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

**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 ends its second year of existence and libraries and librarians work to integrate it into their information literacy, their approach to instruction and how they encourage students to engage in their information environments necessarily changes. One aspect of information literacy that has received some attention is its relationship to metacognition. As the ACRL framework states, metacognition is essential “to becoming more self-directed in that rapidly changing ecosystem.”1 Metacognition is a key element of metaliteracy, another concept that influenced the creation of the framework.2 Metaliteracy focuses the ability to collaborate, share, reuse, and remix effectively in participatory environments.3 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 the course LMS 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,4 and some have created a new course available online only.5 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 identify a need for information, as well as identifying the skills needed to find that information; thus, those students who are information literate anticipate their ability to meet information needs by implementing the research strategies they have.6 All of these abilities 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.7 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 strategies to encourage consideration of how one is thinking throughout the research process.8 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.9

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),10 the Motivated Strategies for Learning Questionnaire (MSLQ),11 and the Metacognition Questionnaire.12 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.13 Both methods have the disadvantage of requiring students to reflect on or make explicit their metacognitive activities, 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.14 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 also scaffold metacognitive processes for each other.15 Students monitor the thinking processes of the group, identify who has knowledge in the group, and collaboratively set goals.16 While research on social metacognition and learning outcomes is limited, social metacognition has been correlated with stronger group performance.17 Assessment of social metacognition has mostly been restricted to coding of observed behavior.18 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.19 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.20 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.21 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 contribute content to the digital world, more information literacy instructors move toward collaborative learning so that students can share resources and engage in a dialogue that creates a shared understanding of information.22 With social annotating and tagging, social bookmarking, and collaborative concept mapping through tools like Padlet and Trello, students work together to improve their ability to regulate their own learning.23 Students navigate the research process through these “participatory technologies.”24 In a 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.25  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,26 or have always offered their for-credit, information literacy courses online.27 Like findings from other meta-analyses comparing face-to-face and online instruction,28 information literacy online instruction tends to have the same or better learning outcomes assessment results than information literacy offered face-to-face.29 While not as much has been written about collaborative information literacy instruction online, Meredith Farkas 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.”30 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 music.

Students worked on a semester-long, collaborative assignment in which they collected and evaluated sources to answer a research question. Both online and face-to-face sections had the same assignment. Students addressed questions like “Does social media cause narcissism?”and “What are the ethical issues raised be self-driving cars?” They described their search strategy, critiqued their search strategy, cited their sources, and evaluated each source (See Appendix A). In the online course, collaboration occurred in a group discussion board online. In the face-to-face course, students were given a chance to work together in class. In both versions, students had to determine deadlines, topics, what citation style they would use, and what sources they would include. Group sizes were not consistent across sections or format of course and were up to the instructor’s discretion, though they mostly ranged between three and five students. Students were asked to choose roles in their group work to better coordinate collaboration. For example, a group leader would set deadlines while an editor would review all the work. Students received both a group grade and an individual grade for their group project, and they also provided a rating of each group member

The students in both the face-to-face and online versions of the course were asked to complete the Metacognitive Awareness Inventory and the Social Metacognitive Awareness Inventory after they had finished the collaborative project in the course. Students had to consent to the study, and could stop their participation at any time. This study had IRB approval from the researcher’s institution.

***Instruments***

The Metacognitive Awareness Inventory (MAI) is a 5-point Likert Scale from Schraw and Dennison.31 It has a 52-item scale with a response of Always False corresponding with 1 and Always True corresponding to a score of 5. The scale asks questions regarding an individual’s knowledge of their cognition and regulation of their cognition. An example question related to one’s knowledge of cognition is “I understand my intellectual strengths and weaknesses.” An example question related to one’s regulation of cognition is “I ask myself periodically if I am meeting my goals.” The Social Metacognitive Awareness Inventory (SMAI) was based on this scale and adapted for the researcher’s dissertation. Questions were adapted to refer to group rather than individual processes (see Appendix B). So, for knowledge of social cognition, the question became “My group understood our intellectual strengths and weaknesses” and for regulation of social cognition, the question became “My group asked periodically if we were meeting out goals.” Questions that could not apply to group situations were removed. This left 41 questions, and used the same scale as the MAI. Reliability statistics indicated that, for this study, both SMAI and MAI were very reliable, with a Cronbach’s α of .972 for the SMAI and a Cronbach’s α of .961 for the MAI. Cronbach’s alpha indicates the degree to which the instruments consistently ask about the same construct. According to an Item Scale Analysis, removing a question would not help the reliability of the SMAI, so all questions were included in the data analysis.

