13

Instructor-Librarian Collaboration to Improve Students' Searching, Evaluation, and Use of Scientific Literature

Sarah Bankston, Micah J. Waltz, and Heather K. Moberly

Introduction

This case study is written by a writing instructor and two librarians. Across five semesters, they developed a learning environment to foster students' information and scientific literacy in a writing-intensive course.

In the literature of the Scholarship of Teaching and Learning (SoTL), Hutchings' "four questions" are frequently mentioned, these questions being broad categories of the SoTL work that occurs.[1] This project did not begin as a SoTL project, but rather as a project to identify approaches to foster scientific literacy in the scientific writing classroom, and, therefore, this project falls in the "what works" category of questions. This collaboration required reflection and iteration as questions about student learning evolved.

Finding and evaluating information is vital to comprehending and using scientific information to inform conclusions and perspectives. These skills are fundamental and involve at least three categories of a composite definition of scientific literacy: content knowledge, understanding scientific practices, and identifying and judging appropriate scientific expertise.[2] These same skills are crucial for the development of information literacy, the interrelated skills employed to discover, evaluate, and use information.[3] A core component of scientific literacy is drawing evidence-based conclusions. The development of information-seeking skills within the science classroom represents an intersection between the scientific processes involved in scientific literacy and the information-seeking aspect of information literacy.

Semester 0: Identifying the Need for Collaboration

Texas A&M University, a Tier One land-grant institution, is the sixth-largest university in the United States. The university requires undergraduate students to take two field-specific writing-intensive courses. In the undergraduate Biomedical Sciences program, one choice is VIBS 310: Biomedical Writing, a one-credit course that meets once a week for fifty minutes and focuses on writing for various audiences in biomedical fields. The major assignment includes outlining a biomedical review article, writing the introduction, and writing one of the body sections. Students are required to find and incorporate at least twelve scientific articles for this assignment—nine primary and three secondary. They often select review article topics that are relevant to their personal lives, such as pets, health issues, or job shadowing.

When the Instructor began teaching VIBS 310, he contacted his subject librarian, Librarian1, to guest lecture because of the intensive literature-searching component. In a previous course, the Instructor felt he could adequately break apart the searching process to teach it because of a background in pedagogy of teaching, relatives who were librarians, and past searching experience. However, students were unable to demonstrate competent searching skills in their final drafts. Upon reflection, the Instructor realized he was unable to explain the *why* and *how* of the searching process well enough for students to learn.

Semester 1: The Beginning

The Instructor invited Librarian1 to guest lecture. At the request of the Instructor, the library session was a one-shot guest lecture without hands-on activity time, covering "everything about the library and how to search." Following the lecture, the Instructor and Librarian1 discussed the possibility that adequate support for the assignment required a workshop-style class with hands-on experience. After evaluating student final drafts, the Instructor realized that the students would benefit from hands-on practice because they chose weak or tangentially related articles. Similar to the previous course he taught without Librarian1, it appeared the lecture had not significantly impacted students' learning. At the end of the semester, the Instructor and Librarian1 agreed on two things: the one-shot guest lecture would be replaced with a workshop-style searching session and Librarian1 would attend each class the next semester. This embedded-librarian model would test whether student learning was improved through increased librarian presence.[4] The "what works" question evolved from trying different approaches to find a way to enhance scientific literacy. The initial exploration addressed whether having a librarian involved in the class would improve student learning. This question changed after this semester to whether more intensive exposure to the librarian and library resources would have an impact on student learning.

The Instructor and Librarian1 brainstormed about why students struggled with their major project. Students could not demonstrate proficiency in searching the literature, understanding scientific articles, and evaluating study designs and evidence. The Instructor

and Librarian1 identified two overarching themes based on common student errors: identifying primary and secondary scientific literature and finding appropriate scientific literature as evidence to support a point. These themes lay at the intersection of science literacy and information literacy.

The pair hypothesized that the fundamental problem was students' inability to comprehend and evaluate scientific papers. Students could not evaluate a paper's content and identify whether it was appropriate for their purposes,[5] which is a necessary skill for making a data-driven decision. To develop this skill,[6] the Instructor decreased didactic lecture time to incorporate class discussions about assigned scientific literature.[7]

Using backward design, the Instructor identified what students should know by the end of the semester[8] regarding reading and evaluating scientific literature and then developed an informal formative assessment using small-group discussions.[9] For the next semester, the Instructor structured these discussions around specific elements in assigned readings, such as good or bad examples of methodologies. During these discussions, the Instructor listened to the group conversations. After the discussion, the Instructor had the groups report back to address questions and confirm student understanding.

