Technology-Enabled Learning

# Technology-Enabled Learning

A Casebook of Exemplars

eCampusOntario

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# Contents

# Introduction

Through the years, Ontario post-secondary institutions have built some impactful technology-enhanced learning resources. This casebook will highlight some of these educational experiences from colleagues across the post-secondary landscape in order to inspire continued creation of high-quality, digital resources for learners in the province.

All these cases are open in nature, making them available to all without the need of a login or an account. This is the first version of a casebook; we are hopeful to expand its content.

You are all invited to read, get inspired, and also contribute in the future!

# Course Exemplars

# Open Planets: Sharing the Solar System



*Jovian Cloud Tops* courtesy of NASA/JPL-Caltech -Bjorn Jonsson

**Why We Set Out**

Like many educators, we were struggling to find a current, relevant survey textbook, in this case for our online Planetary Science course. We didn't feel that there was a comprehensive, up to date publication that met all of our needs, so we embarked on building our own. With support from the Brock University Centre for Pedagogical Innovation (CPI), who sought new eLearning projects, we began a one-year journey to research and develop a resource that would serve our learning outcomes and could be shared with other interested educators and learners. We landed with a textbook made up of five modules that we co-wrote, edited, and gathered into a single resource page for our learners. You can view our final work at the following website Brock University ERSC 1P94 Planetary Science.

We combined our resource with other course elements such as discussion and assessment for a fully online delivery with Brock undergraduate students and have delivered the course twice in partnership with 450 learners.

**How We Accomplished Our Mission**

In order to complete our resources we had to invest a lot of trust in each other and a lot of up-front time in writing and development. We each worked on modules and segments and provided each other with feedback along the way. Brock University's Centre for Pedagogical Innovation, led by Director Jill Grose shared their outstanding team that certainly knew what they were doing. They were all a real pleasure to work with. The Instructional Designer, Giulia Forsythe, and Manager of eLearning, Matt Clare, provided us with support to use the Scalar open sources publishing platform to build and share our final product.

Using Scalar, we were able to do all of the writing and multimedia work ourselves. This was empowering and aligned well with our development style. The platform was very easy to use. Some nice features were the: professional look and feel; ease of use for adding images and videos; accessibility tools as part of inclusive design (universal design for learning); and ease with which we could update our materials each delivery.

Two additional benefits were the free textbook aspect for our students and the ability to share this resource with others – openly. We definitely welcome any educator who wants to use, adapt, and contribute to the resource.

**Key Elements for Our Success**

- Use of Scalar as the writing and development tool
- Support from our institution and the Centre for Pedagogical Innovation Any quick details on institution support – CPI mentioned above, but nothing about institution?
- Our commitment to developing a resource that we could manipulate and ensure would be as up-to-date and engaging as possible

# Stress Relief Through Badging



Source: Pixabay.com Public Domain

**Why I Chose Badges**

Using badges as part of my learners' final preparation course for their Registered Massage Therapist exams turned out to be a method of stress reduction for them and for me.

My name is Iain Robertson and I'm a Professor in the Massage Therapy program. I've been a practitioner and an educator for many years and currently teach a wide variety of courses as part of our programs. One of my courses, Practical Consolidation is a final preparation course for graduating students that are about to take their written and practical exams as part of their professional accreditation process. This can be a stressful time for students as there is a lot riding on the exams (financially and psychologically).

In the past I had developed fairly traditional methods of test prep involving multiple mock written exams as practice, using feedback on the subjective elements of skill demonstration and patient interaction. These approaches did not put students at ease or boost their confidence as effectively as I'd hoped. I sought an alternative approach that might provide opportunities for learners to self-regulate practice on quiz items and explore the diversity of practice decisions with peers in a safe environment. I landed on the use of badges as one way

to gamify these tasks and increase engagement. My approach brought a focus on formative, practical work that required significant perseverance and creativity.

