Collaborative Learning in an Information Literacy Course: The Impact of Online Versus Face-to-face Instruction on Social Metacognitive Awareness

Marcia E. Rapchak

Gumberg Library, Duquesne University, 600 Forbes Ave, Pittsburgh, PA 15201, United States

ABSTRACT

Metacognition and social metacognition play important roles in information literacy, online learning, and collaborative learning. This study examines how students rated themselves in both metacognitive and social metacognitive awareness after a collaborative project in an information literacy course offered face-to-face and online. Students in the face-to-face version of the course rated themselves as having higher social metacognitive awareness, though metacognitive awareness scores were similar. Because of this finding, this article makes recommendations for improving collaboration online for information literacy instruction.

Introduction

As the Framework for Information Literacy begins its third year of existence and libraries and librarians integrate it into their information literacy instruction, how librarians encourage students to engage their information environments necessarily changes. The relationship of information literacy to metacognition, generally defined as thinking about one's own thinking (Flavell, 1979), has been one aspect that librarians are considering more as they reformulate their instruction. As the ACRL (2015) Framework states, metacognition is essential "to becoming more self-directed in that rapidly changing ecosystem." Metacognition is a key element of metaliteracy, another concept that influenced the creation of the Framework (ACRL, 2015). Metaliteracy is the ability to collaborate, share, reuse, and remix effectively in participatory environments (Mackey & Jacobson, 2014). In these collaborative environments, as students, peers, and colleagues work together to integrate and co-create knowledge, social metacognitive skills enable groups to co-regulate their learning to take full advantage of the cognitive strengths of group members. Social metacognition, the ability of the group to regulate and plan their learning experience, has not appeared as an important concept in the information literacy literature as of yet, but it is an essential underpinning of the success of working together toward a goal in a collaborative information environment.

Much of this collaboration occurs online, and with the rise in online learning in higher education, more and more students may never meet each other face to face. With new methods of teaching online, librarians have become embedded in course learning management systems to provide support to students as they complete research-based projects. Additionally, for those universities with information-literacy focused courses, some have adapted the course for offering both face-to-face and online learners, like the course offered at the author's institution, while others have moved the course to the online environment entirely (LeMire, 2016; Mulherrin, Kelley, Fishman, & Orr, 2004), and some have created a new course available online only (Burgoyne & Chuppa-Cornell, 2015). In creating these online courses, librarians must ensure that they provide the same level of quality as face-to-face instruction. As libraries work with the framework, that online instruction must reflect the realities of the information environment, metaliteracy, and the importance of the co-creation of knowledge.

This article examines the metacognitive and social metacognitive awareness of students completing a collaborative project in a first-year information literacy course, and compares those awareness scores of students taking the course online and those taking the course in person. The differences therein provide an indication of where students are successful and where librarians and/or instructors may need to implement different strategies to increase student success in information literacy instruction. Without an understanding of where and how we can best assist students in online instruction, librarians may not be able to effectively meet the needs of online students.

Literature review

To effectively research, students must recognize that information is required to answer a question, and they must also identify the skills they need to find that information; thus, those students who are information literate can deploy those skills necessary for a particular information need and anticipate their own ability to research (Mackey & Jacobson, 2014). All of these competencies indicate metacognitive

awareness that allows students to continue to improve their research abilities and better understand their information environment.

Metacognition refers to the ability to critically evaluate one's own thinking. This is positively associated with student success and learning (Broadbent & Poon, 2015; Slavin & Lake, 2009; Wang, Haertel, & Walberg, 1990). Metacognition, like information literacy, enables lifelong learning by providing strategies for thinking about and reflecting on learning in various disciplines. Many of the methods by which someone can become a stronger researcher, which librarians often teach students, scaffold metacognitive skills. Tools like citation matrices, word clouds, concept maps, and source evaluation models (CARS, CRAAP, etc.) all provide methods that encourage reflection on research strategies (Houtman, 2015). Metacognition is particularly important for online learners because completing online courses requires the ability to regulate one's own learning and to stay motivated to complete coursework (Conrad, 2009; Lee, Choi, & Kim, 2013; Rakes & Dunn, 2010; Sitzmann, 2012).

Metacognition can be measured in multiple ways that have varying validity and reliability. A popular method is through self-report instruments. There are a variety of metacognitive self-report instruments, including the Metacognitive Awareness Inventory (MAI) (Schraw & Dennison, 1994), the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich, Smith, García, & McKeachie, 1993), and the Metacognition Questionnaire (Scott & Levy, 2013). These ask students to reflect on their metacognitive strategies by answering a series of questions, often on a Likert scale. Another method of assessing metacognition is through coding think-aloud protocols, interviews, and transcript (Winne, 2010). Both methods have the disadvantage of requiring students to reflect on their metacognition, which they may not have the capacity to do, or make explicit their metacognitive activities, which are inherently internal processes, but linking these strategies to positive performance can verify their construct validity. For example, the MAI has been linked to college success in multiple studies (Hammann & Stevens, 1998; Lehmann, Hähnlein, & Ifenthaler, 2014; Sperling, Howard, Staley, & DuBois, 2004; Tok, Özgan, & DÖg, 2010; Young & Fry, 2012). Thus, metacognition has been shown to be an important component to student learning and information literacy.

