



Information literacy supporting student motivation and performance: Course-level analyses



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ABSTRACT

Examining data from over 3000 students in 102 course sections across seven colleges of a large, public, research intensive university in the United States, this study investigates the relationships between information literacy (IL) and course-level academic performance and student perceptions of their learning environments. The results provide evidence of the following: 1) students who synthesize information and communicate the results tend to perceive higher levels of motivation than students who do so less often; 2) there is a significant positive relationship between synthesizing information and communicating the results and course level learning gains. The results point to the efficacy of IL being integrated into learning disciplinary course content, as well as the benefit of prioritizing high-order IL activities, such as synthesizing information, over other the aspects of IL, such as searching or formatting citations.

1. Introduction

Information literacy (IL) has been recognized as an important outcome of undergraduate education ([Association of American Colleges and Universities \[AACU\], 2009](#)). However, this does not obviate the need to prove the value of IL to campus leaders. IL is often construed as discrete skills that students need to find and evaluate information. These skills are recognized as necessary for students to navigate the deluge of information they encounter. However, IL may also be associated with disciplinary learning ([Bruce, 2008](#)), or other elements that may influence learning in the classroom, such as student motivation ([Maybee & Flierl, 2017](#)). The specific way students engage with information as they learn may influence disciplinary learning outcomes ([Limberg, 1999](#); [Maybee, Bruce, Lupton, & Rebmann, 2017](#)). Yet, the majority of studies in this area focus on how students learn IL skills, rather than how IL fosters disciplinary learning gains. Developing a greater understanding of the relationship between IL and student performance (for example, on exams or projects) and between IL and student motivation may better equip educators to develop effective IL practices.

2. Problem statement

Given the importance of assessing what best facilitates student learning, as well as the need to demonstrate the value of IL, it is

essential to understand how IL supports student achievement. Previous research studies examining IL in relation to student performance or student motivation have tended to conceptualize IL as a set of general information skills. Therefore, these studies define student performance as the measurable learning of information skills, and explore the role of motivation in allowing students to gain these skills. There is a need for research that examines the relationship of IL to overall student performance, an indicator of disciplinary learning, and other concepts related to performance, such as student motivation. Yet, little research has examined the relationship between IL, student motivation, and performance in a large-scale investigation, spanning multiple disciplines of undergraduate curricula. To illuminate the role of IL in the higher education classroom, this research explores the following question: What are the measurable relationships between the frequency and type of information engagements with which instructors task students, and student motivation and course grades?

3. Literature review

3.1. IL and student performance

Studies examining the relationship between IL and student performance have tended to frame information literacy using the Information Literacy Competency Standards for Higher Education, now rescinded by the [Association of College and Research Libraries \(ACRL, 2000\)](#). Such

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studies focus on measuring student achievement related to mastering information skills (Shao & Purpur, 2016), reporting student perceptions of them (Kim & Shumaker, 2015), or both (Squibb & Mikkelsen, 2016). Some researchers have explored IL in relation to other variables, as well. For example, Detlor, Booker, Serenko, and Julien (2012) compared the effects of lecturing versus active learning strategies for IL instruction, finding active learning techniques, where students analyzed, synthesized, and evaluated information, better supported students' achievement of class learning outcomes.

Research examining the relationship between IL and student achievement also varies by the scale of the assessment. Studies range from small-scale investigations of assignment-level performance gains (Kim & Shumaker, 2015; McMillan & Raines, 2011) to analyzing data from over 5000 students, examining which specific library services and resources relate to increased freshmen GPA (Soria, Fransen, & Nackerud, 2014). While small-scale studies offer details as to how students use information for specific assignments, and large-scale studies illustrate high-level patterns regarding library resources, services and student success metrics, studies targeting course-level grades can provide critical clues about how IL relates to student performance within disciplinary contexts. Some studies examine this relationship between IL and course-level grades (Coulter, Clarke, & Scamman, 2007; Ferrer-Vinent, Bruehl, Pan, & Jones, 2015; Shao & Purpur, 2016), yet many portray IL as resource-oriented or generic skills that are not grounded in the disciplinary context being examined.

