



UPER Project – Final Report

Report Completion Date: (2023/11/08)

1. PROJECT OVERVIEW

1.1 General Information

Faculty/Department:	Science/Botany and Zoology		
Degree Program:	Biology (BSc)		
Project Title:	Defining and mapping program learning outcomes for the Biology curriculum: empowering students and faculty in the development of core knowledge and competencies		
Principal Investigator/ Department Head:	Dr. Sunita Chowrira, Professor of Teaching, Associate Head of the Biology Program, Botany, Faculty of Science		
Other Applicants:	Dr. Patricia Schulte, Professor, Zoology, Faculty of Science Angie O’Neill, Associate Professor of Teaching, Zoology, Faculty of Science Erica Jeffery, Science Education Specialist (SES), Zoology, Skylight, Faculty of Science Dr. Christine Goedhart, Science Education Specialist (SES), Botany, Skylight, Faculty of Science		
Report Submitted By:	Erica Jeffery		
Project Initiation Date:	April 1, 2019	Project Completion Date:	March 31, 2022

2. GOALS, UNANTICIPATED OUTCOMES and NEXT STEPS

2.1 Goals – *With reference to the goals you originally identified in your project proposal, please list the goals of this project that were met, partially met, not met or removed. If not met or removed, please briefly mention the reason(s) for this. Please feel free to use a format other than the table provided.*

	Goal	Met	Partially met	Not met or removed	Reason (if “not met or removed”)
1	Work with faculty, students, and alumni to reach a consensus on Program Learning Outcomes (PLOs) for Biology program graduates		Yes		Note: Based on consultation with faculty, students, and alumni, we have a complete final draft of PLOs for Biology program graduates. Faculty have contributed directly to the current draft (as part of a faculty retreat), but we still need to reach a consensus on the final



					list of PLOs across both departments via votes at faculty department meetings.
2	Map PLOs, pre-requisite knowledge, and course activities related to transferable skills across the curriculum, and assess the learning achievements of students	Yes			
3	Evaluate areas in which curriculum and student learning are well-aligned with PLOs, and identify opportunities for improvement	Yes			
4	Communicate to students and faculty the connections between course- and program-level PLOs, and highlight opportunities for students to build upon skills across the curriculum		Yes		Note: Project deliverables have been clearly communicated to faculty via the project website (https://bioskillsproject.wordpress.com/), as well as multiple presentations at faculty meetings, retreats, and seminars. We still need to develop resources that effectively communicate resulting insights with our students.

2.2 Unanticipated Outcomes – *If there were outcomes from the project that were not listed in the proposal, please list them here.*

- Our intention in interviewing Biology program alumni was to collect feedback that could be used to inform the development of PLOs. However, after collecting this information, it was clear that students could benefit directly from hearing about the experiences of alumni after graduation. To assist in dissemination this information to undergraduates in our program:
 - We created website to showcase Biology alumni profiles: <https://blogs.ubc.ca/biologyalumni/>
 - We presented our results regarding Biology alumni career paths, as part of our programming for Imagine Day: <https://biologyprogram.sites.olt.ubc.ca/files/2019/09/Imagine-Day-Student-Outcomes-20190927.pdf>



2. Our original motive for collecting information from faculty about course activities was to map the practice and assessment of transferable skills across the curriculum. However, we realized that faculty might also benefit from knowing more about effective activities that were being used in other courses.
 - To assist in the sharing of pedagogical practices across courses, we developed a Canvas site (Biology Program Teaching and Learning Activities Repository) where faculty can browse a list of activities by course or by activity type, and add activities and supporting info to their own Wiki-style course pages.