Semester 2: Reflection and Evolution

Librarian2 was hired during the summer between semester 1 and semester 2 and was assigned the embedded librarian role, with Librarian1 assisting as needed. Librarian2 attended each class session and provided informal formative feedback during group discussions of selected readings. Librarian2 also led the library instruction session about literature searching and distinguishing primary versus secondary literature. The library session was moved to a computer lab so that students could actively engage with the content of the lecture, and Librarian2 provided formative feedback on the students' literature searches.[10]

Librarian2 provided formative feedback via written comments on an annotated draft of each students' reference list. Specifically, she provided feedback to the students on the correct identification of each article as primary or secondary, their ability to articulate the intended use of each article through annotations, and the accuracy of their citations in the selected style. Feedback about students' annotated drafts was provided within one week, to be used while revising their drafts.[11]

Providing this feedback was difficult because students failed to provide context for their literature searches. Students were supposed to provide annotations that summarized the content and explained how they planned to use each article in their assignment. Librarian2 found that many students only provided a summary of the article content without explaining its relevance to their draft. Therefore, it was unclear whether they had focused their literature search appropriately, making it difficult to assess *why* each article was chosen and if it was appropriate for the student's topic.

Although the formative feedback assessed whether students understood the concept of primary and secondary literature and whether they could correctly identify and select them, it was not effective for evaluating students' understanding of applying the information

found to support their scientific conclusions. Upon reflection, this feedback process was both time- and labor-intensive, requiring approximately forty hours during a single week of Librarian2's time to evaluate more than 500 references and annotations.

After turning in their assignment draft, students received feedback about the writing from a course teaching assistant (TA) in addition to Librarian2's feedback about the references. The drafts received comments and suggestions as formative feedback to help the students prepare the final version. Drafts either passed or failed. A passing or failing mark was a guideline for the students for how much additional time it would take to prepare the final version for grading. Although drafts were part of the assignment scaffolding, they were not designed to be included in grade calculations.

Due to limitations of the course management system software, the Instructor was unable to assess if changes made to the type, number, and use of references could be attributed to comments by the TA or Librarian2. Therefore, it was unclear whether students had used Librarian2's feedback. Additionally, when changes were made, it was unclear to the Instructor what the students' motivation was in choosing other sources: did they choose new sources in response to feedback or to avoid addressing feedback they didn't understand? Therefore, the Instructor was unable to assess whether they had learned to distinguish between primary and secondary sources. Since the final drafts were assigned numerical grades, they could not be quantitatively compared to the pass/fail drafts. Despite the feedback that was given, the Instructor did not notice improvement in how the references were used between the draft and final versions. In the last class of the semester, the students said the library lecture was useful and they found the formative feedback helpful because they felt they were able to identify more appropriate literature for their projects.

Semester 3: Reflection and Evolution

In preparation for semester 3, Librarian2 reflected on the embedding experience and decided that attending every class was not a wise use of time. Although student feedback indicated the librarian presence was helpful, often students looked to Librarian2 for additional writing support rather than library expertise. The Instructor and Librarian2 met and revised her role, deciding on strategic visits to the class for one library instruction session and three class-wide editing workshops that explicitly targeted incorporation of literature. Again, the "what works" question shifted because of student performance: would multiple structured and intentionally designed sessions involving the librarian improve student learning?

In semester 2, weekly discussions about assigned readings highlighted that students were struggling with identifying primary and secondary literature. To address this problem in semester 3, the Instructor added basic instruction about study design to help the students appropriately identify different types of primary and secondary literature.[12] The weekly discussions were modified to reinforce[13] students' ability to identify different types of primary and secondary literature before selecting articles for their assignment.

To provide contextualized feedback to students about their literature search and hold them accountable for this feedback, the Instructor and Librarian2 met individually with each student.[14] Each meeting was ten minutes, with fifty meetings scheduled in one

week. The Instructor and Librarian2 each fulfilled specific roles to accomplish everything the meetings were intended to cover. The Instructor provided feedback about the scope of the students' topic as it related to the project. Librarian2 provided feedback about reference formatting. Both the Instructor and Librarian2 gave feedback about the students' identification of each of the twelve articles as primary or secondary and about whether they had selected the appropriate number of each type for the draft.