3.2. IL and motivation

Motivation is important for student learning, and researchers have explored motivational elements and strategies that affect students learning IL concepts and skills (Chang & Chen, 2015; Jacobson & Xu, 2002; Shenton & Fitzgibbons, 2010; Small, Zakaria, & El-Figuigui, 2004). Some studies examine motivation as a general concept (Matteson, 2014), while other research focuses on related elements, such as relevance (Banas, 2009), authenticity of course content (Klipfel, 2014), or students' (perceptions of) self-efficacy (Folk, 2016; Kiliç-Çakmak, 2010; Ross, Perkins, & Bodey, 2016). These studies focus exclusively on motivating students to learn IL, rather than how IL and motivation relate to learning subject content. However, IL can be associated with student motivation and disciplinary learning (Maybee & Flierl, 2017). For example, Maybee and Flierl describe an assignment in an introductory statistics course that was designed to motivate students to learn statistical concepts by having them use those concepts to evaluate information found in the news related to a topic of their own interest. Additionally, although many of these studies examine motivation broadly, very little scholarship has drawn from specific motivational models to explore the relationship between IL and motivation in higher education.

3.3. Self-determination theory

Self-determination theory (SDT) is a theory of motivation applied to diverse fields including health care, parenting, and education (Deci & Ryan, 2002). SDT suggests that more autonomy-supportive learning environments are cultivated by satisfaction of three basic psychological needs: autonomy, relatedness, and competence. When students perceive that they can make meaningful choices within a structure (autonomy), feel connected to fellow students, the instructor, and the subject content (relatedness), and believe they are able to accomplish what is asked of them (competence), they tend to feel more intrinsically motivated to learn and are more engaged in their courses. Creating a learning environment conducive to positive student perceptions of these psychological needs has been associated in SDT research with many positive outcomes, including psychological wellness, increased effort and persistence, and various academic achievement factors (Niemiec & Ryan, 2009; Ryan & Deci, 2017).

4. Methods

4.1. Data collection

Data were collected at a large, public, research intensive university in the United States across two semesters (Fall 2015 and Spring 2016) from students, instructors, and university records. Student data were collected through an end-of-semester student perceptions survey (Appendix A) sent to all students enrolled in a course section that had completed IMPACT, a large-scale course re-design program.¹ Instructors provided data on how students used information in their sections through an online survey administered by trained staff. Finally, university records were accessed to provide student demographics and grade data.

4.2. Sample

The sample included 102 course sections from 44 different courses taught at a large public institution in the Midwest. Course sections were included in the sample if at least 15 students and at least 25% of the students enrolled in the course responded to the student perceptions survey (threshold based on Gillmore, Kane, & Naccarato, 1978). The course sections varied in level, class size and college (Table 1). A total of 6874 students over the age of 18 were enrolled in the course sections; of those students, 3152 students (46%) completed a student perceptions survey at the end of the semester which included measures of learning climate, basic psychological needs, self-determined motivation, and perceived knowledge transfer scales. Table 2 shows the demographics information of the enrolled students.

4.3. Measures

4.3.1. Information literacy questions

The questions related to information literacy were included on the survey for instructors who redesigned their courses. The questions were created based on a rubric listing the key skills for courses to meet the university's core curriculum IL outcome (Purdue University and Senate Educational Policy Committee, 2012). The criteria for the rubric was adapted from the AACU (2009) VALUE rubric for information literacy, which was developed through a process that involved input from faculty at institutions across the United States. With the core curriculum approved by the Purdue Senate in 2012, the criteria presented in the rubric provides a shared definition of IL agreed upon by the university's faculty:

- determine the extent of information needed (define research questions, and determine key concepts),
- access the needed information (develop search strategies),
- evaluate information and its sources critically (identify and analyze assumptions and contextual elements),
- use information effectively to accomplish a specific purpose (communicate, organize and synthesize information from sources), and
- access and use information ethically and legally (use references and in-text citations, and understand ethical and legal restrictions on the use of information). (Purdue University and Senate Educational Policy Committee, 2012)

The five information literacy questions (Table 3) asked instructors to identify the frequency with which they expected students to experience the following on a scale from 1 (never) to 5 (very often: > 16 times a semester):

- IL1: Pose questions or problems that require further investigation.

¹ <http://www.purdue.edu/impact>.

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