2.3 Next Steps – *The goal of UPER was to support units in planning to reframe “undergraduate academic program design in terms of learning outcomes and competencies”. Please indicate how you will implement the plans you developed along with any goals to share or extend the work done in your UPER project.*

- 1. Increase alignment across the Biology curriculum:**
 - Work with the Biology Curriculum Committee to develop plans to address issues that have been identified by PLO mapping
 - Streamline and re-adjust our upper-level course offerings to better align with our core courses
 - Reduce or eliminate complex pre-requisite structures that are not absolutely required
- 2. Increase alignment of course learning outcomes with program learning outcomes:**
 - Begin working with specific courses (identified through this project) in order to implement changes in course content and activities that support achievement of identified PLOs
 - Develop “teaching toolkits” that identify relevant best practices and resources, to assist faculty who are interested in addressing key skills and/or content in their courses. Highlight effective course activities faculty are already using (including those in the Canvas activities repository).
- 3. Encourage ongoing collaboration and communication among instructors:**
 - Develop communities of practice that connect faculty who teach related courses (e.g., connect upper-level courses with their lower-level pre-requisites; connect courses that address related skills and/or content).
- 4. Empower students to achieve their academic goals**
 - Develop advising documents to help students navigate through our program and build the transferable skills that will be most valuable to them upon graduation

2.4 Future Support – *How might the CTLT or other support units help you achieve your next steps? If you are unsure, please consult with the CTLT staff member who worked with you on this project.*

Some of our future goals could be realized through the development of online resources or interactive



tools (e.g., online “teaching toolkits”; core Canvas modules that are used by multiple courses; online tool that helps students to navigate our program). We would need additional support, including support from CTLT, in order to develop such resources.

3. IMPACT

3.1 Predicting and Confirming the Impact of the Project – Considering the achievements to date and your expected next steps, please describe:

- Who will your UPER project impact? (e.g. students, instructors, TAs or community members) If possible, quantify the size and scope of the impact (e.g. number of students who will be impacted).
- How will they be impacted? (e.g. improved graduate outcomes, increased employability, etc.)
- What plans do you have for confirming, measuring or evaluating impact?

Predicted Impacts		
Who (include size/scope)	How	Plan for confirming, measuring or evaluating
Program	<p>This project has identified multiple opportunities for increasing student opportunities to develop transferable skills, and improving the alignment of the Biology curriculum with PLOs that are valued by students, faculty, and alumni.</p> <p>Additionally, the PLOs we have developed can now provide a standard against which we can assess student achievement of intended outcomes, and will serve as a guide for future decision making regarding our curriculum.</p>	
Students	<p>Our project’s primary aim was to positively impact students by aligning the Biology curriculum with PLOs that emphasize the development of key transferable skills. Students will benefit directly from increased opportunities to develop these important skills.</p> <p>Providing students with clearly articulated PLOs and accompanying advising</p>	<p>We plan to re-deploy the student survey on transferable skills that we developed and ran as part of this project; this survey asked students about their level of practice and confidence with key transferable skills, as well as which courses in the Biology program were particularly useful for developing those skills.</p> <p>As part of developing and evaluating future advising documents, we hope to run focus groups with students asking them about</p>



	documents will also make it easier for students to navigate the program, and empower students to set and work towards their own goals upon graduation. By highlighting the ways in which individual courses help them to build upon transferable skills, these resources will enable students to better identify and articulate what transferable skills and knowledge they are gaining from their degree, and how this supports them in the next steps after graduation.	their experiences navigating the program, and whether they find the PLOs relevant and applicable.
Instructors	By sharing the insights we've gained through this project with faculty, we hope we have improved their understanding of their role in developing students' transferable skills, both in their individual courses and in the context of the program as a whole. Having a set of faculty-endorsed PLOs will also hopefully increase faculty buy-in for future program renewal.	We plan to revisit the issues raised through this project (including opportunities for increase alignment with PLOs) at our upcoming Biology Teaching and Learning Retreat, and will seek feedback and input from faculty regarding next steps.

3.2 Dissemination – Please provide a list of any past or upcoming activities (e.g. presentations, publications, etc.) through which you or anyone from your team have shared or expect to share information regarding this project.

