in the field. More fields need to interact together to push our research to the next step."	128	13.8
R	Resistance Student actively refuses new concepts, skills, and practices and may even provide an explanation for their refusal.	"I really want to start with the question of 'why'? Why does my work need to challenge authorities in the field? What if I agree with them and wish to simply further what they began?"	42	4.5
A	Agreement Student agrees with one or more students in the forum, without demonstrating any mastery or cooptation of the new concepts, skills, and practices.	"It's so nice to hear how you're thinking about it. I do find a lot of value in materialism/post-humanism, but, it does forget and further marginalize already marginalized populations. Still thinking through this, but it's so helpful to hear how you're thinking about it, too!"	76	8.2

Findings

We organize this section by presenting themes related to how the processes of mutual adaptation, cooptation, and resistance were manifested in the online discussion forums and course evaluations. The themes articulated below represent the emerging patterns in the data sources, based on multiple pieces of evidence, after significant content analysis. As a way to support the conclusions, we integrate direct student quotes from the data sources. They serve as a representation, not the entire body of student work that led us to the corresponding themes.

Mutual Adaptation

While mutual adaptation was a single code in McLaughlin's (1976) framework, we found that this concept needed to be further divided in order to capture the range of student mutual adaptation processes we observed. We saw the process of mutual adaptation happen at mastery or expert levels (MA-M), at emerging or introductory levels (MA-E), and as students invested in the future of the curriculum (MA-I). We ultimately found that

mutual adaptation happens across a spectrum, with many students exhibiting a developing but still incomplete understanding of concepts. These emerging students demonstrated uncertainty in the form of expressed feelings of intimidation, confusion, vulnerability, and/or ambiguity. We also concluded that investing in the course by making suggestions that would help others learn about open practices and information literacy is a form of mutual adaptation, as students must exhibit some level of mastery in order to make effective recommendations.

Our findings reveal prevalent mutual adaptation at the mastery and the emerging levels (MA-M and MA-E). We were encouraged that MA-M, representing 12.6 percent of the codes, was not more common. Had we seen higher rates of mastery, we would have been concerned that the curriculum was content that they had learned previously or was too easy for them. Some examples of mastery included students expressing a strong obligation to making their research available to communities outside of the academy (namely teachers) and students recognizing that their contributions are valuable and play a role in moving the scholarly conversation forward.

One overarching theme related to mastery was students' commitment to social justice, particularly when discussing open access. For example, one student commented,

> The systems that are being upheld within academia are sustaining marginalization and limiting who gets access to research. . . . For me, [open access to research] is about being open, collegial, sharing, generous and available to a larger audience. (Spring 2019 Discussion Forum on "Your Intellectual Property")

While the basics of open access were presented in the curriculum, this student's ability to connect access to research to larger systematic issues in academia is exemplary both because the student masters what was presented but also because they successfully extend this explanation.

Mutual adaptation at the emerging level was more prevalent (55.1 percent of the codes). Although these represented less sophisticated or complete instances of mutual adaptation, we viewed them as students' sincere engagement with the curriculum content. In these instances, students often grasped a single part of the curriculum, sometimes even successfully applying the content to their specific context, while simultaneously oversimplifying, conflating, or glossing over other pieces of the curriculum. For instance, a doctoral student expressed a strong understanding of the literature review, but felt uncertain about questioning or challenging the work of other researchers:

> What purpose do literature reviews serve? They force me to actually sit down and summarize and work with articles. They force me to consider what an article represents and why it would (or would not) be useful in supporting my research. It also helps me to weed through all of the

> articles that are out there that may or may not be useful. Lastly they help me in future research, because I have taken the time to parse through the material before, I have a better idea of which articles will support current work. As for how I disagree, I guess at this point I don't feel that I have established enough credibility to disagree. I do however sometimes use articles to counter each other. (i.e., XX states that . . . , however YY states that . . .) That is perhaps the closest I come to disagreeing with the research publicly. (Fall 2018 Discussion Forum on "Challenging Authorities")

Finally, comments coded as MA-I (only 5.8 percent of the total content analyzed) usually appeared as a response to the open-ended questions added to the student course evaluations, which asked students how the assignment and curriculum could be improved. For example, in response to a course evaluation question about how the research guides assignment could be improved, one student commented,

> Maybe future students can add some key articles using a research method to the research guides? So the readers can quickly learn about how this method is used in an article. (Spring 2019 "Final Course Evaluation")

While students were prompted to improve the curriculum, many of their suggestions were useful and demonstrated their existing understanding.

