

Reflections on WDI-funded supplement to the ERS313 course. By Marc Laflamme

****I am interested in running the project again in 2017****

First off, many thanks for the generous funding which allowed us to hire a dedicated TA to help deliver an enhanced term-project in my Sedimentology course (ERS313). The project goal was to provide a real-life research experience by having students construct an NSERC grant proposal. The funding specifically allowed for 32 hrs of TA time, which was dedicated to help with rubric construction, evaluation, and hands-on interactions between the students and the TA.

- a) What did you do? What happened with regard to the project—i.e., what precisely did you do, what did your TAs do, etc.? Did you do what you planned to do, and if not, why not? Why? Did it change for reasons specific to this class/this year, or for reasons of general practicality given the context?

First off, I divided the project goal of writing a high-quality research proposal into a series of scaffolded activities that made the final goal more manageable. This included the production of 1) an Annotated Bibliography, 2) the NSERC first draft, 3) an NSERC peer-review, and 4) the final report. We (the TA, Michael Debraga (RGASC+Bio), and myself) spent a significant amount of time designing rubrics that would highlight the benefits of each activity. These rubrics were provided to the students ahead of time, thus allowing them to tailor the activities towards ultimate success. The rubric philosophy was also discussed in class, highlighting how best to use them in forwarding their goal of producing a research proposal. One specific activity I was particularly proud of came from discussions among the three of us, resulting in a lab activity where the students constructed the final rubric for their assignment. This metacognitive activity allowed student to highlight what they believed was the most important aspects of their proposal (by assigning a higher grade for a specific section, for instance), and broke down each section into the important components to achieve the best grade. This was also done as a group activity, so students learned from their peers as well. This activity had a further goal as well – without the students even knowing it, they were constructing an outline of their research project, and populating it with the important factors leading to success. The TA also provided direct critical feedback on each of the scaffolded activities, meaning students were able to improve their research capabilities. I also brought in several guest speakers, including Librarians and RGASC writing experts, to aid in research development and writing skills. Finally, I also had a peer-review exercise that allowed students to submit an initial draft of their work that got evaluated by myself, the TA, and one anonymous student. This allowed students to gain an appreciation for peer-review, experience both sides of a publication, gain a familiarity with how project success is judged, and also learn through their peers how to improve their writing.

- b) How did it work (objective)? What do you know about the project's results **with regard to the learning objectives** from objective testimony (e.g., analysis of student writing produced)?

Overall, I believe the project was a real success. I measure this success based on the student evaluations I received:

Student 1: *"I especially liked the NSERC project. I felt as though it was one of the more "real" projects I've done. A project that truly had a real world application."*

Student 2: *"I also loved the idea of the mock NSERC Proposal"*

13. The course provided instruction on how to critically evaluate ideas.

1-2 no students, 3 – Moderate (2 students), 4 – mostly (4 students), **5 – A great deal (6 students)**

G-5. The course instructor (Marc Laflamme) highlighted the connections between theory, practice, and research in the course.

1-3 no students, 4 – mostly (2 students), **5 – A great deal (10 students)**

R-7. The course provided opportunity for me to develop my paper writing skills:

1-2 no students, 3 – Moderate (3 students), 4 – mostly (2 students), **5 – A great deal (7 students)**

- c) How did it work (subjective)? What do you know about the project's results **with regard to the learning objectives** from subjective testimony, potentially including 1) instructor's assessment, 2) TA assessments, 3) student assessment?

Some students spoke to me in person as well; one particularly memorable exchange involved a student asking for my permission to use this exercise when putting together their real NSERC proposal (i.e. they wanted to use the same project proposal in a real application). It was rather funny when they realized that this was the entire goal, and that they had already a leg up when constructing their proposal. On another note, this is the third year that I run this exercise, and I can attest to the fact that the proposals this year were a tier above previous years, even though the overall average for my class (i.e. mean class average for the final grade) this year was lower than last year. Of course this could be due to many different factors, but the improvement in the quality of the proposals was clear.

- d) What have you learned? What worked best? What didn't work? What do you know now that you didn't know at the start of the year? How do you feel overall about the project? Did it accomplish the goals that motivated you to propose it?

The scaffolding and rubric constructions worked best. Both activities led to direct improvements in overall research skills and writing ability. What didn't work as well was the project selection part of the proposal. I had hoped that a dedicated lab period with a librarian present would have led to better outcomes in terms of selecting research directions. Students did not respond well to the library exercise, and still felt lost when it came to deciding what their research project was going to be. In future, I may provide a series of research questions to get them started. I had originally avoided this because I felt it was too constricting – part of the excitement of conducting research is to pick a topic you truly love, and explore it in directions that no one else has in the past. The problem I believe stems from the loss in autonomy we are witnessing in students. They are daunted by the "unknown", and are fearful of the consequences of failure. So I will try to reach a middle-ground, by providing broad research topics, and encourage them to focus from there.

- e) What would you change? 1) Do you intend to run this project again, and if so, will there be 2) changes to the course and/or 3) changes to the project based on your experience running it?

Yes, I wish to run the exercise again, and through your funding, I will be able to have a dedicated TA. Given that the rubrics are now in place, more of the TA time will be designated for one-on-one interactions with students, and greater feedback through marking. I would also host an interactive

project-selection lab, maybe with the help of other paleontology/geology faculty members who could help with the brainstorming. I would also scaffold the project more: this year, I ran a similar model for my utm290 course, with small weekly assignments including 1) designing a testable hypothesis, 2) specific methods to test hypothesis, 3) expected results