Social metacognition refers to the ability to regulate group learning. As students work together in groups, they must describe their metacognitive processes to each other, which scaffolds these processes (Chiu & Kuo, 2009). Students monitor the thinking of the group, identify who has what knowledge in the group, and collaboratively set goals (Siegel, 2011). While research on social metacognition and learning outcomes is limited, social metacognition has been correlated with stronger group performance (Panadero, Kirschner, Järvelä, Malmberg, & Järvenoja, 2015). Assessment of social metacognition has mostly been restricted to coding of observed behavior (Iiskala, Vauras, Lehtinen, & Salonen, 2011; Khosa & Volet, 2014; Rogat & Linnenbrink-Garcia, 2011). This means that researchers must be able to see online discussions and observe face-to-face interactions. Social metacognition can also be assessed using self-report instruments, but these have focused mostly on student attitudes and emotions (Järvelä, Järvenoja, Malmberg, & Hadwin, 2013; Volet & Mansfield, 2006). This study uses a social metacognitive instrument adapted from a metacognitive instrument so that the new instrument measures social metacognition, which means it can be used both online and face-to-face and does not require researcher observation of all interactions.

Social metacognition and collaborative learning are supported by the educational theory of social constructivism, often attributed to Vygotsky (1978). This emphasizes the importance of the learner's interaction with others. In a social constructivist classroom, students cooperate to find answers to problems that they find relevant to their own lives (Wells, 2000). Through collaborative learning, teachers and peers model ways of navigating with the world for the student, and students learn more from these interactions than they would in independently exploring problems. Clearly, a focus on social metacognition and the scaffolding of metacognition generated by collaboratively learning is supported by a social constructivist approach to education.

As students become participants in the digital environment, more information literacy instructors move toward collaborative learning so that students can share resources and engage in a conversation that creates a shared understanding of information (Ravenscroft, 2011; Witek & Grettano, 2014). With tools that allow the collaborative organization and evaluation of information, like Padlet and Trello, students work together to improve their ability to regulate their own learning (Lamb & Johnson, 2009). Students navigate the research process through these "participatory technologies" (Farkas, 2012). In a recent survey of redesigned spaces in academic libraries, 40 of the respondents (82%) stated that the intended goal of the redesign was to create space for collaborative learning (Head, 2016). New library spaces reflect the social constructivist approach to educational spaces. Given this pedagogical focus, information literacy instructors can use strategies of increasing social metacognitive awareness to prepare students for collaborative environments in higher education and beyond.

As more learning moves online, libraries should endeavor to provide the kind of collaborative learning face-to-face and online that the technology and pedagogical theory support. Information literacy instruction online is not novel. Online instruction for information literacy can include tutorials, embedded librarianship, flipped classrooms, and for-credit courses. These often provide flexible, point-of-need instruction. Several universities have converted their for-credit information literacy courses from face-to-face to online (García, Stacy-Bates, Alger, & Marupova, 2017; Long, Burke, & Tumbleson, 2012; Ovadia, 2010), or have always offered their for-credit, information literacy courses online (Bishop & Mabry, 2016; Lemire, 2016). Like findings from other meta-analyses comparing face-to-face and online instruction (M Means, Toyama, Murphy, & Baki, 2013), information literacy online instruction tends to have the same or better learning outcomes assessment results than information literacy offered face-to-face (Weightman, Farnell, Morris, Strange, & Hallam, 2017). While not as much has been written about collaborative information literacy instruction online, Meredith Farkas (2012) called for Pedagogy 2.0 in information literacy instruction, which would provide students with "opportunities to work in groups to develop a collective understanding of information literacy and wrestle with specific information issues collaboratively"(p. 91). The course in this study asked students to address a research question and consider their research strategies as a group rather than as individuals.

Methodology

Research question

This study examines the research question "Do first-year students working collaboratively in an online and face-to-face information literacy course have similar social metacognitive awareness ratings?" By examining this question, the author hopes to discover whether students in an online course may need more intervention to be able to work effectively on a research project.

The course and assignment

The course is a required, one-credit information literacy course that all students take some version of in their freshman year. While online sections had been offered to transfer students, fall of 2016 was the first year that multiple online sections were opened for freshmen. The online version of the course was asynchronous, while the face-to-face version met once a week for fourteen weeks. Students were from a variety of disciplines, though students in education, nursing, pharmacy, allied health, and liberal arts had their own versions of the course, so this course mostly represented students from business, the sciences, and