Level-one badges in the course were grounded in weekly readings and multiple-attempt quizzes that learners could take as many times as needed to achieve 100%. Learners were also invited to ask their peers for help if they were stuck on a particular question.

Level-two badges were tied to weekly 3-hour lab activities – physical hands on practice and discussion related to the planning and technique elements of massage therapy practice.

Level-three badges were used in a variety of ways that required learners to reflect and synthesize their program knowledge in the form of quiz questions and practice scenarios for everyone to use. They also engaged in role-play and open-ended questioning that simulated what they might experience as part of their observational exams. Learners could make mistakes, explore how their responses might be grounded more effectively in the science of their profession, and refine their skills until they felt 100% confident in their ability to complete their real-world testing.

**How I Built and Awarded Badges**

There were a variety of badging systems available outside of institutional learning management systems to choose from. I chose to use Passport, a system developed at Purdue University that was free to use at the time I began my badging practice. It is now a paid service, but there are many options in the badging world. With a good user interface, I found badges were relatively simple to design and easy to manage in terms of adding learners and tracking their progress through my learning management system. Some new and open options that you might try are listed below. My badging strategy has resulted in a significant positive difference in the success of my learners in their professional exams and I will continue to consider ways that I can improve my use of this tool and pedagogic strategy to build learner confidence.

**Badging Systems You Can Test**

Some badging systems that you might explore for your courses:
  Open Badge Passport
  Badgr
  Badgr Help Page on YouTube



Email: iain.robertson@georgiancollege.ca

# Bioweb: Une journée dans la vie de Bobio!



Source: Unsplash.com Public Domain

   URL: http://fad.lacitec.on.ca/public/bobio/

   Contributors: Liane Leclair, Professor, Collège La Cité and Suzanne Cormier, Professor, Collège La Cité

   Blurb : Bioweb uses storytelling and a cartoon character to engage learners in an online module on human anatomy. This fresh, new look on this subject matter has delivered some impactful results in terms of learning gains and in the success of many learners on their journey in health programs at La Cite.

Storytelling

We wanted to engage learners to go through basic biology content in preparation for Health programs. This part of the curriculum is essential to success and is often times the main roadblock for learners in their journey. We knew that a dry, traditional presentation of the concepts would not have the wanted impact, we surveyed stakeholders and understood from the data that  we needed to use a new approach.

With the help of a digital storyteller, we decided to built the modules and topics through the lens of a comic book character.

This character is based on a 20 year old boy (Bobio) who is intrigued by what is happening to his body. The navigation of the modules is aligned to the inquiry of the character and give the topics a lighter more entertaining twist. The modules are created in an interactive manner where some concepts are presented with images and activities and questions are asked at various times in order to offer a dynamic experience to the learners.

Agile Approach

The first version of Bioweb was launched in 2014 and had some immediate impact. All students taking class "16074 – Biologie" at College La Cite were pointed to the resource and got to used the modules to reinforce the topics covered. After getting feedback from the users (educators and learners), we added three additional modules and also built a pre-test and a post-test. These added parts gives the opportunity for learners to test their knowledge before and after taking the modules. After each school year, we collect data for learners to improve the module and to insure it answered their needs. The module is built on easy to modify technology which makes updated it very straightforward and simple.

External Impact

The modules have been very popular with outside users as well. Since they are built as an open resource and are accessible from anywhere, they have been consulted by many external parties. A number of French speaking high schools have picked up Bioweb as an additional resource to their curriculum. This has provided for the added benefit of exposing College La Cite's work to many prospective learners. An English version might be coming soon!

# OrgChem101: Learning lab



Source: OrgChem101.com

URL: http://www.orgchem101.com

Contributor: Alison Flynn, Associate Professor, University of Ottawa

Blurb: OrgChem101 uses mastery-based learning to help students consolidate important foundational pieces of content in chemistry. The module pinpoints areas of study and offers theoretical and practical activities to learners in order to help them succeed.

