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## Supporting open information literacy via hybridised design experiments

Kristen Rebmann  
*San Jose State University*, [kristen.rebmann@sjsu.edu](mailto:kristen.rebmann@sjsu.edu)

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# Supporting open information literacy via hybridised design experiments

Kristen Radsliff Rebmann, Associate Professor, San José State University. Email: [kristen.rebmann@sjsu.edu](mailto:kristen.rebmann@sjsu.edu)

## Abstract

This report discusses a project that forms connections between design experiment and informed learning approaches to designing learning activities supportive of open information literacy and scholarly communication among library and information science graduate students. Open information literacy is defined as information literacy relating specifically toward leveraging open access and open educational resources. Focus is placed on implications for research and practice by exploring one example of a hybridised, informed learning design experiment that fused subject content and open information practice. This project report represents an early step in thinking about the possibilities of infusing informed learning research structures and strategies with design experiments.

## Keywords

Blogging; design experiment; information literacy; informed learning; learning design; open access

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## 1. Introduction

This project report discusses efforts to form connections between design experiment and informed learning approaches to designing open literacy events. The project discussed involves the design of learning activities supportive of open information literacy and blog-based scholarly communication among library and information science graduate students. Open information literacy is defined as competencies relating specifically toward leveraging open access and open educational resources. Focus is placed on implications for research and practice by exploring one example of a hybridised approach to learning design: one that combines a design experiment approach to project structure with an informed learning-inspired fusion of subject content and open information practice. The robust methodological structures in the phenomenographic and informed learning frameworks have much to offer to extend design research. It is my hope that discussion here will represent a starting point toward infusing the field of informed learning with strategies associated with design experiment research. Far from picking winners and losers, this project's aim is to extend both frameworks in new directions and begin a robust conversation about theory, methods, and units of analyses.

With these ideas in mind, the report explores two questions and offers a report on early efforts to combine design experiment and informed learning approaches to learning design:

1. How might design experiment research practices have an impact on informed learning inspired designs?
2. How can hybridised design experiments (as learning designs) support open information literacy?

## 1.1 Design experiment research

Design experiment research was first introduced in Ann Brown's 1992 educational study. Her research involved the design, development, and evaluation of educational interventions with the goal of contextualising these activities within (and responsive to the contingencies of) local goals and practices. Later work by the Design-Based Research Collective (2003) and Dede, Nelson, Ketelhut, Clarke and Bowman (2004) extended Brown's work in new directions by exploring innovations and the reasons why (and how) they work in practice. Wang and Hannafin's (2005, p.7) work defines several critical dimensions and characteristics of design experiment research:

- Often conducted within a single setting over a long time.
- Iterative cycles of design, enactment, analysis, and redesign.
- Contextually dependent interventions.
- Document[s] and connect[s] outcomes with development process and the authentic setting.
- Collaboration between practitioners and researchers.
- Lead[s] to the development of knowledge that can be used in practice and can inform practitioners and other designers.

Nicolopoulou and Cole (2010) emphasise the importance of the learning ecology as a critical context for designs:

First, design-based experiments aim at understanding the learning ecology conceived as a complex interacting system involving multiple elements of different types and levels that function together to support learning. (p.61)

For these researchers, similar to Wang and Hannafin (2005), the role of iterative intervention design is critical to understanding how learning activities are relevant to learners. Central to the design experiment approach to research is the emphasis on long timescales of activity. Those creating design experiments structure their projects so that activity proceeds along long periods of time. Essentially, several iterations of the project are built into the plan along with several iterations of analyses and modifications of the learning design activity. The dual role of the instructor as designer/researcher, the iterative process of design, and the exploration of outcomes as a matter of learner development are central considerations.

## 1.2 Informed learning

As a pedagogical approach to information literacy design, informed learning attempts to fuse subject content with information practices (Bruce & Hughes, 2010; Bruce, Hughes & Somerville, 2012; Bruce, Somerville, Stoodley & Partridge, 2013). Informed learning likewise seeks to create contexts where students experience and engage with new disciplines and information practices in relevant ways supportive of deep learning. Recent work infuses informed learning with social living labs as a unique context for design of information literacy design (Hughes, Foth, Dezuanni & Mallan, 2017). In 2013, researchers (Maybee, Bruce, Lupton & Rebmann, 2013) adopted the position that more powerful learning emerges when core curricular content is taught simultaneously with competencies related to information use.

