

How Do I Know If They Learned Anything?

Evidence-Based Learning and Reflective Teaching in a First-Year Learning Community

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Introduction

This case study illustrates the application of O'Brien's Scholarship of Teaching and Learning (SoTL) Compass¹ in the revision of curriculum to improve student learning in a first-year student learning community at the University of Kansas (KU). The University of Kansas is a four-year, public research university located in Lawrence, KS, offering 141 undergraduate majors in its ten degree-granting schools. In the fall of 2015, KU had an enrollment of 28,091 students of whom 19,224 were undergraduates and 4,187 were first-year students.

O'Brien's SoTL Compass represents an approach to SoTL research consisting of four interrelated questions that researchers can use to guide their teaching practice: "What will my students learn and why is it worth learning?," "Who are my students and how do students learn effectively?," "What can I do to support students to learn effectively?," and "How do I know if my teaching and my students' learning have been effective?" The authors of this case study used this Compass as a model to reflect on their teaching and their students' learning in an effort to modify and improve an integrated assignment for future iterations of the learning community. To align this project to the model, the authors modified O'Brien's Compass as illustrated in Figure 19.1.

This case study is organized around the four questions in the modified version (see figure 19.1) of O'Brien's SoTL Compass. First is a description of Learning Communities at KU and the students who are enrolled in the courses. Next, the authors explore their own

assumptions about their students and identify the key concepts and learning outcomes for the learning community. This is followed by an evidence-based analysis of student work on an integrated assignment from the first offering of the learning community in fall 2016. Finally, the authors discuss their revisions to the integrated assignment to improve learning in the second offering of the learning community in fall 2017.

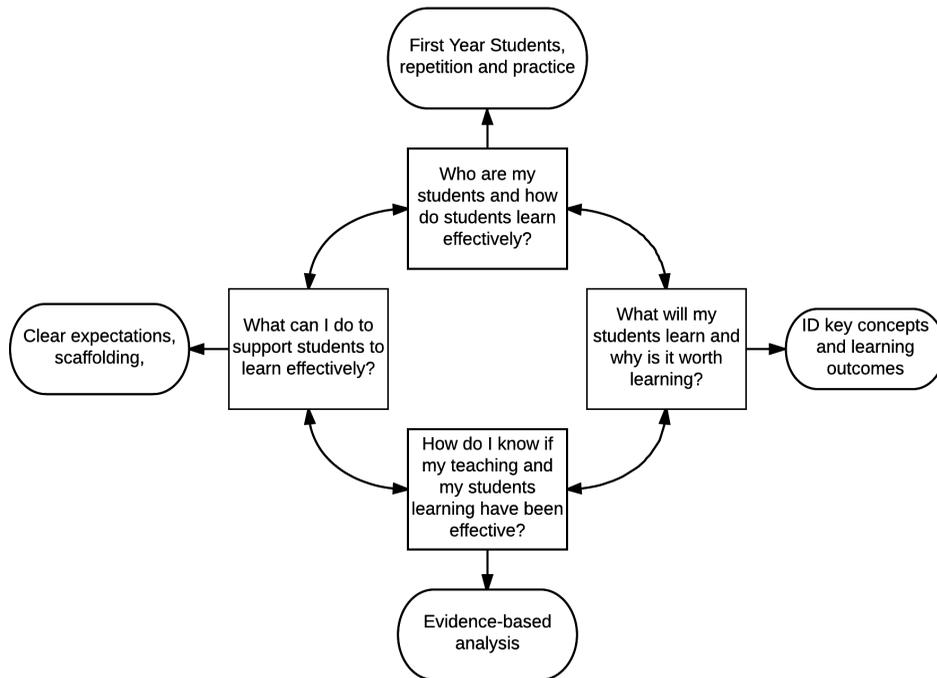


Figure 19.1. Modified O'Brien's SoTL Compass

Who Are My Students and How Do They Learn Effectively?

Learning Communities at KU are offered in one of two formats: residential or linked course. In residential Learning Communities, students enrolled in a small seminar course also live in the same residence hall. In a linked course learning community, a small seminar course is paired with a larger lecture course. This linked course learning community consists of a first-year orientation seminar (UNIV 101) taught by a librarian and a first-year geology course (GEOL 121) taught by a geology professor. Learning Communities at KU are designed to provide first-year students with high-impact educational experiences² in their first semester, including experiential learning, teamwork and problem-solving, as well as teaching students information literacy skills. These goals are met through an integrated assignment that assesses the transfer of skills, connection to experience and discipline, teamwork, reflection, self-assessment, and the application of information literacy skills.