Cooptation

Students co-opted or misapplied new materials in a small percentage of their discussion forum posts and course evaluation feedback. Though only 13.8 percent of the data sources were coded as cooptation, we desired to understand what served as obstacles to student learning either from the curriculum or their own experiences. Through this analysis, we were able to revise or remix the curriculum to respond to students' needs and experiences. In addition, focusing on these instances is invaluable for practitioners that are attempting to build an inventory of misconceptions (Wiggins and McTighe 2005; Hinchliffe, Rand, and Collier 2018) as a precursor for building learning opportunities that address these misunderstandings head-on. The following sections hone in on cooptation in the discussion forums on open access and intellectual property, which is where it was most prevalent. Dispelling these myths with doctoral students could further students' open practices as they enter the professoriate.

Misalignment between curriculum and application. Cooptation revealed a second theme: *when the doctoral students extended the concepts, skills, and practices* in the curriculum to other relevant concepts within the information ecosystem, some students *misapplied or misaligned* the material within the discussion forum. Such instances of cooptation rarely occurred in isolation within each paragraph; rather, they were often found embedded within paragraphs also featuring mastery or emerging levels of mutual adapta-

tion. This exemplifies how learners assimilate new information into existing ideas, beliefs, and schemas. Topics students mis-transferred or misaligned included their current information access/privilege, copyright, publishers, and venues to spotlight publications such as ResearchGate.

For example, one doctoral student misclassified ResearchGate as an open repository used for increasing visibility. She claimed,

> I have an account on ResearchGate and I frequently see people posting proofs or full text of their work as a way to get it out there before a journal is available or as a way to get more eyes on it. (Fall 2018 Discussion Forum on "Your Intellectual Property")

Although our taught curriculum mentioned the increased citations that papers published in both scholarly journals and open repositories are more visible and consequently often cited at higher levels, we did not associate ResearchGate with open repositories or notions of visibility.

In addition, while learning about author rights and choices about copyright, the same student viewed authors affiliated with ResearchGate as having the authority (copyright) to share all of their works to anyone who privately requested them. She explained, "I also think ResearchGate is a useful tool for contacting authors directly if you cannot access that perfect article" (Fall 2018 Discussion Forum on "Your Intellectual Property"). Although ResearchGate was not an overt component of the chalk talk videos or the discussion forum prompts, it was already a relevant part of the doctoral student's publishing process and served as a way for her to apply course concepts to something meaningful to her.

Another student extended our discussion of the benefits of publishing open access with financial, institutional perks. She anticipated that as a professor she would receive compensation from the university for publishing research articles in what she perceived as open resources. She shared, "What is exciting is the pay and points I'll get from my university for publishing in Scopus or SSCI journals" (Fall 2018 Discussion Forum on "Your Intellectual Property"). Although we stressed scholarly impact and equalizing privilege as potential benefits for publishing in/through open venues, the student anticipated the benefits to include financial compensation. Furthermore, the student continued to exhibit cooptation as she mis-transferred the concept of a preprint in an open repository with an unpublished work. She articulated, "I am eager to see how I can work some of my published and unpublished pieces into those . . . Mendelay [*sic*], Academia, and ResearchGate" (Fall 2018 Discussion Forum on "Your Intellectual Property"). Although we discussed how preprints are uploaded in open repositories when postprints and publisher's versions are not available, these additional author tools were not mentioned in the written or taught curriculum for this course. Rather, the student drew upon concepts we introduced and inappropriately overlaid them onto the content she found relevant from other coursework.

Views of Academic Publishing. Cooptation data also revealed a third theme: *doctoral students propagated viewpoints of academic publishing* that conflicted with both our written and taught curriculum. The themes we observed, along with selected students' views, are featured in table 3.