**Control to the Learner**

We wanted to offer learners the opportunity to get a good grasp of the theory behind some foundational pieces of organic chemistry. One of the main topics that is difficult to learn is Organic Chemistry nomenclature. Through some funding and a lot of hard work, we were able to launch OrgChem101 in 2012. The idea is to give the learner control of his learning path by offering him to choose categories and sections of the modules. This then triggers a test that will seek to assess the learners strengths and weakness. After this exercice, the learner can choose which path he prefers and go on to the various activities.

**Technology Unique**

OrgChem101 is technology driven by a number of tools and functionalities. Through various partnerships, the modules are able to offer quality content in order to deliver an optimal user experience. The modules are interactive in nature are very different than the usual text-based resources. A lot of practical exercises are part of the work learners have to go through in order to progress in OrgChem101. Of note, OrgChem101 is hosted by the University of Ottawa and has a dedicated programmer that has built the infrastructure that supports the modules. This has enabled us to create a very unique environment that is tailored to our needs. This being said, it's also a bit more tenuous to maintain and to evolve.

**Impact**

To this day, more than 20000 learners have used OrgChem101 as part of their learning journey. The modules is a three part series including nomenclature, mechanisms and acid-based reactions. A research project has been published showing the learning gains from learners in the nomenclature module. Following research projects are expecting to take place for the mechanisms and the acid-based reactions modules.

**Access**

OrgChem101 is built as a bilingual resource facilitating access to French and English learners through the resource. Also, the design of the modules was student inclusive from the start as they were solicited by us to understand how they preferred the resource to be created and how the experience would be engaging to them. OrgChem101 is openly available to all and is used as part of curriculum by some Chemistry courses and the University of Ottawa.

# Leveraging YouTube to Demystify Medicine



Public Domain

Educators: Kjetil Ask, Darren Bridgewater & Renee Labiris, McMaster University

Activities in this 4th year student-initiated cross-disciplinary course are centered on student groups building a video translating medical research into accessible language and made available for all stakeholders via a class YouTube channel.

Website: http://www.demystifyingmedicine.ca/

YouTube Channel: https://www.youtube.com/user/MacDemystMed/feed

A little about the course approach: https://www.youtube.com/watch?v=k7c2rtENU68

**Why We Set Out**

We have been hosting a "Demystifying Medicine' seminar series on a bi-weekly basis since 2012, guided by the groundbreaking DM series out of the National Institutes of Health. These presentations are accredited for continuing medical educaiton units (CME), but are open to anyone and are designed to help increase understanding on how advances in research can make a difference to disease. These are quite popular and well-attended by students, post-docs, researchers and the wider community. We kept hearing from undergraduate students – no matter their disciplinary background – that this translational approach would make for a great course. So that's what we did – we developed an inquiry course in health sciences for all 4$^{th}$ year students at McMaster. Our aim was to use knowledge translation of medical topics as a means to develop soft skills – things like problem-solving, coping with uncertainty, working under pressure and strategic planning and thinking. It is aimed at not only building student skills but also linking educators, clinicians, scientists, patients, students and the general public through the course projects and activities.

**How We Accomplished It**

We used content from the Demystifying Medicine seminar series as well as topics derived from the top 100 questions asked in McMaster's Optimal Aging Portal and questions received from area high school students as the basis for the learner group projects. At the beginning of the term, we divide students into groups of 4 or 5 students. Each group chooses a topic and then creates a knowledge translation video for their fellow students, target audience and the general public – essentially distilling complicated material into an easily-understood video format. Evidence-based research and resources are gathered, appraised and synthesized with patient and stakeholder interviews to form the basis for the storyboarding and scripting process, Students receive feedback from their peers in-class and, through an online 'draft video' website feedback form, their target audience. Groups normally complete 3 to 4 videos per term. Completed videos are posted to the course YouTube channel.