While Learning Communities foster collaboration among students enrolled in the courses, they also require collaboration between the two course instructors. UNIV 101 supports GEOL 121 through the development of critical thinking, study skills, and information literacy. The connection between the two courses culminates in an integrated assignment that brings together key concepts from both courses and requires students to apply the concepts they have learned in both classes to new problems. Instructors who teach Learning Communities at KU participate in several course development workshops where they work together to design the integrated assignment. While these workshops did not explicitly use O'Brien's SoTL Compass, the questions "Who are my students and how do students learn effectively?" and "What will my students learn and why is it worth learning?" were central themes of these course development workshops.

Studies have revealed that teaching first-year students involves approaches that are different than teaching upper-level students; first-year students, particularly in their first semester, need to be offered classes that provide both academic rigor and scaffolded learning.³ If first-year students are not offered challenging material, they will not engage with the material, and thus are not likely to persist;⁴ however, the instructors also need to meet the students where they are and then structure the class so the students are guided to where they need to be. Effective first-year instruction, then, offers varied repetition, providing students multiple chances to practice and apply course material with prompt and detailed feedback as they are scaffolded toward deeper learning and understanding.⁵

Course development for Learning Communities at KU is cyclical in that both new and returning faculty and instructors participate in course design workshops in late spring and summer to prepare to deliver the courses in the fall semester. Since the authors of this chapter had already taught the learning community once, they utilized the course development workshops to examine the extent to which the integrated assignment both enabled and enhanced student learning.

What Will My Students Learn and Why Is It Worth Learning?

One of the core goals for the learning community is integrative learning. According to the Association of American Colleges & Universities (AAC&U) Integrative Learning VALUE Rubric,⁶ "Integrative learning is an understanding and a disposition that a student builds across the curriculum and co-curriculum, from making simple connections among ideas and experiences to synthesizing and transferring learning to new, complex situations within and beyond the campus." The purpose of the integrated assignment is to bring together elements from both courses to make connections among ideas and experiences and to transfer learning to new situations. The integrated assignment for this learning community has four outcomes:

1. Connect experience and academic knowledge—students will synthesize connections between two museum visits (experiences) and their academic knowledge of geology.

2. Connect to discipline—students will demonstrate a deepened understanding of geology.
3. Transfer of skills—students will apply skills learned in one situation to a new situation.
4. Reflection and self-assessment—students will evaluate changes in their own learning over time.

When designing the integrated assignment for the fall 2016 semester, the course instructors both developed assignments that required students to visit a campus museum. In GEOL 121, students visited KU's Museum of Natural History where they examined fossils. In UNIV 101, students visited KU's Spencer Museum of Art where they selected a work of art that connected to GEOL 121 course content. The integrated assignment required students to write a short essay making connections between the two museum visits and geology. The researchers' hope was that this essay would meet outcomes one (connections to experience and academic knowledge) and two (connections to discipline). In addition to this essay, students completed an information literacy exam to meet outcome three (transfer of skills). There is an information literacy unit included in all UNIV 101 courses that introduces students to a variety of source types, teaches students to evaluate information sources for authority, and introduces students to the research cycle. For this exam, students were asked a series of questions that required them to transfer these skills to new questions related to geology. The final component was a short essay to meet outcome four (reflection and self-assessment). This essay asked students to reflect on both their individual strengths and how these strengths contributed to teamwork, group effectiveness, group challenges, and changes in learning over time.

The researchers identified the key concepts from both GEOL 121 and UNIV 101 that they wanted to see in their students' work. For GEOL 121, students should be able to recognize and evaluate how evolution and geological change are ongoing processes, and what implications these changes have on their daily lives. Students should also be able to discuss the frequency and effects of extinction on life and its evolution, including the possibility of a sixth mass extinction. Evidence of these key concepts would indicate a deepened understanding of geology. For UNIV 101, students should be able to apply information literacy skills to the context of geology, as reflected in their information literacy exam. In their final essay, they also should be able to reflect on their strengths, the strengths of their teammates, group effectiveness and challenges, and evaluate the changes in their own learning over the course of the semester.

How Do I Know If My Teaching and My Students' Learning Have Been Effective?