In the meetings, the Instructor and Librarian2 addressed misconceptions about primary and secondary article identification, talked students through scoping their assignments so they were not tackling topics that were overly large for the assignment, and corrected formatting errors.[15] Often, while the students were explaining why they had identified an article as primary or secondary, they would self-identify flawed logic and change their identification.[16]

These meetings were intense and exhausting, but there was marked improvement in the students' final drafts. Student misconceptions highlighted misunderstandings about the assignment. This was the first semester that most students correctly identified and used the required number of primary and secondary literature. With this change, there was a shift in how students supported their points. They started to use secondary articles to support broader statements and primary articles to incorporate specific data into the assignment.

The instruction about how to differentiate between primary and secondary literature also created unanticipated questions which the Instructor and Librarian2 addressed at the individual meetings. Instead of using only experimental studies and narrative reviews as seen in the final drafts in previous semesters, students were bringing different types of articles to the meetings such as case reports, systematic reviews, theses, patents, and conference proceedings.

Semester 4: Reflection and Evolution

Given the variety of literature types, the Instructor and Librarian2 realized that they needed to address identifying literature beyond obvious experimental studies. For example, students were bringing in systematic reviews and struggling with how to identify them. This was a surprise because, after the initial one-shot lecture in semester 1, the Instructor and Librarian1 had intentionally decided not to discuss systematic reviews because students were not using them. The evolution of the instruction created a cycle where students were becoming more adept with finding scientific literature and, in turn, were finding more article types, which raised more questions to be addressed in instruction. In his call to develop principles for good SoTL practice, Peter Felten notes that student learning should encompass "not only disciplinary knowledge or skill development, but also the cultivation of attitudes or habits that connect to learning."[17] As the semester progressed, the students internalized the discussions on study types and thus became more critical of the articles they found. Student learning moved past foundational skill acquisition (searching for literature and identifying article types) to an internalized discipline-specific attitude or disposition (questioning methodology and understanding the role of study design).

Three major changes were made to the course. First, Librarian2 addressed common source-identification misconceptions during the library instruction session. Second, the Instructor changed the assigned readings for the class, selecting articles that illustrated a specific point, such as a particular error within the paper. Third, the Instructor developed an entire lecture to teach students how to identify types of study design. This emphasized how study design relates whether the article is primary or secondary and the level of evidence associated with that type of article.

The Instructor and Librarian2 split the single meeting with each student into two meetings to create more timely and manageable meetings. The first meeting resembled the previous semester's meeting, with the pair meeting jointly with the student to focus on identification of primary and secondary literature and reference formatting. The Instructor and student focused on style and syntax during the second meeting.

The in-class discussions and the individual meetings built upon each other and reinforced the concept of primary and secondary literature identification, and students demonstrated competency with this skill. In the in-class group discussions, students correctly identified readings as primary or secondary most of the time. In the individual meetings, students came prepared with their chosen articles already identified, and most either accurately identified their articles or self-corrected based on discussion with the Instructor and Librarian2. Additionally, students began asking more sophisticated questions about their articles. These student meetings became timely interventions for individual misconceptions.[18]

In addition to consistently identifying primary and secondary literature accurately, students were more thoughtful about letting the content of the articles they selected drive their writing rather than cherry-picking articles to support the points they wanted to make. They displayed attitudes and habits indicative of discipline-specific practice. Indeed, these behaviors align with the Research as Exploration frame from the Association of College & Research Libraries (ACRL) *Framework for Information Literacy for Higher Education*, with students "synthesiz[ing] ideas gathered from multiple sources" and exhibiting an "open-ended exploration and engagement with information."[19] Students wrote their assignments from a perspective better informed by the scientific literature because they were approaching scientific literature to become informed about a topic rather than choosing literature based on what they wanted to say, which demonstrated an increased competency in scientific literacy.[20]

Semester 5: Reflection and Evolution

The Instructor, Librarian1, and Librarian2 decided to focus on student search strategies because students were no longer struggling with identifying primary and secondary literature. This resulted in major changes in the fifth semester.

The study-design lecture introduced in semester 4 was retained, and it was reinforced during class discussions by having students identify the study design of assigned primary articles.[21] How the students were taught to search was changed by flipping the searching lecture with extensive hands-on searching and preparing the students beforehand with a

tutorial. The Instructor kept his syntax-and-style meeting and continued to individually meet with students about primary and secondary article identification. An additional individual meeting with the Instructor and one librarian or the other was added that focused on students' search strategies for their topic.