The learners and educators host an end-of-term dissemination event and awards-ceremony, which is attended by their stakeholders. (This year's award winner can be viewed here: https://www.youtube.com/watch?v=v_nyL9ns4Sw

).Overwhelmingly our students say that they love the course, and it always over-subscribed.

**Lessons Learned**

From the get-go, we involved students in the course design – they drafted the first iteration of the course outline in 2013 with us. Since then, every cohort has refined the course outline – coming up with solutions to issues they have identified.

We also partner with health associations – usually those people who are responsible for generating educational materials, and this has worked out well on both fronts. For example, the Scleredoma Association paid hefty fees to develop a video explaining their condition, and the video they received from our students has been viewed as more valuable and has been translated into several languages in their international affiliate associations. Another example was a video our students made explaining how someone with pulmonary fibrosis breathes is widely used by clients at the Lung Association.

During the first few offerings of the course, our learners were given no direction as to what technology to use (e.g., video editing software, animation, etc.). We've since purchased a license for Go Animate, as many students were using this, and there was a request for more technological direction. But we are now find that limiting and regret putting this in place. Students default to this when there may be better ways to convey the information to their stakeholders. Deciding what technology is best for the patient/topic is part of the process, and we are going back to the 'choose your own technology' framework.

**Technologies used:**
Variety of video editing /animation tools:
iMovie
Camtasia
GoAnimate
Powtoon

Prezi
VideoScribe
Animaker
YouTube

# Re-Writing Wikipedia: Students as Producers

With over 7 Billion page views per month, Wikipedia is a go-to for everyone as a source of information. For learners in particular, Wikipedia is a source for their scholarly research. In this position, they are consumers of knowledge. By choosing to teach with Wikipedia, educators can place their learners into positions of producers of knowledge.

| | |
|---|---|
| **Example 1:** *Feminism in Canada* | Alana Cattapan, York University |
| **Example 2:** *Pet Nutrition* | Kate Shoveller, University of Guelph |

**Feminism in Canada**

Why I Set Out

I was looking for a way to connect students' work beyond the classroom. In researching material to support the learning outcomes for the course, I noticed a dearth of details in Wikipedia entries on feminism in Canada. As Wikipedia is among the first entries in the batch of search results, I recognized that students are looking at this, so how could we collaboratively address this and engage with the world as learners and knowers. At the time, I was myself learning how to be a good Wikipedia citizen – updating and correcting various entries. And I knew that less than 13% of 'wikipedians' were women and this was apparent in much of the mis-and-missing information. The idea of a Wikipedia assignment would help my students recognize that there are gaps in feminist history, that they can contribute to addressing those gaps, and at the same time build succinct, direct and evidenced writing skills.

How I Accomplished It

Designing the assignment was a challenge, as I wanted students to focus on content and collaboration without worrying too much about the technological side of things, and I wanted to be able to assess their individual contributions somehow. I also wanted them to take part in editing one another's work. Eventually, I settled on a model in which students were graded on a short contribution on the topic of their choice, which I compiled, they edited, and I uploaded.

More specifically, students contributed to an existing (or started a new) Wikipedia article on the topic of feminism in Canada or some aspect of the history of the Canadian women's movement. They did not have to contribute to the "Feminism in Canada" article, but they did have to address some aspect of Canadian feminist history, either in an existing article or by developing a new article.

Students indicated that they appreciated the assignment and felt empowered that their work in class was making a difference to the world.

**Pet Nutrition**

**Why I Set Out**

The Wiki Ed Foundation was just forming and I had heard that they were looking for instructors to involve students in writing Wikipedia pages as part of their course assignments. In my 4th year pet nutrition course I have students submit literature reviews and I saw this as an opportunity to share their work with a much wider audience.

How I Accomplished it

I came up with 40 potential topics around pet industry nutrition products and trends. In groups of four or five, students selected a topic and throughout the term, researched and drafted their topic's content for Wikipedia. The Wiki Ed Foundation provided training and support for myself and my students – from the invaluable dashboard which helped track all of the student progress to coming up with the list of potential topics.