The evidence in this case study is the integrated assignments from the eight students who were enrolled in the learning community in the fall of 2016. It is important to note that the evidence-based analysis of student learning discussed in this case study was decoupled from the grading as it occurred months after the semester ended.

In order to determine whether or not teaching was effective, it was necessary to assess the students' written work. To do so, the researchers first worked together to identify the key concepts from both GEOL 121 and UNIV 101 that they wanted to see in the students' work (see table 19.1). These concepts were drawn from the learning outcomes for each class as well as the programmatic goals of the Learning Communities program at KU, and thus mastering these key concepts would indicate a deepened understanding of geology, information literacy, and the students' own strengths.

Table 19.1. Assessment of Students' Written Work

Concept	Class	Assignment Piece	Class Average of Instructor-assigned codes
Recognize and evaluate how evolution and geological change are ongoing processes and what implications these changes have on their daily lives.	GEOL 121	Art Minute	0.50
Discuss the frequency and effects of extinction on life and its evolution, including the possibility of a sixth mass extinction.	GEOL 121	Art Minute	0.375
Identifying source types	UNIV 101	Information literacy exam	0.375
Identifying primary research methods	UNIV 101	Information literacy exam	0.875
Understanding the research cycle	UNIV 101	Information literacy exam	0.45
Reading scholarly articles	UNIV 101	Information literacy exam	0.875
Explaining peer review	UNIV 101	Information literacy exam	0.50
Identifying an information need	UNIV 101	Information literacy exam	0.875
Connecting two objects	GEOL 121 UNIV 101	Connection to experience	0.625
Connect object to geology	GEOL 121 UNIV 101	Connection to experience	0.625
Deepen understanding of geology	GEOL 121 UNIV 101	Connection to experience	0.25
Deepen understanding of self	GEOL 121 UNIV 101	Connection to experience	0.50
Understanding the application of Strengths to their work	GEOL 121 UNIV 101	Self-assessment essay	0.625
Explaining group work successes and challenges	GEOL 121 UNIV 101	Self-assessment essay	0.50
Self-assessment of learning and change in learning	GEOL 121 UNIV 101	Self-assessment essay	0.75

Once the researchers agreed on the framework for what effective student learning would look like, student work was coded depending if students attained (1) or failed to attain (0) the goal. This coding was done individually by each faculty member and then any discrepancy between the two codes was discussed. This process ensured that the final assigned code reflected both disciplinary viewpoints (geology and information literacy) about what successful student learning looked like. These values were then averaged in each category across all of the students.

The integrated assignment began with a visit to the campus art museum. For this assignment (the Art Minute), students selected an artwork from the museum and wrote a short essay describing, in detail, how the selected piece connected with geology topics. The only guidance toward making connections to the discipline of geology was a bullet point in the assignment prompt that said, "Describe, in detail, how the selected piece connects with your Geology 121 topic." Only half of the students (0.50) recognized and evaluated how evolution and geological change are ongoing processes and what implications these changes have on the students' daily lives, and even fewer (0.375) discussed the frequency and effects of extinction on life and its evolution, including the possibility of a sixth mass extinction. On the whole, students exhibited a very superficial understanding of geology and loose connections, at best, between the two museum visits.

The next section of the integrated assignment was an exam that required students to apply information literacy skills to their geology course. For example, in UNIV 101, students were introduced to a variety of source types, including scholarly sources, learned about peer-review, discussed primary research methods, practiced reading scholarly research articles, and learned how to identify information needs. The exam included questions to test this knowledge. Based on the instructor-assigned codes, students generally demonstrated a good understanding of primary research methods (0.875), reading scholarly articles (0.875), and identifying an information need (0.875). One major shortcoming on this exam was students' understanding of source types (0.375). This was disappointing, considering several days were spent evaluating different source types in the context of UNIV 101. Another weak spot was students' understanding of the peer-review process with only half (0.50) of students attaining key concepts. Some students described peer-review as experts providing their thoughts and opinions rather than an expert review of evidence and facts. Additionally, when asked to outline the steps of the research process to a research question in the field of geology, some students (0.55) simply repeated the steps learned in UNIV 101 rather than frame the steps in the context of geology.

Finally, students were asked to write a reflection and self-assessment. Students fell short when discussing their own strengths (.625) and were even weaker (.50) when discussing the strengths of others and how this impacted group effectiveness and/or created challenges within the group. And while a majority of students (.75) did discuss how their learning changed over the course of the semester, their writing did not convey a realization that learning occurred nor any specific growth moments or deepened understanding of their learning.