As explained by Laughtin-Dunker (2014), librarians often associate these viewpoints with faculty members; however, our data reveal that these beliefs exist in doctoral students before they ever reach the professoriate. While the majority of these expressions were not considered dominant viewpoints, none of them were challenged or corrected by other students in the discussion forums. While cooptation was the dominant code for the findings related to these themes, there is resistance associated with some students' viewpoints. In some cases, students' underlying resistance motivated their cooptation. For example, students that had negative experiences with publishers already may be more likely to misapply new material with their current understanding.

Table 3. Emerging subthemes on views of academic publishing, with data excerpts.

Themes	Data excerpts
Publishing OA is just an early step to establishing one's academic reputation	"I think that in the beginning, I'd like to share my work within creative commons/open access . . . with an embargo, so that I make a name for myself as an educational researcher and practitioner."
OA research does not utilize the same standards as other research	"Putting out scholarly work as open access likely means that it has not been refereed and there could be serious doubts about its validity and reliability (or credibility and trustworthiness). To me, as a novice research consumer, I need to know that someone who is an expert has seen it and approved, or better yet several experts have looked at the work and judged it to be worthy."
OA may not include high impact journals	"I would feel very confident explaining to hiring committees or others in academia that I have chosen to go open access because it is a moral responsibility. If they didn't accept that, then clearly they wouldn't be an institution that I would care to work within."
Practitioner journals are not research journals	"I have published four articles in my life, all in non-scholarly publications; three were in [specific practitioner journal title]."
Publishers are adversaries	"Honestly, I think publishing companies tend to be pretty horrific for a multitude of reasons, and I hope to avoid publishing with them. . . . Most publishing companies are, in my opinion, capitalism at its worst—all about making a profit with little to no interest in supporting their writers or in disseminating information at reasonable costs."

Resistance

We found that discussion forum content featuring resistance to the concepts in the curriculum represented less than 5 percent of the total codes. While student resistance was rare, when it occurred it was powerful and appeared to be infectious, prompting other students on the forum to resist the same key concepts in the curriculum. The following section synthesizes trends in how students resist and could inform the design of open pedagogy experiments.

Resisting Scholarly Identities. Data coded as resistance revealed one final theme from all the discussion forums: a number of doctoral students showed resistance toward their status as emerging scholars and the responsibilities associated with that identity. Chalk talk content acknowledged students' place as authors, and a few doctoral students shared the ways in which their work (e.g., self-published children's books, coauthored publications with professors) had contributed to or shaped their discipline. Yet even with curriculum and other student voices that positioned students as scholars, the data revealed that students expressed a lack of confidence associated with this role for a variety of reasons. Table 4 organizes into subthemes the students' expressed feelings when they exhibited resistance to their status as emerging scholars.

The data reveal that when these feelings were present, and students did not yet identify as scholars, they resisted the associated directives in the discussion forums, including opportunities to challenge authorities, choose a preferred Creative Commons license, or take a position on copyright.

Discussion

The following section explores our findings, providing more detailed information on why each trend may have occurred and connecting that trend to the broader LIS literature. Doctoral students expressed a commitment to social justice as a reason for supporting open access. One reason for this finding certainly has to do with the research focus of many of the faculty in the department where this course is taught. Samuelson has indicated several times that she believes that her research should be available to the people who contributed to it, so it should be open access whenever possible. It is possible that Samuelson and her department at large are a representation of Sloan and McPhee's (2013) argument that positions professors as strong(er) influencers of students as they determine what counts as knowledge and what is important in the written and taught curriculum. In this case, the professors endorsed strong conceptual ties related to social justice; ultimately, this may have had an influence on doctoral students' championing of open access. Although Sloan and McPhee position humans, specifically course professors, as powerful influencers

Table 4. Emerging subthemes on resistance to scholarly identities, with data excerpts.