The assignment's intent was to have the students think more broadly, improve their research, writing, peer editing and teamwork skills, but I also wanted them to think how their contributions can impact a wider audience. For many pet owners, Wikipedia is a source of information, and the students critically appraised current information and challenged existing viewpoints and provided credible information on 32 different pet nutrition topics that are now accessible to anyone.

My students were surprised at the misinformation they found online, and see now that they can play a critical role in bridging research in their disciplinary area to the general public.

Other Ontario Examples:

- Contemporary Women Playwrights, Dr. Rachel M. Warburton, Lakehead University

- My Name is URL. Writing for the Web, Dr. Christopher Lee, Western University

- Proteins from Birth to Death, Dr. Aarthi Ashok, University of Toronto

- Advanced Topics in Inorganic Chemistry, University of Ontario Institute for Technology

- Exploring Heritage Languages, University of Toronto

**Resources:**

**Wiki Ed Foundation**

Wiki Ed Foundation – Orientation Training for Instructors

The Wiki Education Foundation can help support instructors in their teaching with Wikipedia pursuits through training, support and a course specific dashboard for tracking learner edits.

# Building Community and Connections
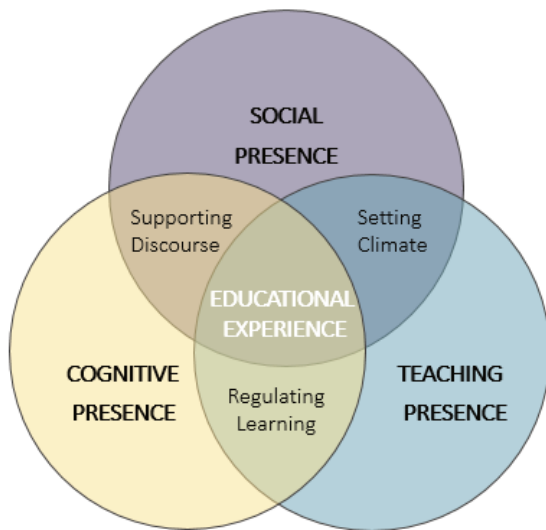


**Dysfunctional "Family" Dynamics**

Human Services Foundation, as a certificate program, markets to learners who require clarification to find their fit under the large umbrella of programs in human services.

We, the faculty, desiring more flexibility for our learners and to avoid consistent scheduling during those evil hours (e.g., 8 a.m. Mondays) moved select courses online. *Individual and Family Relationships* was one. While improving learners' schedules, we also needed to boost their engagement with the content, peers, and ourselves.

Feel free to visit our re-designed course or contact Marco Felvus, Program Coordinator for more information.

**Strengthening "Family" Bonds**

Learners can plan their time more effectively and connect with each module's content more easily through the detailed agenda at the start and the comprehensive checklist, detailing required tasks, at the end. We encourage our learners to stay connected to the content through its multiple paths of access. Exploring and interacting with core concepts through articles, videos, and audio complement learners' preferences and provide options for different learning situations.

Our built-in flexibility continues through assessment. Learners choose from a variety of options. We extend variety beyond due dates to include different ways to demonstrate learning outcomes. Exploring "Issues Affecting the Family" is done by: participation in a structured, online debate on guaranteed income; performance of a pitch to potential patrons to support anti-family violence initiatives; a critical analysis of mass media's portrayal of mental illness; a PSA design challenge for substance abuse; and by building an annotated bibliography to deal with chronic illness in the family.

We also increase our chances that learners connect with resources, by using free (and often open) tools to build our course over costly textbooks or courseware. Injecting games built from free builders triggers interest in the module's content.

Moving online meant our promotion of peer-to-peer communication had to be more planned and intentional. Requiring discussion posts and responses before moving forward in the content forced connection, while other course material was crowd-sourced and extended by learner contributions. "Get help; Give help" discussion topics with options to post anonymously furthered peer-to-peer learning and links.