To flip the class, students were assigned the online *PubMed for Veterinarians* tutorial[22] prior to the class session. During the class, Librarian1 led a short session with mini-lectures and hands-on exercises about PubMed.[23] In the remaining class time, students searched for articles on their specific project, with feedback available from the Instructor, both librarians, and the course grader. This method combined just-in-time teaching with just-in-need learning in a hybrid approach: students used what they learned in their searching and received formative feedback.[24] The Instructor, librarians, and course grader addressed student questions and misconceptions while students were actively engaging in finding information for their project.[25] One advantage of having both the Instructor and librarians in the room is that when one could not answer a question, they could refer it to or consult with their colleagues. This modeled collaboration and use of different viewpoints while searching for articles, a critical component of information literacy.[26]

Meetings with individual students began the day after the searching lecture and spanned a two-week period. These meetings provided a new formative assessment to reinforce the skills taught in class. During these thirty-minute meetings, students sat at the computer with the Instructor and one of the librarians to demonstrate their search strategies. As students discussed their topics while searching, the Instructor and librarian helped brainstorm keywords and phrases to focus and re-scope their project as needed. Students used the new terms to search and discover whether there was sufficient literature for their re-scoped topic. Discussion of the searching was organic, with the student thinking aloud while they searched.

These time-intensive meetings actively engaged students with contextualized formative feedback about their project while they were working on it, facilitating just-in-need learning. Depending on the student's topic, the librarian introduced additional library databases. Most students were unaware of result filters or used them ineffectively. The Instructor and librarians showed students how to use PubMed Filters to refine results and Search Details to evaluate their search.

The final drafts students submitted were more focused than in previous semesters; students were no longer selecting a topic without reviewing the literature. The students used at least two articles per paragraph, supporting their main points. The logical flow between the ideas within their final drafts was also more cohesive because the literature they incorporated was appropriately focused. Students also used types of literature with appropriate levels of evidence to support their points.

Conclusion

This case study models how the instruction in a biomedical writing course has changed to better serve students' needs. When the Instructor started, the course did not emphasize searching

the literature and evaluating information. However, through the evolving collaboration with librarians, the Instructor recognized students' lack understanding about how to search and evaluate information. Teaching students searching is teaching a skill. Reading and analyzing papers moves them toward information evaluation. Meeting with each student to teach how to search for their specific topic is contextualized learning that is both activity- and reality-centered, stimulating deeper learning and conceptual change that engages students.

The next iteration of the "what works" question will address the sustainability of these meetings. The searching meetings helped students with the assignment and three recurring themes emerged: understanding the assignment's parameters, choosing a topic of feasible scope, and learning how to search for the appropriate topic. In the next semester, individual meetings will be shifted to small group sessions to address these three themes in a sustainable and replicable model.

Through iterative design and focusing on "what works," the instructional collaboration moved from a static lecture to a dynamic hands-on experience. The resulting instructional experience not only exemplifies an opportunity for students to "be engaged in the cultural and social practices of particular communities or professions"[27] but also shows what librarians bring to the classroom.

ENDNOTES

1. Pat Hutchings, introduction to *Opening Lines: Approaches to the Scholarship of Teaching and Learning* (San Francisco: Jossey-Bass, 2000).
2. National Academies of Science, Engineering, and Medicine, *Science Literacy: Concepts, Contexts, and Consequences* (Washington, DC: The National Academies Press, 2016).
3. Association of College and Research Libraries, *Framework for Information Literacy for Higher Education*, accessed August 23, 2017, http://www.ala.org/acrl/standards/ilframework.
4. Rowland and Knapp, "Engaged Scholarship and Embedded Librarianship," *Journal of Higher Education Outreach & Engagement* 19, no.2 (2015): 15–34. http://openjournals.libs.uga.edu/index.php/jheoe/article/view/1432/856.
5. Association of College and Research Libraries, *Framework*; National Academies of Science, Engineering, and Medicine, *Science Literacy*, 33.
6. Reinders Duit and David F. Treagus, "Conceptual Change: A Powerful Framework for Improving Science Teaching and Learning," *International Journal of Science Education* 25, no. 6 (2003): 671–88, https://doi.org/10.1080/09500690305016.
7. Jennifer K. Knight and William B. Wood, "Teaching More by Lecturing Less," *Cell Biology Education* 4, no. 4 (2005): 298–310, https://doi.org/10.1187/05-06-0082.
8. Grant Wiggins and Jay McTighe, *Understanding by Design* (Alexandria, VA: Association for Supervision and Curriculum Development, 2005), 13–21.
9. Vanessa Barker and Robin Millar, "Students' Reasoning About Basic Chemical Thermodynamics and Chemical Bonding: What Changes Occur During a Context-Based Post-16 Chemistry Course?," *International Journal of Science Education* 22 no. 11 (2000): 1171–200, https://doi.org/10.1080/09500690050166742; Jo Handelsman, Sarah Miller, and Christine Pfund, *Scientific Teaching* (New York: W.H. Freeman and Company, 2007), 27.
10. Knight and Wood, "Teaching More by Lecturing Less," 298–310; Wiggins and McTighe, *Understanding by Design*, 142, 152–56, 168–70; Handelsman, Miller, and Pfund, *Scientific Teaching,* 52.

