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Information Literacy in the Active Learning Classroom

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asked to describe what they considered important for their students to learn about using information and how they taught students to use information. The analysis revealed that teachers' ways of having their students engage with information in active learning environments may be associated with three themes: 1) *Information skills students should know*, 2) *Part of the process (of learning)*, and 3) *Empowered by disciplinary information practices*. Drawing insights from the findings, we conclude with recommendations about how librarians can identify how teachers perceive the relationship between information, subject content, and disciplinary approaches or tools.

INTRODUCTION

Indicated by inclusion in a number of accrediting standards of various disciplinary associations in Australia, Canada, the United Kingdom, and the United States (Bradley, 2013), information literacy has moved beyond the sole interest of the academic library community in higher education. Placing information literacy education in the disciplinary classroom would address calls to teach students to use information within the context of learning about a subject, an approach considered more likely to prepare learners for future endeavors (Bruce, 2008). We suggest that there are important advantages to be leveraged by librarians and classroom teachers working together to develop information literacy education. In moving away from traditional lecture-based instruction methods, teachers are adopting active learning approaches that require students to engage with information in ways that are new to them. Conversations about active learning provide opportunities for librarians to engage in meaningful dialogue about student learning with teachers. However, playing a consultative role with teachers may prove challenging for many academic librarians. It requires understanding the disciplinary information literacy perspectives teachers bring to the discussion. To address this concern, our study investigates how higher education teachers have their students use information in active learning courses.

Using thematic analysis, a method for identifying themes and patterns (Boyatzis, 1998), we examined transcripts from interviews with eleven teachers from ten different fields. Each of the teachers had previously participated in a development program focused on making their courses more student-centered, which includes the adoption of active learning activities. Among a number of educational practices, the teachers were introduced to information literacy during the semester-long development program. In the interviews, the teachers were

INFORMATION LITERACY AND ACTIVE LEARNING

Adopting active learning approaches in higher education has been shown to be beneficial to student learning and engagement in various disciplines (Michael, 2006; Prince, 2004). Associated with the educational theory of constructivism, active learning may support using current knowledge to construct new knowledge in a self-aware, metacognitive way (Anthony, 1996). The new *Framework for Information Literacy for Higher Education* (ACRL, 2015) emphasizes the relationship between using information and the creation of new knowledge (p. 3). There is a substantial body of research focused on applying active learning techniques in the teaching of information literacy (e.g., Jacobson & Xu, 2004). While many active learning approaches involve students using information in ways that align with the concepts described in the *Framework*, there is little scholarship that discusses how information is used within active learning techniques.

Active learning pedagogies such as problem-based learning, which involve students working in teams to gather and use information to inform solutions to complex problems, have been shown to enhance learners' abilities to use information (Dodd, 2007). Highly effective educational practices, such as undergraduate research or service learning, tend to be active in nature and typically involve using information in specific ways (Riehle & Weiner, 2013). In fact, learning to use information in specific ways is often identified as a goal in projects using these approaches. For example, an aeronautical engineering class might ask students to research the geopolitical aspects of fuel for an engine design project or team-based learning exercise. This may take previously known information, such as how much crude oil is required to create jet fuel, and tasks students to engage with that information in new ways in order to achieve a learning outcome.

Students independently engaging with sources may be seen as representing an alternative to the traditional dissemination model of teaching in which course materials are vetted by the professor (Breivik, 1998). As such, using information may in itself be considered

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a type of active learning. However, not all students use information within a learning environment in the same way (e.g., Limberg, 1999; Lupton, 2008; Maybee, 2006). When completing assignments, whether considered active or not, some students focus primarily on procedural aspects of using information. They make a distinction between searching, analyzing, and so forth, and what they perceive to be "learning" about a subject. This growing body of research into the student experience of information literacy has shown that students use information with more complexity and versatility when they associate it with learning about course content.

While not focused specifically on active learning, there has been scholarship to determine how teachers in higher education understand information literacy. Some studies have framed information literacy using the ACRL standards (2000) or some other pre-existing model (Gullikson, 2006; Leckie & Fullerton, 1999). These studies do not uncover how teachers have their students engage with information, so much as indicating the acceptance of information skills highlighted in the *Standards*. However, a few studies have used inductive methodologies designed to reveal how educators in higher education understand information literacy from their own perspectives. These studies reveal a range of teachers' experiences with information literacy (Bruce, 1997; Webber, Boon, & Johnston, 2005), which may also be shown as focused on either procedural aspects of using information or on learning about a subject.