Using the Community of Inquiry framework as a guide allowed us to check and ensure there are opportunities for all course connections – learner to content, learner to learner, and learner to us.

**Growing the "Family"**

Just as it takes a village to raise a child, it takes an entire Centre for Teaching and Learning to raise a course (to the level we wanted for our learners). Tight timelines and vacation schedules forced a different type of collaboration for this project. As the Instructor and Subject Matter Expert, I provided the content learners would explore and ideas for assessment. A Curriculum Development Specialist, Instructional Designer, and Librarian developed activities around this core content. Following the Community of Inquiry, they provided triggers to ignite interest in the exploration followed by opportunities to integrate new knowledge through varied assessment, and ending with prompts for meaningful reflection and | or resolution.

This "collaboration in isolation" approach worked well because of the strong ties and trust already existing between Human Services and the Centre for Teaching and Learning; you may want your "family" under one roof for your initial collaborations.

# Ready-to-Use Resources

# Quick Wins From Colleagues Across the Province

The next three examples highlight supplementary resources, developed by your colleagues, that you can use right now to remediate common course hurdles for your learners (and even common course learning outcomes!).

Developed with funding from eCampusOntario, we have chosen aspects of the resources that respond to current challenges, but feel free to explore the resources in their entirety for even greater support.

**WriteOnline**

Three universities, Guelph, Waterloo, and Laurier, collaborated to build a step-by-step resource guiding learners through the most popular genres of academic writing. Whether your course focus is case studies, lab reports, literature reviews, and | or reflective writing, there is material to assist. Each or the four standalone guides showcases the necessary steps to complete a high-quality writing product in any of the genres.

Learners can also access the direct assistance they require through the highly modularized content. They can dip in to refresh their understanding of crucial features or review tips for revising work. Each genre also includes templates to assist with planning and research.



**The Learning Portal**

This collaboration among Ontario college libraries, several of their learning centres, and the Ontario Colleges Library Services (OCLS), "aims to provide easy and equitable access to open learning resources and services to Ontario's online college students and to provide a consistent, province-wide academic support platform for faculty to use for course and assignment design".

Currently, the learning portal addresses five, often confusing, areas at the intersection of technology and education: Study Skills, Research, Writing, Digital Literacies, and Digital Citizenship. Curation by your colleagues guarantees the resources are of the highest quality and target the specific situations of post-secondary learners. Here's a closer look at one of the hubs.

"Digital Citizenship" assists learners' understanding of nine current concerns of today such as, fake news, privacy, and technology's impact on physical and mental health. Through tips, links, videos, self assessments, and quizzes learners grow their understanding of these key topics, learn tips to optimize their opportunities, and become aware of potential pitfalls. Link your learners to the entire hub, one of its nodes, or add the links to your own course content. Boost the impact of these resources by using the "Faculty Toolkit" with its tips and hints on connecting to specific assignments and assessments.



**Foundations of Community Engagement**

Western University's Experiential Learning team combined their expertise with internships and co-ops to establish CompleteStudent.ca, open access co-curricular education. As of Summer 2017, there are three offerings targeting Learning Skills, Community Engagement, and Career Fundamentals. Here, we highlight Community Engagement and its three

modules connecting learners to their communities and considering how those communities might influence their academic learning and personal development. However, you are encouraged to explore how any or all the offerings could support your teaching and learning goals.

Clear learning outcomes for each of the three modules under Community Engagement articulate how you might connect and inject these mini-modules into your course content. In their interactive Storyline format, learners choose scenarios and complete shareable action plans. With embedded assessments and "choose your own adventure" options, learners propose actions and learn the actual repercussions of their chosen paths as they deconstruct power and privilege, and build community partnerships after having laid a foundation of understanding community and its interconnections.

They are designed for reuse by Ontario colleges and universities, who are encouraged to align them to their own co-curricular record activities.