**Results**

Three hundred and nine students completed all the questions on the MAI and the SMAI. Of the 309 students, 261 were in the face-to-face course, while 48 were online. The researcher had visited classrooms for participation, while online students were emailed the survey. Thus, face-to-face participation was much higher. Still, this provided enough online participants for statistical analyses. Descriptive statistics, including the mean scores for metacognitive awareness and social metacognitive awareness, can be found in Table 1.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table 1  Descriptive Statistics Comparing Students Online and Face-to-Face | | | | | |
|  | N | Metacognition | SD | Social metacognition | SD |
| Face-to-face | 261 | 3.985 | .035 | 3.805 | .042 |
| Online | 48 | 3.926 | .079 | 3.185 | .127 |
| Total | 309 | 3.976 | .032 | 3.708 | .043 |

In reviewing metacognitive levels of students face-to-face and online after the course, Levene’s test indicated that variances were equal. Data was transformed to have a normal distribution for metacognitive awareness scores. An independent samples *t*-test was conducted on the metacognitive scores. This revealed no significant difference (*p*=.491) between metacognitive awareness scores of students taking the course online and students taking the course face-to-face.

Because metacognition could be a covariate in comparing social metacognition, the researcher tested the homogeneity of regression slopes to determine if an ANCOVA was necessary. The independent variable (student enrollment online or face-to-face sections) and the covariate (metacognition) did not interact [*F*(1, 305) = .311, *p*=.577, partial 2 = .001]. Thus, an ANCOVA was performed to determine if social metacognitive awareness scores were significantly different.

A one-way ANCOVA was performed on the dependent variable social metacognition. The independent variable was the version of the course the student took, online or face-to-face. The covariate was metacognition, which significantly adjusted the results. After accounting for the covariate (see Table 2 for adjusted means), the analysis indicated a significant difference in social metacognitive awareness scores for students online and face-to-face [*F*(1, 306) = 44.445, *p*<.001, partial 2 = .127]. This can be seen in Table 3. Despite having similar metacognitive scores, students online had significantly lower social metacognitive awareness scores than students taking the course face-to-face.

|  |  |  |
| --- | --- | --- |
| Table 2  Adjusted Means for Social Metacognitive Awareness | | |
| Course Format | Adjusted *M* | Unadjusted *M* |
| Online | 11.183 | 10.886 |
| Face-to-face | 14.931 | 14.985 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Table 3  ANCOVA Results for Social Metacognition | | | | | | | |
| Source | SS | *Df* | MS | *F* | *p* | partial 2 | Observed powerb |
| Corrected Model | 4011.540 | 2 | 2005.770 | 156.804 | .000 | .506 | 1.000 |
| Intercept | 640.889 | 1 | 640.889 | 50.102 | .000 | .141 | 1.000 |
| Metacognition | 3330.429 | 1 | 3330.429 | 260.361 | .000 | .460 | 1.000 |
| Online or not | 568.525 | 1 | 568.525 | 44.445 | .000 | .127 | 1.000 |
| Error | 3914.231 | 306 | 12.792 |  |  |  |  |
| Total | 71541.372 | 309 |  |  |  |  |  |
| Corrected Total | 7925.771 | 308 |  |  |  |  |  |

Students online had lower means for all items in the SMAI (Table 4). There were not any questions in which online students felt they were stronger in their social metacognitive awareness than face-to-face students. Instead, across the board, students in the online course rated their social metacognitive awareness as lacking when compared to those in the face-to-face course.