Informed learning as a design framework places focus on understanding the experience of the learner in response to intervention modifications (e.g. Dawes 2017; Hughes & Bruce, 2013; Somerville, Imhof, Bruce & Sayyad Abdi, 2017). In her 2008 book, Christine Bruce defines three core principles of informed learning:

1. Takes into account learners' experiences of information use and learning.
2. Promotes simultaneous learning about information use and a particular topic.

3. Brings about changes in learners' experience of information use and understanding of the topic. (Hughes et al., 2017)

Informed learning methods share several characteristics with design experiments, such as the design/observation of settings and interventions to understand learning outcomes, contextualised interventions, collaborations between researchers and scholars, and the goal of creating knowledge relevant to instructional practice. The focus on design and several new avenues of informed learning research are highlighted in Bruce, Demasson, Hughes, Lupton, Sayyad Abdi, Maybee, Somerville & Mirijamdotter (2017). According to Bruce et al., key new ideas, directions, and their research leaders include: "The expressive window for IL (Mandy Lupton); information experience design (Elham Sayyad Abdi); cross-contextuality and experienced identity (Andrew Demasson); informed learning design (Clarence Maybee); spaces for inclusive informed learning (Hilary Hughes); and informed systems (Mary Somerville and Anita Mirijamdotter)" (Bruce et al., 2017, p.4).

### **1.3 How might changes in timescales and iterative cycles of design impact informed learning designs?**

Informed learning design interventions are frequently introduced into learning settings and analyses directly follow without a second iteration (necessarily) planned as part of the overall project design. Findings and analyses focus on the intervention and how it impacts the learners' experiences of information practice and curricular content. The relationship between informed learning approaches and their phenomenographic heritage create a research context where experience represents the core unit of analysis. A design experiment approach shifts the intervention trajectory by extending the observational period of the intervention through the infusion of moments of reflection, redesign, and interaction with learners.

In iterative design cycles, the horizon for observation is expanded to include several iterations of a modified intervention. Modifications emerge as researchers process the impact of design characteristics in dialogue with learners and practitioners. Experiences of an informed learning design can be impacted and shaped by a multiphasic approach where:

1. The artifact or activity is initially introduced and experienced by learners, researchers, and practitioners.
2. Dialogues among stakeholders regarding experiences of the intervention are used to inform design modifications.
3. Modifications are introduced and re-experienced as a second iteration of the project.
4. Findings and conclusions are drawn to communicate the design's relevance to learners and potential for sustainability.
5. The project may experience additional iterations of activity or findings may be used to inform curricular changes more broadly implemented.

## **2. Research strategy: reporting on a hybridised design experiment**

Graduate education in library and information science (LIS) places great emphasis on new information and communication technologies (ICTs) as a set of tools and a professional context for students to learn about conducting research, engaging in scholarly communication, and managing information access and inclusion. In 2017, I and a colleague outlined our efforts at creating a learning design that supported student competencies in the areas of conducting research using the open access (LIS) literature and engaging in collaborative blogging activities to review articles relating to course content (Rebmann & Clark, 2017). Focus in the first publication was on the impact of collaborative blogging as part of online coursework in library and information science. Here, I offer this project as an example of an attempt to create a hybridised informed learning design "experiment". The project employs a design experiment research strategy which happens to fuse information practices with subject content in ways

common to informed learning. The project sought to connect online graduate students in LIS with literacies relating to:

1. Conducting research in open access journals supportive of several curricular content areas.
2. Engaging in scholarly communication via blogging activities.