Subthemes: Students' expressed feelings	Data excerpts
Students expressed feeling intimidated about engaging the activities of academic scholars	"I am always too intimidated to . . . reach out by e-mail to researchers. What do I have to offer these busy people? What if [through their critique] my ideas are broken into useless pieces [and their comments] don't help me move forward? Criticism is good, but . . . I feel like I'm barely hanging in there." "If I were in a professorship where the pressure to publish was high, I think I'd be a lot more intimidated with the process, and likely to be completely disappointed if my work was not accepted." "I hesitate to join the conversation unless I feel that I have very solid knowledge on the topic or rich experiences."
Students expressed feeling uncomfortable about becoming scholars	"In my experience, the imposter sensations don't go away easily, but a certain level of comfort does settle in. I have found that there are communities of scholars that behave as closed camps, though, and this can compound levels of discomfort. The chalk talk seems to assume that the new scholars will be welcome and won't be given a hazing, but this does happen, too." "My comfort level with throwing my ideas into an arena of scholars is low. I have just started to understand how to research and how to write like an academic."
Students expressed feeling underprepared (academically or emotionally) for becoming scholars	"I lack a bit of confidence to 'join' the conversation by putting my own work out there. In particular, I lack confidence in my academic writing skills and my ability to use theory consistently to back up my claims and ideas, but I think as I gain experience that my confidence will increase and so too will my ability to talk confidently about my research." "I feel less confident about my abilities to publish articles or contribute to book chapters, but seeing as I have no prior experience with either, I suppose I don't really know if I could do it or not." "I would break down if someone tore apart my published piece, especially the dissertation."

if/when students connect with the information literacy curriculum, our data lead us to also postulate that common ideological orientations (e.g., social justice) may be a compelling tie of influence in its own right, even without professor endorsement. It is also worth noting that many of the doctoral students have experience as teachers, which may explain their passion for ensuring that practitioners and community members can ac-

cess research. The Language, Culture, and Literacy Education program also inherently has an international dimension, so students may readily connect with the idea that certain countries have less access than others.

When doctoral students misapplied or misaligned the concepts, skills, and practices in the curriculum to other relevant concepts within the information ecosystem, they tapped into previous experiences. While they were enthusiastic about the content, they often drew from previous experience or examples of faculty in the department, even when it was not completely relevant. For example, some students drew upon their experiences with other kinds of publishing, including book and magazine publishing, which often have different protocols. This process is a natural part of sensemaking and is not necessarily a negative aspect, as the students are trying to apply new material. However, if misalignment occurs, there can be missed opportunities to intervene. In the context of the asynchronous discussion forum, a misalignment, once posted, could encourage other students to further the discussion thread, especially if they are valuing their colleagues' thinking. While this seems contrary to Earp (2008), Blummer, Watulak, and Kenton (2012), and Sloan and McPhee's (2013) findings that education graduate students do not rely on colleagues, it appears that at least in these discussion forums, they were building upon each other's work, albeit sometimes negatively.

Doctoral students also propagated viewpoints of academic publishing that conflicted with both our written and taught curriculum. There could be several logistical reasons for this: the medium (discussion forums) seems to encourage low-stakes, casual conversations among students, which sometimes led to oversimplification of concepts. Students' misapplication of concepts may be a result of how brief the curriculum was as well. Chalk talk videos were intentionally designed to be less than two minutes long, and generally, the instruction on information literacy and open access was supplementary. In other words, students were balancing several other learning objectives while they were learning this content, and often the short curriculum did not dive into the complexities. Limited time and space are challenges that librarians interested in teaching these concepts must continually consider in their design. However, the misconceptions we identified further Riehle and Hensley (2017), Hare and Evanson (2018), and Pickton and McNight's (2006) work on student misconceptions related to open access. They demonstrate that students are not receiving enough preparation on these concepts as undergraduate students and are often (sometimes suddenly) expected to know this content as graduate students. As an example, we found that doctoral students' knowledge of copyright and intellectual property is introductory, similar to what Riehle and Hensley (2017) found when surveying undergraduate students. Finally, student attitudes and understanding of open access are inherently reflective of the broader academy, as they often receive this

information either explicitly or implicitly from their mentors and/or guidance they get about where to publish or what to prioritize.

Finally, doctoral students showed resistance toward their status as emerging scholars and the responsibilities associated with that identity. We speculate that some student resistance was related to our linguistic choices in our curriculum and the discussion forums. For example, we utilized the Framework's language on challenging authorities as a title for one of our chalk talks. Had we used a less provocative title for the chalk talk (i.e., extend, remix, question), students may have been more receptive to the notion. At the same time, we articulated less provocative approaches to challenge authorities in the narrative and visuals of the chalk talk, so students who viewed the chalk talk in its entirety were introduced to a range of approaches.

