



TLEF Project – Final Report

Report Completion Date: (2018/08/31)

1. PROJECT OVERVIEW

1.1. General Information

Project Title:	SoilWeb200: Open Resource for Authentic Student Learning		
Principal Investigator:	Maja Krzic		
Report Submitted By:	Maja Krzic		
Project Initiation Date:	Apr 1, 2017	Project Completion Date:	Aug 31, 2018
Project Type:	<input type="checkbox"/> Large Transformation <input checked="" type="checkbox"/> Small Innovation <input type="checkbox"/> Flexible Learning <input type="checkbox"/> Other (please specify):		

1.2. Project Focus Areas – Please select all the areas that describe your project.

- Resource development (e.g. learning materials, media)
- Infrastructure development (e.g. management tools, repositories, learning spaces)
- Pedagogies for student learning and/or engagement (e.g. active learning)
- Innovative assessments (e.g. two-stage exams, student peer-assessment)
- Teaching roles and training (e.g. teaching practice development, TA roles, learning communities)
- Curriculum (e.g. program development/implementation)
- Student experience outside the classroom (e.g. wellbeing, social inclusion)
- Experiential and work-integrated learning (e.g. co-op, community service learning)
- Indigenous-focused curricula and ways of knowing
- Diversity and inclusion in teaching and learning contexts
- Open educational resources
- Other (please specify):



1.3. Project Summary

SoilWeb200 (<http://soilweb200.landfood.ubc.ca/>) is an innovative, open access educational resource supporting student learning in 16 UBC courses and 17 courses at universities across the world. It was first developed in 2003 for UBC's APBI 200 - Introduction to Soil Science course and has undergone several adaptations to keep it current with the latest platforms and responsive technologies. Although use of SoilWeb200 is strong and still growing, we are now at a time where student-generated content can enhance educational resources and more keenly engage students in their learning of a subject. The objective of this project was to enhance use of the SoilWeb200 by embedding open pedagogies (e.g., student-generated Newsfeeds, Wikipedia-based activities) that allow authentic knowledge creation and encourage students to connect course content with real-world applications. This approach enhanced student understanding of the important roles of soil in global issues such as food security, climate change, biodiversity, air and water pollution.

1.4. Team Members – Please fill in the following table and include students, undergraduate and/or graduate, who participated in your project.

Name	Title/Affiliation	Responsibilities/Roles
Julie Wilson	Lecturer	Content development

1.5. Courses Reached – Please fill in the following table with past, current, and future courses and sections (e.g. HIST 101, 002, 2017/2018, Sep) that have been/will be reached by your project, including courses not included in your original proposal (you may adapt this section to the context of your project as necessary).

Course	Section	Academic Year	Term (Summer/Fall/Winter)
APBI 200	001, 002 & DE	2017-18	Term 2 & Summer (May)
APBI 260	001	2018-19	Term 1
FRST 201	001	2018-19	Term 1
APBI 100	001	2018-19	Term 1
APBI 361	001	2018-19	Term 2
APBI 401 / SOIL 501	001	2018-19	Term 1
APBI 402 / SOIL 502	001	2018-19	Term 2
APBI 403 / SOIL 503	001	2018-19	Term 1
EESC 456	001	2018-19	Term 1
GEOB 103	001	2018-19	Term 1



2. OUTPUTS AND/OR PRODUCTS

2.1. Please list project outputs and/or products (e.g. resources, infrastructure, new courses/programs). Indicate the current location of such products and provide a URL if applicable.

Product(s)/Achievement(s):	Location:
Bonus assignments	https://wiki.ubc.ca/Course:APBI200/Bonus_Assignments

2.2. Item(s) Not Met – Please list intended project outputs and/or products that were not attained and the reason(s) for this.

Item(s) Not Met:	Reason:
N/A	

3. PROJECT IMPACT

3.1. Project Impact Areas – Please select all the areas where your project made an impact.

- Student learning and knowledge
- Student engagement and attitudes
- Instructional team teaching practice and satisfaction
- Student wellbeing, social inclusion
- Awareness and capacity around strategic areas (indigenous, equity and diversity)
- Unit operations and processes
- Other _____

3.2. What were you hoping to change or where were you hoping to see an impact with this project? – Please describe the intended benefits of the project for students, TAs, instructors and/or community members.