Table 4

Mean SMAI Items

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Question | Online (N=48) | SD | Face-to-face (N=261) | SD | Total mean | SD | Difference |
| KSC1 | 3.350 | .180 | 4.020 | .059 | 3.920 | .059 | 0.670 |
| KSC2 | 3.400 | .168 | 4.150 | .052 | 4.040 | .053 | 0.750 |
| KSC3 | 3.400 | .178 | 4.130 | .057 | 4.020 | .057 | 0.730 |
| KSC4 | 3.400 | .173 | 4.050 | .061 | 3.940 | .059 | 0.650 |
| KSC5 | 3.330 | .194 | 4.150 | .061 | 4.020 | .062 | 0.820 |
| KSC6 | 3.230 | .179 | 3.910 | .056 | 3.800 | .057 | 0.680 |
| KSC7 | 3.000 | .191 | 3.720 | .067 | 3.610 | .065 | 0.720 |
| KSC8 | 3.290 | .174 | 4.080 | .056 | 3.950 | .057 | 0.790 |
| KSC9 | 3.190 | .165 | 3.990 | .060 | 3.870 | .059 | 0.800 |
| KSC10 | 3.500 | .158 | 3.960 | .054 | 3.890 | .053 | 0.460 |
| KSC11 | 3.790 | .171 | 4.350 | .053 | 4.270 | .053 | 0.560 |
| RSC1 | 3.100 | .166 | 3.560 | .070 | 3.490 | .065 | 0.460 |
| RSC2 | 2.980 | .172 | 3.860 | .060 | 3.720 | .060 | 0.880 |
| RSC3 | 3.190 | .183 | 3.820 | .067 | 3.720 | .064 | 0.630 |
| RSC4 | 3.020 | .194 | 3.600 | .072 | 3.510 | .069 | 0.580 |
| RSC5 | 3.350 | .199 | 3.830 | .070 | 3.750 | .067 | 0.480 |
| RSC6 | 3.100 | .153 | 3.880 | .061 | 3.760 | .059 | 0.780 |
| RSC7 | 3.670 | .167 | 4.200 | .056 | 4.120 | .055 | 0.530 |
| RSC8 | 2.980 | .175 | 3.340 | .072 | 3.280 | .067 | 0.360 |
| RSC9 | 2.940 | .189 | 3.560 | .071 | 3.460 | .068 | 0.620 |
| RSC10 | 3.210 | .176 | 3.750 | .064 | 3.670 | .061 | 0.540 |
| RSC11 | 3.130 | .183 | 3.850 | .063 | 3.740 | .062 | 0.720 |
| RSC12 | 2.580 | .204 | 3.300 | .078 | 3.190 | .074 | 0.720 |
| RSC13 | 3.380 | .194 | 3.920 | .067 | 3.830 | .065 | 0.540 |
| RSC14 | 3.150 | .176 | 3.790 | .062 | 3.690 | .060 | 0.640 |
| RSC15 | 3.310 | .166 | 3.920 | .062 | 3.830 | .059 | 0.610 |
| RSC16 | 3.150 | .166 | 3.600 | .070 | 3.530 | .065 | 0.450 |
| RSC17 | 2.690 | .174 | 3.510 | .069 | 3.390 | .066 | 0.820 |
| RSC18 | 2.920 | .183 | 3.470 | .075 | 3.380 | .070 | 0.550 |
| RSC19 | 1.900 | .184 | 2.320 | .084 | 2.250 | .077 | 0.420 |
| RSC20 | 2.540 | .202 | 3.390 | .071 | 3.260 | .070 | 0.850 |
| RSC21 | 3.580 | .206 | 4.070 | .058 | 3.990 | .059 | 0.490 |
| RSC22 | 3.170 | .164 | 3.870 | .061 | 3.760 | .059 | 0.700 |

**Discussion**

While students in the online and face-to-face versions of the course had statistically similar metacognitive awareness scores, they had significantly different social metacognitive awareness scores. This indicates that students in the online information literacy course were not able to socially regulate the group’s learning as well as students in the face-to-face version of the course. The online version of the course also had more students who withdrew from the course and more students with failing grades.