11. Steinar Killi and Andrew Morrison, "Just-in-Time Teaching, Just-in-Need Learning: Designing Towards Optimized Pedagogical Outcomes," *University Journal of Educational Research* 3, no. 10 (2015): 742–50, https://doi.org/10.13189/ujer.2015.031013.
12. National Academies of Science, Engineering, and Medicine, *Science Literacy*, 32–33.
13. Barker and Millar, "Students' Reasoning," 1171–200.
14. Killi and Morrison, "Just-in-Time Teaching," 742–50; Donna King and Stephen M. Ritchie, "Learning Science Through Real-World Contexts," in *Second International Handbook of Science Education*, ed. Barry J. Fraser, Kenneth Tobin, and Campbell J. McRobbie (New York: Springer, 2012), 69–79.
15. Killi and Morrison, "Just-in-Time Teaching," 742–50.
16. Phyllis C. Blumenfeld, Elliot Soloway, Ronald W. Marx, Joseph S. Krajcik, Mark Guzdial, and Annemarie Palincsar, "Motivating Project-Based Learning: Sustaining the Doing, Supporting the Learning," *Educational Psychologist* 26, no. 3–4 (1991): 369–98, https://doi.org/10.1080/00461520.1991.9653139; Handelsman, Miller, and Pfund, *Scientific Teaching*, 29–30.
17. Felten, "Principles of Good Practice in SoTL," 122.
18. Killi and Morrison, "Just-in-Time Teaching," 742–50.
19. Association of College & Research Libraries, *Framework*, 7.
20. National Academies of Science, Engineering, and Medicine, *Science Literacy*, 32-33.
21. Barker and Millar, "Students' Reasoning," 1171–200.
22. Lisa Keefe, Heather K. Moberly, and Micah J. Waltz, "PubMed for Veterinarians," last modified October 2016, http://oaktrust.library.tamu.edu/handle/1969.1/158203.
23. Paul Baepler, J. D. Walker, and Michelle Driessen, "It's Not About Seat Time: Blending, Flipping, and Efficiency in Active Learning Classrooms," *Computers and Education* 78 (2014): 227–36, https://doi.org/10.1016/j.compedu.2014.06.006; Keefe, Moberly, and Waltz, "PubMed for Veterinarians."
24. Kathleen A. Marrs and Gregor Novak, "Just-in-Time Teaching in Biology: Creating an Active Learner Classroom Using the Internet," *Cell Biology Education* 3 (2004): 49–61, https://doi.org/10.1187/cbe.03-11-0022; Gregor M. Novak, Evelyn T. Patterson, A. Gavrin, and R. C. Enger, "Just-in-Time Teaching: Active Learner Pedagogy with WWW," paper presented at IASTED International Conference on Computers and Advanced Technology in Education, Cancun, Mexico, May 1998, http://webphysics.iupui.edu/JITT/ccjitt.html.
25. Wiggins and McTighe, *Understanding by Design*, 152–56; Handelsman, Miller, and Pfund, *Scientific Teaching,* 52.
26. Association of College and Research Libraries, *Framework*; Blumenfeld, Soloway, Marx, Krajcik, Guzdial, and Palincsar, "Motivating Project-Based Learning," 369–98.
27. O'Brien, "Navigating the SoTL Landscape," 13.

BIBLIOGRAPHY

Association of College and Research Libraries. *Framework for Information Literacy for Higher Education*." Accessed August 23, 2017. 2015. http://www.ala.org/acrl/standards/ilframework.