By creating the technical infrastructure for students to post relevant articles about soil and its importance in a variety of global issues such as biodiversity, food security, ecosystem services, eradicating poverty, climate change and water availability, in addition to production of food, fiber and energy, we provide engaging learning opportunities for UBC students.

Short-term benefits to students:

- 1) Support and enhance students’ comprehension of material covered in APBI 200 course
- 2) Integrating online, open-access educational tools such as SoilWeb200 with Wikipedia provided avenues for direct student engagement with the course material.



Sustainable benefits to students:

1) Engagement with authentic knowledge creation as student-generated content posted in the SoilWeb200 also repurposed a number of other, similar soil science educational resources, including linking of the student-generated news feeds to the VSSLR's Soil 4 Youth resource, which is targeted to high school teachers and students (<http://soil4youth.soilweb.ca/soil-in-the-news/>); hence, APBI 200 students' work will also contribute to the learning of high school students.

3.3. Were these changes/impacts achieved? How do you know they occurred? – *What evaluation strategies were used? How was data collected and analyzed? You are encouraged to include copies of data collection tools (e.g. surveys and interview protocols) as well as graphical representations of data and/or scenarios or quotes to represent and illustrate key themes.*

Evaluation was according quality check-list (shown below) based on eCampus Alberta & UBC's quality rubrics.

Writing

- √ The level of language used is appropriate for the intended audience.
- √ The writing is free of bias relative to age, culture or ethnicity, gender, and sexual preference.

Technical Standards

- √ The learning resource multimedia has been optimized for size and use with standard computer systems.
- √ Multimedia elements do not exceed minimum hardware/software requirements.

Layout (Visual Design) Standards

- √ The content in a clear, concise, easy to navigate.
- √ A simple, consistent, and accessible structure for navigation is provided.
- √ Learning resource provides learners the opportunity to proceed at their own pace.

Instructional Design and Pedagogy Standards

- √ The learning resource is academically rigorous, relevant, current and has open access.
- √ A variety of instructional strategies are used to ensure compatibility with learners' learning styles.
- √ The learning resource meets universal design principles.
- √ Information presented in the learning resource is accurate.
- √ Content is presented in a logical sequence based on the learning objectives.

Assessment Standards

- √ Content activates prior knowledge of the learner.
- √ The learning resource provides opportunities for practice and transfer of learning in a variety of ways.
- √ The learning resource provides background information required by the learner for successful understanding of the material covered.



3.4. Dissemination – Please provide a list of **past** and **upcoming** scholarly activities (e.g. publications, presentations, invited talks, etc.) in which you or anyone from your team have shared information regarding this project.

Several dissemination activities (i.e., 11 presentations at national and international conferences and 1 peer-reviewed scientific paper) have been carried out to inform the community of learning about this educational resource.