The biggest difference between online students and face-to-face students was the item, “My group considered several alternatives to a problem before we answered.” Online students had a mean of 2.98 to this response, while face-to-face students had a mean of 3.86. Perhaps discussing problems face-to-face provides the opportunity to brainstorm other avenues and possibilities that an asynchronous online course does not provide. Thus, instructors may need to include assignments or synchronous discussion sessions for collaborative groups that encourage brainstorming.

The item with the least difference was “My group periodically reviewed information together to help ourselves understand important relationships.” The online students had a mean rating of 2.98 and face-to-face students had a mean rating of 3.34. It is possible that the idea of “understanding important relationships” was not a major concept covered by either face-to-face students or online students, so both tended to rate this as rather neutral.

The highest ranked item was the same for online and face-to-face students: “My group learned more when we were interested in the topic.” Online students gave this a mean of 3.79 and face-to-face students gave this a mean of 4.35. This shows the importance of having authentic topics that are relevant to the students if they are to do a group assignment. Having students choose their research topic together, or sorting them into groups based on their interest, will encourage learning. Still, this shows that even in the highest ranked items, online students did not feel as strongly as face-to-face students.

The lowest ranked item was also the same for both online (*m*=1.9) and face-to-face students (*m*=2.25): “My group drew pictures or diagrams to help each other understand while learning.” While this can be an effective metacognitive strategy, information literacy competencies may not seem to require diagraming or creating pictures. Since visual representations of concepts and ideas can be beneficial, though, instructors may need to work these activities in directly into a course to encourage students to, as the item mentioned above says, “understand important relationships.”

Of course, one possible conclusion based on this data is that online students should not complete collaborative information literacy projects. There are a few issues with this position, though. Creating a sense of community is very important to online learning. Students who feel less isolated and more like they are part of a learning community are less likely to drop out of the course.32 Student-to-student interaction has been shown to benefit students learning online.33 Indeed, this type of interaction has been shown to have a significantly larger effect size than student-teacher interaction on both learning and attitudes.34 Additionally, there is an increased expectation for collaboration online in the workplace,35 so providing students with online collaboration opportunities prepares them for the online collaborative work they will do in the future.

What is clear here is that collaborative online learning in an information literacy course does not automatically engender social metacognitive strategies that enable effective group learning. While some have theorized that collaborative work provides metacognitive scaffolding because thought processes that are typically internal must become external,36 more intervention is needed to ensure that students working online collaborative regulate and understand each other’s learning. Instructors cannot simply translate their face-to-face course online exactly as it is. More must be done to ensure that students have both the connections that are sometimes lost in the online environment and the support to maintain these connections. They must motivate them to engage with the content and each other, and encourage social presence so that the students feel like they are interacting with real people, and that they have a stake in the success of the group.

***Limitations***

The online course in this study was asynchronous. A synchronous course may allow for higher levels of social metacognition since students may have more opportunities to interact with each other in real time. In a study comparing asynchronous and synchronous class discussions, students involved in synchronous discussions showed increased motivation and greater interactivity among participants.40 While asynchronous discussion provided more time to reflect and participate more deeply cognitively,41 providing both synchronous and asynchronous discussion could allow for more social connections and support for task completion, and therefore may increase social metacognition.

It is also important to note that students involved in this study were almost all freshmen. Older adults have performed better in groups than individually in an online environment,42 so graduate students and upper-level undergraduates may have different social metacognitive awareness after completing an online collaborative project. Future research could explore the ability of students in other collaborative environments at other levels to engage in information literacy learning and collaborating.

**Recommendations**

As this study has shown, students will not always be able to work effectively together in an online situation, so online instructors can implement methods that will improve the collaborative group process. Use scripting software that asks students to consider their metacognitive activities throughout the process.37 Macro-scripts can guide students through the process of planning, monitoring, and evaluating their learning through a group project, while micro-scripts provide specific ideas of what to say and how to interact at various points of a project.38 This sort of metacognitive scaffolding has been shown to have a positive impact on learning outcomes for students.39 In the case of this study, online students had a mean of 3.35 for the item “My group set specific goals before we began a task.” Scripting could ensure that students have to set goals and plan.