Perhaps more significant than our linguistic choices was our (the librarians') logic related to the students' timeline for their dissertation. *If* students were drafting their preproposals for their dissertation by the end of this course, *then* they recognized their emerging role and responsibility to make contributions to the scholarly ecosystem by extending, remixing, and challenging authorities. Because of our presumption, we failed to build responsive curricula that scaffolded the Framework's dispositions related to how scholars converse in the ecosystem, and more specifically how they construct their authority. Part of this scaffold, we realized, should include a social-emotional dimension of learning, which is nearly neglected in the Information Literacy Framework. While the Framework mentions the development of authoritative voices, the mention is overpowered in the same knowledge practice by learner responsibilities. We believe our students, and ultimately our curriculum and the Framework, neglected to untangle the relationship between contributing to the ecosystem and the overwhelming responsibility it entails. Perhaps this neglect is the reason students distanced themselves from their readiness to and interest in challenging authorities. Particularly in classrooms that embrace open pedagogy, instructional teams may need to more aptly differentiate the notion of students as valuable contributors from their responsibilities. As we mentor doctoral students as contributors to the scholarly conversation, we cannot fail to build both written and taught curriculum that responds to the social emotional barriers and disempowering systems that hinder students' confidence to contribute.

Implications for Theory

McLaughlin's (1976) theory of mutual adaptation served as a starting place for us to analyze students' responses to the written and taught OER and information literacy curriculum. Our findings suggest that the theory, in its original state, cannot apply to doctoral students' learning. Based on the findings of this study, we recommend the expansion of the *mutual*

adaptation framework to express a larger range of ability, including both emerging and mastery ranges. As is, the theory best applies to cooptation, though it was represented infrequently in our data. Even so, analyzing the presence of cooptation is instrumental to considering and implementing revisions. Because our data sources only provided opportunities for students to articulate their *plans* to implement, we offer *resistance* as another addition to the original theory, as an alternative to McLaughlin's *non-implementation*. This study indicates that students formally and informally resisted curriculum, perhaps as a precursor to non-implementation.

Implications for Practice

While it is not possible to make generalizations about theory or practice from a small data set from thirty-four doctoral students, the results of these data do yield insights into how librarians can contribute to courses that embrace open pedagogy and integrate information literacy components, including open access, as part of the curriculum. We offer the following insights as a starting place upon which scholarly communication, instruction, and liaison librarians can build a meaningful curriculum in open classrooms designed with faculty members for doctoral student learning.

Build upon existing student values. As discussed above, when we analyzed instances of mutual adaptation, particularly mastery, students expressed a commitment to social justice. Thus, framing access to research and even incorporating less represented authorities in scholarship as justice issues was an effective pedagogical strategy for reaching doctoral students. Instructional teams should consider emphasizing inequities and student agency in making change when designing curriculum.

Address previously constructed beliefs. A major finding of our analysis of student cooptation and resistance was that we needed to better understand students' experiences and existing knowledge *before* constructing the curriculum. We recommend conducting preassessments to understand what students already know in order to make any curriculum on open access and information literacy as tailored as possible. This kind of assessment would have been invaluable for addressing student misconceptions about ResearchGate, for example.

Determining what students already know is also helpful for addressing a significant barrier to successful open pedagogy experiments: student confidence. One of our major findings was that students felt that they did not belong in the academy or were not yet scholars, perhaps because of a lack of emphasis on the social-emotional dimensions of being an author and contributor. Those building curricula that introduce graduate students to strategies for entering the scholarly conversation, developing open practices, and publishing should see student confidence building as an

integral precursor. Assessing what students already know and lifting that up as important, even if it could be improved, is an important first step in this process. We recommend that instructors take a "yes, and" approach whenever possible, opting to explain the complexities of open access while simultaneously honoring students' existing knowledge.

