Imposed-inquiry Information-seeking Self-efficacy and Performance of College Students: A Review of the Literature

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ABSTRACT

Information literacy is a constellation of skills related to information use, one of which is information seeking. Proficiency in information seeking alone is not sufficient, though, because having the procedural knowledge necessary to complete a task is irrelevant without the confidence to act on that knowledge. Despite its importance, researchers have only begun investigating information-seeking self-efficacy in the last few decades, and multiple studies have demonstrated the importance of information literacy instruction in developing self-efficacy. How and why self-efficacy changes are key questions in this line of research, and both require a reliable and valid method of measuring self-efficacy, as well as an objective, quantitative measure of performance. Multiple researchers have addressed this issue in their research, often in relationship with another topic, including the efficacy of different pedagogical approaches, the relationship between self-efficacy and performance, human-computer interaction with search systems, and the interrelationships between self-efficacy and multiple other variables. Although progress has been made, a great deal of research is required to properly understand the relationship between self-efficacy and performance, and the complex interrelationships with other factors, which would allow for the development of better information literacy instruction.

Introduction

Information literacy has been described as a constellation of skills related to information use, including knowing when information is needed, being able to identify and articulate what information is needed, knowing where and how to locate the needed information, and being able to interpret and use information effectively and ethically (Association of College and Research Libraries [ACRL], 2000). Information seeking is one part of information literacy and aligns with the ACRL's (2000) first two standards for information literacy competency in higher education: "the information literate student determines the nature and extent of the information needed," and "the information literate student accesses needed information effectively and efficiently." The ACRL standards have guided information literacy instruction at colleges and universities across the United States for nearly two decades, and still do to a certain extent; however, the recently adopted *Framework for Information Literacy for Higher Education* (ACRL, 2016) is redefining information literacy and how Librarians approach its instruction. In this theory-based framework, information seeking is still a core part of information literacy and aligns with several knowledge practices and dispositions of two of the six frames: "research as inquiry" and "searching as strategic exploration" (ACRL, 2016).

Although a great deal of research has been conducted exploring the relationships between information literacy and academic performance and between academic self-efficacy and academic performance, researchers have devoted considerably less attention to the nature and acquisition of self-efficacy in information seeking specifically (or information literacy generally) and its relationship with performance in information-seeking tasks. Self-efficacy is an estimation of one's ability to bring about a specific outcome, and level of self-efficacy is closely related to one's emotional response to challenges and the amount of time and effort one will expend trying to overcome them (Bandura, 1977). Those with low self-efficacy lack confidence in their capability, typically respond to new tasks with anxiety, may attempt to avoid challenges altogether, and thus fulfill their self-made prophecy of failure (Bandura, 1977). The goal of instruction is to increase students' success, which requires more than just the acquisition of skills and knowledge: it is a function of belief in their competence (i.e. self-efficacy), as well as their competence (Bandura, 1986). A better understanding of the relationship between self-efficacy and performance in information seeking will allow Librarians to develop instruction practices that build self-efficacy, making instruction sessions more effective. This review will summarize the literature currently available on this topic, comment on research trends that have emerged, and identify gaps in the available research.

Imposed-inquiry information seeking

All information seeking can be divided into two categories based on the origin of the information need: imposed inquiry is compelled or assigned by external forces, while self-generated inquiry develops from an individuals' desire to know something (Gross, 1999). Imposed inquiry, sometimes called directed inquiry, is very common in formal education, and virtually every assignment falls under this category, with more or less control exercised by the instructor. An assignment related to finding information is by definition an imposed inquiry. Gross (1999) surveyed approximately 1200 students, parents, and teachers at three schools about the types of information seeking they engaged in, and although there were differences between the schools, an overall pattern became apparent: information seeking in early childhood is overwhelmingly self-generated and over time the percentage shifts to imposed inquiry, with adults' information seeking overwhelmingly being imposed rather than self-generated.

Because the origins of imposed and self-generated inquiry are different, they are studied in very different ways. Study of self-generated inquiry tends to focus on the impetus for the desire to know, including the cognitive processes behind the spark of interest that initiates information seeking and the reasons for different levels of motivation for self-generated information seeking. This research is rarely applied in an educational setting. Imposed inquiry, however, tends to be studied as a process per se, knowledge about which is applied to improving student efficiency and efficacy in searching. This improvement in information literacy is crucial for academic growth of students in higher education and the development of lifelong-learners and informed citizens (ACRL, 2000).

Self-efficacy and information skills

Self-efficacy is one of the core constructs of Bandura's social cognitive theory and refers to confidence in one's ability to effect the result one intends (Bandura, 1986). Information literacy skills alone are not enough to ensure students' success in information-seeking behavior, because having the procedural knowledge necessary to complete a task is irrelevant without the confidence to act on that knowledge. High self-efficacy and positive efficacy expectations reduce anxiety, which is especially prevalent in the initial stages of searching (Kuhlthau, 1991), and increases the effort students are likely to expend (Bandura, 1977). Early attention to self-efficacy in literature on information seeking was not phrased as such, but instead it was termed "library anxiety" and described as feelings of inadequacy that are viewed by students as shameful and requiring concealment (Mellon, 1986).