Baepler, Paul, J. D. Walker, and Michelle Driessen. "It's Not About Seat Time: Blending, Flipping, and Efficiency in Active Learning Classrooms." *Computers and Education* 78 (2014): 227–36. https://doi.org/10.1016/j.compedu.2014.06.006.

Barker, Vanessa, and Robin Millar. "Students' Reasoning About Basic Chemical Thermodynamics and Chemical Bonding: What Changes Occur During a Context-Based Post-16 Chemistry Course?" *International Journal of Science Education* 22, no. 11 (2000): 1171–200. https://doi.org/10.1080/09500690050166742.

Blumenfeld, Phyllis C., Elliot Soloway, Ronald W. Marx, Joseph S. Krajcik, Mark Guzdial, and Annemarie Palincsar. "Motivating Project-Based Learning: Sustaining the Doing, Supporting the Learning." *Educational Psychologist* 26, no. 3-4 (1991): 369–98. https://doi.org/10.1080/00461520.1991.9653139.

Duit, Reinders, and David F. Treagust. "Conceptual Change: A Powerful Framework for Improving Science Teaching and Learning." *International Journal of Science Education* 25, no. 6 (2003): 671–88. https://doi.org/10.1080/09500690305016.

Felten, Peter. "Principles of Good Practice in SoTL." *Teaching & Learning Inquiry* 1, no. 1 (2013): 121–25. https://doi.org/10.20343/teachlearninqu.1.1.121.

Handelsman, Jo, Sarah Miller, and Christine Pfund. *Scientific Teaching*. New York: W.H. Freeman and Company, 2007.

Hutchings, Pat. Introduction to *Opening Lines: Approaches to the Scholarship of Teaching and Learning*. San Francisco: Jossey-Bass, 2000.

Keefe, Lisa, Heather K. Moberly, and Micah J. Waltz. "PubMed for Veterinarians." Pubmed for Veterinarian tutorial documents collection. Last modified October 2016. http://oaktrust.library.tamu.edu/handle/1969.1/158203.

Killi, Steinar, and Andrew Morrison. "Just-in-Time Teaching, Just-in-Need Learning: Designing Towards Optimized Pedagogical Outcomes." *University Journal of Educational Research* 3, no. 10 (2015): 742–50. https://doi.org/10.13189/ujer.2015.031013.

King, Donna, and Stephen M. Ritchie. "Learning Science Through Real-World Contexts." In *Second International Handbook of Science Education*, edited by Barry J. Fraser, Kenneth Tobin, and Campbell J. McRobbie, 69–79. New York: Springer, 2012. ProQuest Ebook Central.

Knight, Jennifer K., and William B. Wood. "Teaching More by Lecturing Less." *Cell Biology Education* 4, no. 4 (2005): 298–310. https://doi.org/10.1187/05-06-0082.

Marrs, Kathleen A., and Gregor Novak. "Just-in-Time Teaching in Biology: Creating an Active Learner Classroom Using the Internet." *Cell Biology Education* 3 (2004): 49–61. https://doi.org/10.1187/cbe.03-11-0022.

National Academies of Science, Engineering, and Medicine. *Science Literacy: Concepts, Contexts, and Consequences*. Washington, DC: The National Academies Press, 2016. https://doi.org/10.17226/23595.

Novak, Gregor M., Evelyn T. Patterson, A. Gavrin, and R. C. Enger. "Just-in-Time Teaching: Active Learner Pedagogy with WWW." Paper presented at IASTED International Conference on Computers and Advanced Technology in Education, Cancun, Mexico, May 1998. http://webphysics.iupui.edu/JITT/ccjitt.html.

O'Brien, Mia. "Navigating the SoTL Landscape: A Compass, Map and Some Tools for Getting Started." *International Journal for the Scholarship of Teaching and Learning* 2, no. 2 (2008): 1–20. https://doi.org/10.20429/ijsotl.2008.020215.

Rowland, Nicholas J., and Jeffrey A. Knapp. "Engaged Scholarship and Embedded Librarianship." *Journal of Higher Education Outreach & Engagement* 19, no.2 (2015): 15–33. http://openjournals.libs.uga.edu/index.php/jheoe/article/view/1432/856.

Wiggins, Grant, and Jay McTighe. *Understanding by Design*. Expanded 2nd ed. Alexandria, VA: Association for Supervision and Curriculum Development, 2005. eBook Collection (EBSCOhost).