1. Brevik, E., Hannam, J., Field, D., Krzic, M. and Banerjee, M. 2018. What do the undergraduate degrees students earn to pursue careers in soil science say about the place of soil science in different countries? Proceedings of the 21st World Congress of Soil Science, Aug 12-17, 2018, Rio de Janeiro, Brazil.
2. Brevik, E., Hannam, J., Field, D., and Krzic, M. 2018. What Undergraduate Degrees are Students Earning to Pursue Careers in Soil Science? Proceedings of the 2018 Annual Conference of the European Geoscientists Union. Apr 8-13, 2018, Vienna, Austria.
3. Krzic, M., Yates, T., Basiliko, N., Pare, M.C., Diochon, A., and Swallow. 2018. Introductory Soils Courses: A Frontier of Soil Science Education in Canada. Proceedings of the Annual Conference of the Canadian Society of Soil Science. Jun 10-14, 2018. Niagara Falls, ON.
4. Krzic, M., J. Wilson, N. Rogic, W. Engle and S. Dyanatkar. 2018. SoilWeb200 and Wikipedia: Leveraging Open Resources for Active Student Learning and Soil Science Knowledge Dissemination. UBC Open Learning. May 3, 2018.
5. Krzic, M., J. Wilson, N. Rogic, W. Engle and S. Dyanatkar. 2017. Leveraging Open Resources for Authentic Student Learning and Soil Science Knowledge Dissemination in a Wikipedia Edit-a-Thon. Proceedings of the 2017 Annual Conference of the Soil Science Society of America. Oct 22-25, 2017. Tampa, FL.
6. Krzic, M., J. Wilson, N. Rogic, W. Engle and S. Dyanatkar. 2017. SoilWeb200 and Wikipedia: Leveraging Open Resources for Active Student Learning and Soil Science Knowledge Dissemination. Proceedings of the 2017 Annual Conference of the Soil Science Society of America. Oct 22-25, 2017. Tampa, FL.
7. Amerongen Maddison, J., Krzic, M., Simard, S., Adderly, C. and Khan, S. 2017. Shroomroot: a digital game designed to enhance postsecondary learning about mycorrhizae. Proceedings of the 2017 Annual Conference of the Soil Science Society of America. Oct 22-25, 2017. Tampa, FL
8. Krzic, M., J. Wilson, N. Rogic, and W. Engle. 2017. SoilWeb200 and Wikipedia: Leveraging Open Resources for Authentic Student Learning and Soil Science Knowledge Dissemination. Proceedings of the Annual Conference of the Canadian Society of Soil Science. Jun 10-14, 2017. Peterborough, ON.
9. Amerongen Maddison, J., Krzic, M., Simard, S., Adderly, C. and Khan, S. 2017. Development and evaluation of Shroomroot: an plant-ecology-focused digital game designed to enhance postsecondary learning about mycorrhizae. Proceedings of the Annual Conference of the Canadian Society of Soil Science. ON. Jun 10-14, 2017. Peterborough, ON.
10. Krzic, M. 2017. Wikipedia Edit-a-thon for World Soil Day. Center for Teaching, Learning and Technology, Vancouver. Dec 5, 2017. (https://en.wikipedia.org/wiki/Wikipedia:Meetup/World_Soil_Day_2017_Edit-a-thon)
11. Krzic, M., M. Iverson, S. Dyanatkar, and N. Sidles. 2017. Science Citizenship in postsecondary curriculum. UBC Open Learning. May 2, 2017.

In addition, this educational resource was also featured in this peer-reviewed paper:

1. Krzic, M., T. Yates, A. Diochon, M. Swallow, N. Basiliko, and M. Pare. 2018. Introductory soils courses: a frontier of soil science education in Canada. Canadian Journal of Soil Science 98:343-356. <https://doi.org/10.1139/cjss-2018-0006>.



4. TEACHING PRACTICES – Please indicate if **your** teaching practices or those of **others** have changed as a result of your project. If so, in what ways? Do you see these changes as sustainable over time? Why or why not?

The overall goal of this project was to enhance student engagement with course materials and their comprehension of a complex subject that builds on the basic principles of chemistry, physics, and biology. This project is part of an ongoing national initiative on innovations of the soil science curriculum, instigated in 2004 with the establishment of the Virtual Soil Science Learning Resources (VSSLR) group (www.soilweb.ca) under Dr. Maja Krzic's leadership. This program has become a focal point for collaborative teaching efforts among scientists, students, and multimedia experts from 11 universities and 4 research institutes across Canada resulting in the development of 20 web-based open access educational tools, 2 online courses, 1 multi-institutional soil classification field course, 1 cross-disciplinary graduate training program, and 17 national and international educational awards.

The whole teaching team of the APBI 200 – Introduction to Soil Science course, which included 2 instructors and 7 Teaching Assistants (TAs), had an opportunity to observe students' engagement with the bonus assignments that were developed during this project. It was particularly refreshing to observe students' engagement with news gathering and especially with development of the soil-related memes, which often had humorous content. At the end of the course, TAs voted for the best 3 memes and students who created them were presented with awards in the class. All of this, brought a fun approach to teaching and learning, something that we will definitely continue in the future.

5. PROJECT SUSTAINMENT – Please describe the sustainment strategy for the project components. How will this be sustained and potentially expanded (e.g. over the next five years). What challenges do you foresee for achieving the expected long-term impacts listed above?

We hope that our ongoing dissemination efforts may spawn similar teaching and learning initiatives, leading to an even greater number of students who would benefit from this project in the long term. In 2014, Dr. Maja Krzic initiated Soil Science Education Committee within the Canadian Society of Soil Science (see <http://csss.ca/education-committee/>), which is one of very few such committees in the world. That committee and Canadian Society of Soil Science conference sessions that our team organized in 2017 and 2018 (and is planning to organize in 2019), provided platforms for sharing our findings and will further solidify our team and UBC as leaders in innovations in soil science education.