Once Bandura's social cognitive theory became more widely known by information and library science researchers, studies comparing the level of information literacy self-efficacy at different points during college years were conducted with unexpected results. Kurbanoglu (2003) surveyed 179 Turkish undergraduate students in the Department of Information Management at Hacettepe University and found that information-seeking self-efficacy was lowest during the first year of college, increased significantly in the second year, and then remained relatively unchanged. Likewise, in their investigation of the relationships between information literacy self-efficacy, learning style, personality type, and information behavior micro-processes among 194 British nursing students, Stokes and Urquhart (2011) found that information literacy self-efficacy appeared to grow significantly between the first and second levels of the program before decreasing during the research-intensive third level. The expected results for both studies were that students' self-efficacy for information seeking would steadily increase with time and experience. The similarity of their results is striking, especially with their relatively large sample sizes and significant demographic differences in their samples. This would seem to indicate that this is a widespread phenomenon, not an isolated case, and imply that we as Librarians are failing upper-level undergraduate

students in at least some aspects of information literacy instruction. A potentially interesting avenue of future research results from this assessment: do instructional practices intended to improve information seeking self-efficacy affect the rate of change of undergraduates' self-efficacy acquisition?

Measuring self-efficacy

Understanding how and why self-efficacy changes has become one of the most important points of research in this vein, necessitating a reliable and valid method of measurement. Although several instruments intended to measure information literacy self-efficacy have been validated and published (Behm, 2015; Kurbanoglu, Akkoyunlu, & Umay, 2006; Pinto, 2010), many researchers have designed their own, often adapted from self-efficacy scales in related domains, and a great deal of variety exists in these instruments' format and rigor. These range from a single question intended to measure changes in self-efficacy after each of 20 information-seeking cycles (David, Song, Hayes, & Fredin, 2007) to an 89-item scale designed to measure information literacy self-efficacy that was developed and published by Akkoyunlu and Kurbanoğlu (2003) in Turkish. Scales that have been used in the literature are fairly evenly distributed into three groups between these two extremes: those with under 10 items (Booker, Detlor, & Serenko, 2012; Nahl & Meer, 1997; Tang & Tseng, 2013; Theng & Sin, 2012; Tsai & Tsai, 2003; Zha, Wang, Yan, Zhang, & Zha, 2015), those with 10 to 20 items (Kurbanoglu et al., 2006; Ren, 2000; Rosman, Mayer, & Krampen, 2015; Tella, 2009; Wood, Kakebeeke, Debowski, & Frese, 2000), and those with over 20 items (Bronstein, 2014; Debowski, Wood, & Bandura, 2001; Kurbanoglu et al., 2006; Pinto, 2010). Information-seeking and information literacy self-efficacy scales have been based on general self-efficacy scales (Tella, 2009), as well as a variety of related domain specific scales, including information use in digital commerce (Zha et al., 2015), internet use (Bronstein, 2014; Tsai & Tsai, 2003), and computer use (Goh, 2011). Most, but not all, of these scales are tested for internal consistency using Cronbach's alpha, and a few are tested for discriminant or convergent validity, but rarely for both.

The earliest attempt at creating a validated, standardized instrument for information literacy self-efficacy was a 14-item scale developed and submitted for publication by Debowski, Wood, and Bandura in 1998. Though it was never published as such, it was employed by Wood et al. (2000) and was later developed into a 27-item scale used by Debowski et al. (2001). Wood et al. (2000) cite the alpha value ($\alpha = 0.95$) from the validation study and indicate that factor analysis yielded a single factor for each measure, though it is unclear whether this is based on the validation study or data gathered in the present study. Given the small sample size ($N = 17$) of Wood et al. (2000) and the unknown sample size of the validation study, it is unclear which would be more reliable. The process that this scale underwent to become the 27-item scale used by Debowski et al. (2001) is unclear, although a similar alpha is cited ($\alpha > 0.95$). The sample size of this study ($N = 48$) is better than Wood et al. (2000), but not nearly large enough to ensure generalizability of results to the population. More information is needed to judge the validity and reliability of these scales, and it is likely that the questions have become outdated.

Several years later Akkoyunlu and Kurbanoğlu (2003) developed and published an 89-item, Turkish-language instrument for information literacy self-efficacy (Kurbanoglu, 2003), which was revised into two instruments, a long form composed of 28 items and a short form composed of 17 items (Kurbanoglu et al., 2006). Both forms are divided into three skill levels: basic, intermediate, and advanced. The 28-item version of Kurbanoglu et al.'s (2006) information literacy self-efficacy scale is more commonly used by researchers in their studies (Kiliç-Çakmak, 2010; Ross, Perkins, & Bodey, 2013; Ross, Perkins, & Bodey, 2016), in part because Kurbanoglu et al. (2006) found its internal consistency ($\alpha = 0.92$) to be higher than the 17-item version