Use collaborative planning tools or project management tools for students to set due dates, communicate with each other, and share resources. Instead of relying entirely on LMS planning tools, free planning tools, like Basecamp, Zoho, Trello, and other services, make it easy for students to work together. Group coordination and communication in the LMS used in this study, Blackboard, was found to be lacking, so students used other resources (Google Docs, Slack, Skype, GroupMe, etc.) to make their communication easier. Providing a particular tool or set of tools that enables easy communication and collaboration takes away another barrier to group knowledge building. Since the question with the biggest difference between the online and face-to-face version of the course was “My group considered several alternatives to a problem before we answered,” easy communication can allow for more responses and ideas being exchanged.

**Conclusion**

While some studies indicate that online group learning can be as effective in increasing learning as face-to-face collaborative learning,43 this study showed that this is not a given. Information literacy collaborative instruction online may appear to be an effective way of modeling some of the features of the ACRL framework, particularly when we consider issues of metaliteracy where the information environment encourages collaborative co-creation of knowledge. With collaborative online learning, though, especially for undergraduates, appropriate tools and structuring is necessary for an effective experience.44 Information literacy instructors who wish to teach online and create effective student-to-student interaction must make sure to engage in the scaffolding, instructional design, and instructor support that is required for deep learning in groups online.

Integrating the ACRL framework more into the core of the learning outcomes of the course, students in the online version in 2017 had more success, though there were still issues with some of the collaborative online work. Students were asked to address a specific community problem from a specific stakeholder position, and to present recommendations based on research to an audience in the form of a website. This made the assignment more authentic. Students also had clearer roles and specific assignments in the group discussion board that were graded, which ensured more individual responsibility and group interaction. Those who were not participating were removed from the group. This reveals how rethinking of assignments and providing clearer expectations for group communication can increase achievement in collaborative online learning environments.

Future research should include qualitative research to support the findings comparing social metacognition online and face-to-face for a collaborative information literacy project. This would help to confirm the validity of the SMAI. Additionally, because the online course is relatively new in its current form at the institution, comparing the social metacognitive awareness of students enrolled in established, rigorous online learning environments may be informative. Online information literacy courses with higher levels of social metacognition could provide librarians and other instructors with a better understanding of how to encourage deep learning and collaboration in a distance environment. Additionally, seeing how full integration of the ACRL framework and its impact on collaborative learning, especially because of its emphasis on the situatedness of research in conversation with others, would be particularly enlightening.

While online learning can never exactly replicate the face-to-face environment, librarians can make an effort to encourage planning, brainstorming, and collaborative problem-solving as students research together online. The online environment provides a rich set of interventions and tools that enhance group projects, and understanding the challenges of collaboration online while using pedagogical and technological strategies to overcome these will allow librarians to create accountability of group members and a deeper student experience. If librarians do not have the appropriate professional development that emphasizes instructional design and effective online pedagogy, students will flounder in the course. The student struggle is compounded with an online group assignment if they are asked to regulate the learning of others’ and their own without any strategies or tools to assist them. Modeling these strategies and providing these tools does not guarantee every group online will be successful, but it does reveal to students the ways in which professionals, activists, and communities collaboratively research and co-create knowledge that is more informative, dynamic, and useful than that created by an individual alone.

**Notes**

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APPENDIX A

Collaborative Assignment

**Purpose**: Since we live in an information-rich environment, we must be able to find information from a variety of sources, and we must be able to fulfill a plurality of nformation needs. This assignment will use many of the skills you developed in this course. Additionally, working well collaboratively is essential for both your academic tenure and future career. Thus, this assignment will be a group assignment. You will be evaluating the effort put forth by your group members, which will be factored into the grade.

**Skills**: Construct and refine searches in library resources to identify appropriate sources

Critically evaluate search strategies used

Evaluate resources based on established criteria of Currency, Relevance, Authority, Accuracy, and Purpose (CRAAP)

Cite sources correctly in MLA or APA

            Work collaboratively with a group to complete an assignment

**Knowledge**: This assignment will broaden your knowledge of where reliable information can be found so that you will be able to find resources to meet an information need. It will also give you some tools to evaluate information so that you can become a savvy consumer of information.