A study of teachers of marketing and English showed that these teachers may focus on developing information skills, such as using technology, or accessing information online or in print (Webber et al., 2005). However, marketing and English teachers may also focus on having their students engage with information to learn about the subject of their courses by adopting a critical stance, or in the case of the marketing teachers, use information to accomplish goals beyond the classroom or as part of developing a professional identity. With the aim of students being able to use information with more complexity and versatility, Bruce (2008) suggests that teaching should provide students with learning experiences that allow them to engage with information as they learn course content.

Teachers' requirements for how their students use information has been shown to influence what students are able to learn about a topic (Maybee et al., in press). The teacher of an undergraduate writing course enabled her students to see a language and gender issue as something that evolved through research studies rather than seeking to support their existing perspective on the topic. To accomplish this, the teacher had the students write a paper in which the thesis needed to reflect the evolution of the topic as well as where it may be headed based on that trajectory. Accounting for how information is used in a learning environment is important for designing meaningful learning experiences.

Active learning provides opportunities for librarians to partner with higher education teachers to integrate information literacy into coursework (Fosmire & Macklin, 2002; Spence, 2004). Development programs that focus on enhancing higher education courses often support teachers incorporating active learning into courses (e.g., NCAT, 2005). Participation in these types of programs may provide entrée to librarians to develop relationships with classroom teachers. In order for librarians to work with classroom teachers to create active learning environments that integrate information literacy, they must develop shared goals (Flierl, Maybee, Riehle, & Johnson, forthcoming). Partnering in this way requires an understanding of how higher education teachers have their students engage with information within the active learning environments they have designed.

METHODS

The research question guiding our study asks, "How do higher education teachers have their students use information in active learning courses?" Recognizing the opportunity that the adoption of active learning holds for information literacy (Fosmire & Macklin, 2002; Spence, 2004), our investigation aims to support librarian-faculty collaborations by providing librarians with an understanding of how higher education teachers have their students use information in active learning classroom environments.

PARTICIPANTS

We used a purposive sampling method in which the teachers at a large research institution were invited to participate specifically because of their ability to provide data that would inform the research question (Patton, 2002). All of the teachers had participated in a faculty development program called IMPACT (Instruction Matters: Purdue Academic Course Transformation). The program focused on bringing active learning into foundational courses. Meeting weekly across a 14-week semester, the teachers worked with a team comprised of an instructional developer, an instructional technologist, and a librarian. In the weekly meetings, the teachers were introduced to a variety of educational frameworks and tools intended to help them make their courses more active and motivating for students. They were also introduced to information literacy. Although the decisions regarding changes made to the course ultimately resided with the teacher, librarians on the team regularly made faculty aware of how students may need to use information to successfully complete learning activities and assignments. As outlined in Table 1, participants were either continuing lecturers, meaning that their primary job duties were teaching, or professors, who conducted research in addition to teaching. The participants represented a number of disciplinary areas.

DATA COLLECTION

Semi-structured interviews are often used in qualitative research to gather data (Kvale & Brinkmann, 2009). Semi-structured, audio-recorded interviews lasting approximately 60 min were conducted with each participant. Most of the interviews were held in the neutral environments of library meeting rooms, but by request, some interviews were conducted in teachers' offices. Aligned with the inductive nature of the study, the interview prompts were open-ended. The interviewers (two of the authors) practiced "bracketing" during the interviews, an interview technique in which the interviewers engage in empathic listening and silence one's own concerns and judgments (p. 27). Six questions were used in the interviews, although the data related to two questions about the use of classroom spaces were not included in this analysis. There were four interview prompts guiding this part of the study:

1) Tell me about your course redesign.
2) What do you think are the most important things your students need to learn about using information to do well in your IMPACT course?

Table 1
Participant characteristics.

	Teachers interviewed N = 11
Sex	7 - Female 4 - Male
Field	1 - Biology 1 - Computer science 1 - Education 2 - Engineering 1 - General studies 1 - Management 2 - Nursing 1 - Statistics 1 - Technology
Role	4 - Continuing lecturer 7 - Professor

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