## 2.1 Setting and learning design activities

Graduate students in six distance LIS courses participated in an open access literature searching activity and collaborative blogging project. Students were enrolled in four sections of two LIS courses. The first iteration was a course related to the design of library programmes and services for culturally and economically diverse populations. The second iteration was a course relating to learning design supportive of various forms of new literacies. Students formed peer groups of three to five and were called to search the open access literature in library and information science for articles relating to the curricular content associated with their course. Open access refers to dissemination of research via one of two main publishing models. In the first model, open access gold, journals are freely available and publish articles without charging either authors or readers. Publishers in the green open access model make articles freely available when authors pay them to do so or allow for author self-archiving of their articles in some manner (also for a fee) (Te, Owens, Lohnash, Christen-Whitney & Rebmann, 2017). The open access library and information science literature provides an excellent vehicle for teaching students practices relating to searching a dynamic and emergent field of publications and illustrates the rapidly changing publishing industry. Topics that students search for included access and inclusion, diversity, learning, information literacy etc. (depending on the course they were enrolled in). Instruction relating to the process of searching for open access journals in library and information science, in addition to searching for relevant articles in these journals, was provided to students. Students were asked to limit their searching to journals publishing under the open access gold model where fees are neither charged to authors nor to readers accessing journal content.

After the searching activity groups were asked to blog about the articles they found. Mandal (2011) defines the word blog as “an online diary where one can post information (not only text but also audio, photographs, and videos) on a regular basis”. While the literature surrounding blogging activities in the field of library and information science is vast (e.g. Bender, 2014; Greenland, 2013; Coulter & Draper, 2006; Wilson & Yowell, 2008), the subfield relating to educational blogging is relatively small and emergent (e.g. Aharony, 2010; Bishop, Tillman, Geiger, Haynes, Klaper, Murphy, Orr, Pedersen, DeStefano & Hamers, 2014; Cobus, 2009; Crane, 2007; Alqudsi-Ghabra & Al-Bahrani, 2012). Even smaller, though particularly relevant here, is the literature surrounding efforts to design collaborative educational blogging activities for students. Moving beyond research discussing the role individually-authored blogs can play in facilitating collaboration among online groups (Stephens & Roberts, 2017), collaborative blogging activities have been designed by Xie, Ke and Sharma’s (2010) research exploring peer interaction during team blogging activities. Xie et al. identified higher order thinking processes and reported that peer blogs and related comments provided “diverse perspectives and information so that they could gain a holistic view of the content” (p.461). In 2017, Kuo, Belland and Kuo designed a collaborative blogging activity for nontraditional, African American students taking instructional design courses. Via survey, the authors established relationships between blogging self-efficacy, sense of community, perceived collaborative learning, and perceived learning.

Challenges associated with individually-authored blogs (that students often have no desire to continue blogging beyond their programme of study or possible lack of interaction between

students as they individually engage with the scholarly literature) were anticipated. To address these challenges early on, and following the model put forth by Xie et al. (2010), students were placed in the role of team contributors to an ongoing scholarly blog designed to highlight open access research in the field of library and information science. Collaborative blogging groups jointly authored 750 to 1000 word responses to the articles they chose. These responses represented a scholarly take or an essential review of the article. The intervention also provided structure to students in terms of suggesting possible topics and content they might include. For example, among the suggestions were ideas to include an article synopsis, core research questions, methods used to answer research questions, any findings or conclusions, an offering of unanswered questions or issues future research might address, as well as an attempt to answer any questions posed. A commenting phase was included so that groups could comment on each other's posts with questions or constructive feedback. An article from a 2010 issue of *The Chronicle of Higher Education* was provided to highlight characteristics of quality in student blogging (Sample, 2010). Students posted their article reviews to a WordPress installation for the domain <http://www.openaccessreader.com>.

### 3. Discussion

Through involvement with the project's activities, students built relationships by working together on searching the open access (OA) literature of the field and synthesising it in a review format. These practices challenged students to engage in professionally-relevant practices of scholarly communication (blogging). Blog postings existed beyond the timeline of the course by placing student teams in the role of content contributors rather than sole authors. Finally, students used the blog postings as contributions to their e-portfolios (the programme's culminating experience), demonstrating the relevance of the activity to their programme of study and career preparation. Importantly, the hybridised project described here demonstrates the potential value in creating (open information literacy) learning designs that extend (and combine) the design experiment and information learning frameworks.

#### 3.1 How might learning design research practices impact informed learning? How iterative design and longer timescales impacted findings.

The iterative process of intervention-driven change, inherent to the design experiment model, supported the creation of a hybridised, informed learning design experiment. Along these lines, information practices such as searching the LIS open access literature, synthesising research, and scholarly communication via blogging were fused with subject content in a course-level intervention. The intervention was observed over several iterations (four iterations/semesters of six courses over two years). Learner and instructor experiences were reflected upon and used to inform modifications to the design of each iteration. For example, in the first iteration, instruction was provided to students regarding search practices but, ultimately, student groups were guided in their article selection. In the second (and subsequent) iterations, student groups searched for and selected their own journals and articles with no assistance from the instructor.