Finally, instructors can address some of the student misconceptions we have identified above by making these concepts more recognizable for students. For example, when students express that they are not yet scholars and thus do not need to consider a specific concept, instructors could demonstrate how they are already an important part of the scholarly conversation. Similarly, instructional teams should draw upon the existing literature that demonstrates the trust graduate students put in their professors and mentors (Sloan and McPhee 2013) and work to spotlight professor narratives within their department or school. For example, there are several professors in the School of Education that publish in top-tier journals while simultaneously self-archiving a version of their work. We could have better showcased both pre-tenured and established professor practices in order to encourage students to see open access as attainable.

Reframe perceptions of success. When we began the process of coding, we anticipated that codes related to mutual adaptation would serve as a gauge for the success of the curriculum. As we spent more time with the data that we originally ascribed to missed opportunities for student learning, we realized the importance of reframing our perceptions of how success manifested itself in student products. We found this especially to be true for data we coded as cooptation and resistance. For example, while on face value cooptation seems to signal a misunderstanding, it also often means the student is trying and sensemaking. Many of the examples that we coded demonstrated that even when students got something "wrong," they were genuinely attempting to reconcile the new content with their existing knowledge.

Similarly, student resistance should be reframed as an important learning opportunity for instructional teams. We suspect that student resistance is underdiscussed in the LIS literature because it is seen as a failing. Instead, we found that by redesigning the course to be based on open pedagogy assignment and, in doing so, attempting to dismantle existing power structures, we actually invited resistance. Likewise, an entire section of the Framework is devoted to authority and in many ways encourages autonomous student thought. Even though we designed the open pedagogy component, we were unprepared for the surprise of students' resistance. We ultimately changed this stance, deciding that it is fruitful for students (particularly at the doctoral level) to resist and that resistance could even help them grow as scholars that will need to challenge existing authorities. We recommend that librarians involved in open pedagogy experiments

be open to student resistance and share experiences of resistance more openly in the literature so that we can better understand this trend. In a similar vein, while we did not do a detailed analysis of when students invested in the course by making recommendations for improvement (MA-I), it is also important to reframe these comments. While they are inherently critiques of the course and assignments, they are also expert recommendations for improving future student learning. These comments signal an investment on students' part.

Finally, we used the chalk talks and designed the open pedagogy experiment as mechanisms for sustainable instructional design, especially for librarians involved in the course. We thought that, by creating a curriculum that students could engage with asynchronously outside of class time, we would reduce the amount of planning and instruction librarians would need to do live. Similarly, we hired an editor to compile the OER, perform light editing, and keep records of student copyright agreements to reduce the burden on the instructional team. We instead found that integrating open pedagogy and more in-depth information literacy materials resulted in many new opportunities to engage with students, clarify concepts, and correct misunderstandings. Practitioners that see open pedagogy as student-led, and thus less work, will find that this is not true. The design is simply different from a lecture-based course, which means that it often requires more scaffolding and preparation to make it effective and meaningful to students. It can also enhance librarians' relationships with students, ultimately leading to more information literacy consultations and additional questions about open access and specific publishing opportunities. These are exciting opportunities; however, librarians must figure out how to make this kind of outreach sustainable and balance it with their existing workload. Further conversation about the sustainability of open pedagogy experiments is needed in the LIS literature.

Limitations

Our study is limited by a few factors. Based on the course enrollment, we had a small group of participants who were all affiliated with the same institution, discipline, and program ($N = 34$). In addition, students were informed that we had dual roles as instructors and researchers. Our identities as researchers in the course may have affected their participation either positively or negatively.

We saw some interesting trends in the differences between the online cohort ($n = 13$) and the two on-campus cohorts ($n = 21$), but due to the small sample size, we did not analyze the cohorts separately. For instance, we noted that the majority of the codes associated with resistance came from the online cohort in fall of 2018. We determined that additional data would be needed to understand why resistance might be more prominent with an online cohort.

Future Research

We have identified some areas that we feel are open to future research. For instance, we were curious to know whether the doctoral students actually used open resources in their research proposals and how they perceived the variety of open licenses available to them for their work and we plan to assess the student-created OER in the future. Why did students choose to opt in or opt out of contributing to the OER? Further investigation into resistance and cooptation of open pedagogy should be a priority area of future research to better understand how future educators perceive open practices and how they might incorporate them into their work and teaching.