Presentations:

- Schulte, T. (2022). *Biology Undergraduate Program UPER: Undergraduate Program Evaluation and Renewal* [Presentation]. Zoology Faculty Retreat. May 3, 2022.
- Schulte, T. (2021). *Biology UPER Project Update* [Presentation]. Zoology Faculty Meeting. December 9, 2021.
- Schulte, T. (2021). *Biology UPER Project Update* [Presentation]. Botany Faculty Meeting. December 2, 2021.
- Meents, M., & Schulte, T. (2020). *A Foundation for Change: Skills and Content Coverage in UBC Biology Courses* [Presentation]. UPER Update at Departmental Seminar. September 24, 2020. <https://bioskillsproject.files.wordpress.com/2020/09/uper-update-seminar-20200924.pdf>



- Meents, M. (2019). *What do alumni do after graduation?* [Presentation]. Imagine Day. September 2019. <https://biologyprogram.sites.olt.ubc.ca/files/2019/09/Imagine-Day-Student-Outcomes-20190927.pdf>

Posters:

- Garzke, J., Meents, M., Jeffery, E., Steinwand, B., O'Neill, A., Dee, J., Fast, N., Donnelly, C., Chowrira, S., & Schulte, P. (2022). Developing Transferable Skills: Program-Level Learning Outcomes for Biology Undergraduate Students. *TLEF Showcase, 2022*. <https://tlef2.sites.olt.ubc.ca/files/2022/05/2022-SCI-Sunita-Chowrira.pdf>
- Garzke, J., Meents, M., Jeffery, E., Steinwand, B., O'Neill, A., Dee, J., Chowrira, S., & Schulte, P. (2021). Which skills are important for Biology majors. *TLEF Showcase, 2021*. <https://tlef2.sites.olt.ubc.ca/files/2021/05/2021-TLEF-Showcase-SCI-Sunita-Chowrira.jpg>

Website:

- UBC Biology Program. (2019). UBC Biology Alumni. <https://blogs.ubc.ca/biologyalumni/>

Reports:

- *Report on UBC Biology Alumni 2020 Survey (Apr. 2020)*: <https://bioskillsproject.files.wordpress.com/2020/04/2020-ubc-biology-alumni-report.pdf>
- *Summary of Biology Content Focus Groups (Aug. 2020)*: <https://bioskillsproject.files.wordpress.com/2020/08/content-focus-group-report-20200812.pdf>
- *Skills Coverage in UBC Biology Courses (Sept. 2020)*: <https://bioskillsproject.files.wordpress.com/2020/09/biology-skill-report-20200916.pdf>

4. REFLECTION:

What do you know now that you wish you knew before embarking upon your UPER project? What recommendations would you have for any future programs starting their own program renewal? The information you share will help us design better support resources and guidelines for future applicants.

- **Hire effective team support:** Throughout our three-year project, we had multiple team members go on leave, and everyone encountered unexpected changes in their workload due to disruptions caused by the COVID-19 pandemic. However, by hiring proficient Teaching and Learning Coordinators we were able to maintain project momentum.
- **Be strategic about stakeholder engagement:** Initially, we felt we should be consulting with all interested parties in developing PLOs. However, as we progressed through the project we realized that, not only was it okay to focus on certain stakeholders, it actually made more sense in light of our project goals. As with all data collection, it's worthwhile considering how you will act upon the information you collect before collecting it. We realized there were certain



stakeholders (e.g., employers) whose interests we were not going to put above those of our faculty and students, so it didn't make sense to consult with them.

- **Be strategic about data collection:** We initially planned to collect data regarding skills coverage in individual courses by gathering information from course Canvas sites. However, this proved to be too time intensive, and not targeted enough for our purposes. Instead, we ended up using a preliminary online survey, followed by in-person interviews with instructors to gather data on skills coverage in individual courses. Similarly, we used in-person discussions with faculty (in the form of focus groups) to identify areas of content deficit in the curriculum. These one-on-one and group conversations were more effective and focused, and had the additional benefit of engaging faculty more actively in the project.
- **Embrace opportunities for unforeseen benefits:** Capitalize on unanticipated positive outcomes that are easily attainable (i.e., low hanging fruit). While some initial project goals might prove to be overly ambitious, there could be valuable side outputs that would not have otherwise materialized.
- **Adopt a long-term perspective:** Even if you know going in that curriculum revision is a time-consuming process, the pace can still at times be daunting. Try to trust the process. Anticipate that some faculty may not immediately be ready to embrace and act upon your project outputs. If what you are doing is truly relevant, more and more will start asking the right questions, though, and when they do, the time put in collecting data and writing reports means you'll have answers for them.