What Can I Do to Support Students to Learn Effectively?

One of the main takeaways from the evidence-based analysis was the need to be more explicit in the integrated assignment prompt, to provide examples of the kinds of connections the instructors expect students to make, and to scaffold the steps toward the integrated assignment. Both instructors agreed to continue the museum visits because they are generally enjoyed by students and create an experiential learning opportunity. To make the experience more meaningful and targeted to the learning community, the instructors worked with the art museum staff to identify specific works from the collection that related to the themes from the geology course (climate change, evolution, extinction, etc.). The museum had a special exhibit containing works related to the environmental impact on soils that the class could visit as part of this assignment. In addition to limiting student choice of artwork to works connected to course content, students were also required to watch a video on climate change and focus on one reading from GEOL 121 in preparation for the art museum visit. Finally, to help the students make connections between both museum visits, the instructors asked the students to read an article on “Cabinets of Curiosities”⁷ and write a concluding essay about museum collections and how they deepen understanding of course content. It is the researchers’ expectation that scaffolding the assignment to include specific works of art and supporting materials to add context to the experience will provide the necessary structure for students to make deeper connections to geology.

The exam portion of the integrated assignment did not need much revision, but rather revisions were made to the delivery of this content throughout the information literacy unit in UNIV 101. The question on the exam about peer-review resulted in multiple student responses about the “opinions of experts.” Next time, more time will be spent discussing source types in different disciplines and that peer-review is not about the thoughts and ideas of experts but rather about evidence and facts. Last, in the exam, students were asked to apply the steps of the research process to a hypothetical research question in geology. Most student responses just repeated the steps, rather than put the steps into a disciplinary context. The UNIV 101 instructor modified the portion of the information literacy unit that teaches the research cycle to include examples of research in different disciplines and asks students to think about these steps using real-life research examples. The research cycle is modeled by course instructors, and sample research questions are developed and discussed in class to provide an opportunity to practice articulating the steps with a discipline-specific example.

At the beginning of the semester, students were asked about their understandings of geology topics, including climate change, evolution, and extinction. For the new integrated assignment, students are presented with data collected from the class at the beginning of the semester and asked to discuss how their learning and understanding of these concepts have changed over the course of the semester. Additionally, the final portion of the new integrated assignment expands on learning in terms of information sources and communicating science. Students are asked to consider the types of information sources that expose the

general public to science and compare these to the scholarly sources and readings from their GEOL 121 class. Through this new integrated assignment, the instructors hope to see the deepened understanding of geology that they did not see in the first offering of the learning community.

Conclusion

Using actual student work as data, the instructors assessed whether or not the goals of the learning community were met. What began with a simple “What worked, what didn’t work?” question resulted in a redesign of learning experiences to better measure teaching effectiveness and student learning. Engaging in SoTL via assessment of student work in a learning community is ideal since the outcome measured through the integrated assignment does not focus on content but rather the application of skills such as critical thinking, information literacy, and the students’ own reflections on their learning. In reviewing student work, the authors focused on the application of key concepts and how to improve both the integrated assignment prompt and the delivery of key concepts throughout both courses. This process was a good reminder of the need to be explicit and specific in assignment prompts, in particular for first-year students.

ENDNOTES

1. Mia O’Brien, “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.
2. George D. Kuh, *High-Impact Educational Practices: What They Are, Who Has Access to Them, and Why They Matter* (Washington, DC: Association of American Colleges & Universities, 2008).
3. Bette Lasere Erickson, Calvin B. Peters, and Diane Weltner Strommer, *Teaching First-Year College Students* (San Francisco: John Wiley & Sons, 2009).
4. Thomas F. Nelson Laird, Daniel Chen, and George D. Kuh, “Classroom Practices at Institutions with Higher-than-Expected Persistence Rates: What Student Engagement Data Tell Us,” *New Directions for Teaching and Learning* 115 (2008): 85.
5. Erickson, Peters, and Strommer, *Teaching First-Year College Students*.
6. Association of American Colleges and Universities, “Inquiry and Analysis VALUE Rubric,” 2009, <https://www.aacu.org/value/rubrics/inquiry-analysis>.
7. Melody Amsel-Arieli, “Cabinets of Curiosities (Wunderkammers),” *History Magazine* 13, no. 6 (August/September 2012): 40.

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