The original site included a plugin that generates a form hosted on the WordPress installation that allows users to submit posts for approval by an administrator. By the second and third iterations, it was possible to provide instruction related to the tagging of posts and to include two social media plugins. Additional instructional content was added to the intervention to show students how (and encourage them to) share their postings on LinkedIn, Facebook, and via other social media pingbacks. During this iteration, evidence emerged of students using pingbacks as a means of using their blog postings as contributions to their e-portfolios (the culminating experience for the department's Master of Library and Information Science degree).

The longer timescales that were built into the project structures allowed for the design of a flexible, adaptable, and responsive intervention. After several iterations, the learning design incorporated many more activities supportive of searching and scholarly blog-based

communication than were possible during the first attempt. Initially, the fusing of information practices with subject content was chaotic and limited. So much more was achievable over a longer time horizon. The intervention continues to change and live as an activity supportive of so much more in cycles 5 and 6 than in the first iteration. As a hybridised design experiment, the experiment continues.

### **3.2 How can hybridised, design experiments (as learning designs), support open information literacy? Why fusing information practices and curricular content matters.**

The iterative process of intervention-driven change, inherent to the design experiment model, motivated us to create a hybridised, informed learning design experiment where open information practices (searching the open access LIS literature) and subject content (diversity in LIS programming/services and learning design for new literacies) were fused and observed over several iterations. I refer to competencies associate with searching open access information and open educational resources as one dimension of information literacy or “open information literacy.” Importantly, learner and instructor experiences were reflected upon and used to inform modifications to the design of the next iteration.

Raising student awareness of the open access literature of the library and information science field (and the particular journals publishing in the subfield intersecting with the course) was an essential dimension of the open access collaborative blogging project for students. The (two) courses with the blogging activity covered the landscapes of learning about programmes and services to support diverse populations and learning design supportive of new literacies (respectively). Recent research has noted that open access journals enjoy heavier citation rates than those published by more traditional routes (Atchison & Bull, 2015; Hajjem, Harnad & Gingras, 2006; Harnad & Brody, 2004; Kurtz, Eichhorn, Accomazzi, Grant, Demleitner & Murray, 2005). Student engagement with open access LIS research can support their future programmes of research by helping them to understand the scholarly, research-based treatment of the concepts they encounter first in their courses. Later, when they are ready to publish themselves, they will know how to reach audiences widely and globally by strategic use of open access. As students develop competencies relating to navigating the open-access literature in ways contextualised to their programmes of study, they are gaining competencies in research practices they will need to support their future patrons and users in public, academic, and special libraries. As an issue of access and inclusion, knowing how to connect users with research in the open access domain will serve them (and their communities) well.

The project design also introduced a collaborative blogging activity. The blog operated as a collaborative activity on two levels. First, the blog represents a collaboratively-authored artifact drawing readers' attention to emerging, easily accessible research in the field of library and information science. Second, the blogging course assignments were written to prompt students to search for, analyse, and write about open access research in their field of study as a collaborative task. Importantly, this fused the subject content of the courses and information practices related to searching and scholarly communication. As a hybrid, informed learning, design experiment, the project:

- Created an active learning event where students collaboratively worked on a curriculum-intensive, complex, information task.
- Exposed students to practices of open information literacy via engagement with the open access research in library & information science.
- Provided students with a context to develop competencies in identifying and searching for open access journals and articles.
- Created a learning environment where students wrote critically about the scholarly literature.



- Implemented a course activity that had ongoing relevance for inclusion in student e-portfolios or work collections.

## 4. Conclusion

This project report represents an early step in thinking about the possibilities of infusing informed learning research structures and strategies with design experiments. Design experiment research and informed learning design share many sensibilities such as recognising the importance of the contingencies of context, distinct ecologies of learning, and the role of experience in the structuring of learning events. I remain excited about the fusing of information practices and LIS curricular content (specifically open information literacy) and see now there is great potential in continued exploration of informed learning via the timescales and iterative processes of design experimentation. It is my hope to continue this journey.

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