**Assignment**: Your group will collaboratively determine a research question based on a broader topic. You will then conduct a search in the resources described in this course and critique your search. You should include this information in a report that details:

* The**topic and research questions**. This will also include a description and justification of the types of sources that will best meet your information needs.
* Your group’s **search strategy**, including
  + At least 3 search tools you used (e.g., discovery system, ProQuest Central, and Academic Search Elite)
  + The terms / subject headings / keywords you searched
  + What difficulties you faced, and
  + (optional) How you used sources to find other sources
* A **critique of your group’s search strategy** that explains what you did well and what you would improve if you had time to do so. Consider:
  + Did you use appropriate databases or search engines?
  + Did you use the best search terms?
  + Did you try alternate terms?
  + Did you use Boolean searching?
  + What could you have done to make your searching more effective?
* 5 useful **sources you found in your search** **cited** with a **CRAAP analysis**included for the source under each citation.
* At least one [Creative Commons](https://search.creativecommons.org/) image relevant to your Capstone, placed appropriately in the text, and cited correctly.

**Format**: The citations should be MLA 8th edition **or** APA 6th edition format (be consistent). This can be completed in DropBox, OneDrive, Google Docs, or the Blackboard Wiki. You can consider digital formats other than a paper – a slideshow, a website, or some other format are acceptable as long as you meet the criteria.

**Length**: The following are approximate lengths for each section:

* Topic, research questions, and source justification: 100-200 words
* Search strategy: 300-500 words
* Critique of search strategy:  100-250 words
* 5 sources with CRAAP test: 150-200 each / 750-1000 words
* One Creative Commons image

APPENDIX B

SOCIAL METACOGNITIVE ASSESSMENT INVENTORY

RSC1 My group asked periodically if we were meeting our goals.

RSC2 My group considered several alternatives to a problem before we answered.

KSC1 My group understood our intellectual strengths and weaknesses.

RSC3 My group thought about what we really needed to learn before we began a task.

RSC4 My group discussed how well we did once we completed a task.

RSC5 My group set specific goals before we began a task.

KSC2 My group knew what kind of information was most important to learn for our tasks.

RSC6 My group made sure we considered all options when solving a problem.

KSC3 My group was good at organizing information.

RSC7 My group focused our attention on important information.

KSC4 My group had a specific purpose for each strategy we used.

KSC5 My group knew what the instructor expected us to learn.

KSC6 My group used different learning strategies depending on the situation.

RSC8 My group asked if there was an easier way to do things after we finished a task.

RSC9 My group periodically reviewed information together to help ourselves understand important relationships.

RSC10 My group asked questions about the material before we began on the task.

RSC11 My group considered several ways to solve a problem and chose the best one.

RSC12 My group summarized what we learned after we finished.

RSC13 My group asked others for help when we didn't understand something.

KSC7 My group motivated each other to learn when we needed to.

RSC14 My group analyzed the usefulness of strategies while we problem solved.

KSC8 My group used each member’s intellectual strengths to compensate for others’ weaknesses.

RSC15 My group focused on the meaning and significance of new information.

RSC16 My group created our own examples to make information more meaningful.

KSC9 My group was a good judge of how well we understood something.

KSC10 My group used helpful learning strategies automatically.

RSC17 My group paused regularly to check our comprehension.

RSC18 My group asked how well we accomplished our goals once we finished.

RSC19 My group drew pictures or diagrams to help each other understand while learning.

RSC20 My group asked if we had considered all options after we solved a problem.

RSC21 My group tried to translate new information into our own words.

RSC22 My group changed strategies when we failed to understand.

RSC23 My group read instructions carefully before we began a task.

RSC24 My group re-evaluated our assumptions when we became confused.

RSC25 My group organized our time to best accomplish our goals.

KSC11 My group learned more when we were interested in the topic.

RSC26 My group broke down the project or task into smaller steps.

RSC27 My group focused on overall meaning rather than specifics.

RSC28 My group asked questions about how well we were doing on the task.

RSC29 My group asked if we learned as much as we could have once we finished a task.

RSC30 My group stopped and went back over new information that was not clear.