For instance, we were very curious about the "non-implementation" of curricular innovation (as described by McLaughlin), but we felt that we could not actually assess it in our dataset because we would need to look at the future OER work of our students. This type of research would move beyond assessing basic understanding of open access and its importance toward assessing actual practices.

Conclusion

Our study provides strategies that librarians and instructors can use to help doctoral students become interested in adopting ever-increasingly important open practices as they become faculty members. In the spirit of openness and sharing, we described and openly licensed our curriculum package for other educators to adapt and build upon.

In addition to describing our curriculum, we examined students' perceptions of open pedagogy and information literacy concepts throughout the course redesign process. Using McLaughlin's (1976) framework, we conducted a close analysis of student discussions and course evaluations. This analysis is useful for practitioners interested in developing similar learning experiences, as these data illuminate common student misconceptions and misapplications. In addition to analyzing how mutual adaptation, cooptation, and resistance are manifested in doctoral-level student learning related to OER and information literacy, we have also introduced and extended McLaughlin's framework to LIS. Furthermore, our study substantiates the application of McLaughlin's theory into arenas beyond innovation in teacher professional development, specifically to innovations in doctoral-level LIS-related curriculum.

Our investigation is founded on the belief that open pedagogy prioritizes process over product. We found that McLaughlin's (1976) theory of mutual adaptation aligns with this core tenant of open pedagogy and that both emphasize iteration and continual change. Perhaps one of our most important findings is that as practitioners we must be open to student resistance and even develop an understanding of how resistance toward the taught curriculum can be useful with positive implications for their learning. We have embraced resistance as a requirement for successfully doing

open pedagogy, particularly at the doctoral level. We have also found that it is an important precursor to creating a vibrant intellectual community of practice where honest feedback and iteration are both welcomed and valued.

Appendix

Discussion Questions for Credibility of Scholars

After you've watched this video, please join the conversation about how you see yourself fitting into the knowledge ecosystem as you develop your ideas and make your contributions. Here are some questions to get you started:

How comfortable are you with the idea of fitting your scholarship into an ongoing conversation among scholars? How do you envision yourself going about this? How do you get started?

Your perspectives are important, and other scholars are paying attention. How has your scholarly training so far helped you to see yourself as someone who has valuable contributions to make?

How far can your scholarship travel? How can you imagine having an impact through your work?

What does it mean to be credible as a scholar? How do you evaluate the credibility of the other scholars? How can you establish your own credibility?

Discussion Questions for Acknowledgment of Authorities

This video discusses the philosophical importance of the literature review, but also the functional purpose. It's a central place any scholar can utilize as a jumping off point for their own research.

When has a literature review served this purpose for you as you were learning about a concept, idea, or theory?

What kinds of "leads" has it given you in addition to citations?

One part of acknowledging authorities that the video touched upon is disagreeing with other academics, even when they are established or considered expert. What does this look like in your own work? How do you use disagreement or critique to constructively further conversation?

Discussion Questions for Challenging Authorities

Where do you see your work in challenging authorities and moving the conversation forward in your field?

How do you interact with and contribute to the information ecosystem in your work?

Discussion Questions for Your Intellectual Property

Have you ever had to sign a copyright agreement? If so, was it a transfer or did you grant a license to the publisher? How did you feel about this experience?

What excites you about sharing your work formally in the information ecosystem? What's still intimidating or unclear about sharing your work?

Explore the Creative Commons License generator. Which license(s) align with how you want your work to be used by others? What questions do you still have about copyright and your intellectual property?

Acknowledgments

Our work was made possible by a Technology Challenge Development Grant from the Indiana University School of Education. We also gratefully acknowledge the support provided by a grant from the Jay Information Literacy Fund, courtesy of Hilda and Ellen Jay. Finally, our understanding of mutual adaptation was greatly influenced by our conversations with David J. Flinders and Jeffrey Anderson. Both served as eager listeners and generous thought partners. We are particularly grateful to Dave for including McLaughlin's original work in his anthology (Flinders and Thornton 2009).

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