



TLEF Project – Final Report

Report Completion Date: 2019/01/13

1. PROJECT OVERVIEW

1.1. General Information

Project Title:	The Development of Online Oncology Modules, an Oncology App and Virtual Patients to Support Interdisciplinary Oncology Instruction		
Principal Investigator:	Dr. Paris Ann Ingledew		
Report Submitted By:	Dr. Paris-Ann Ingledew		
Project Initiation Date:	April 2013	Project Completion Date:	August 2017
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)
- Curriculum (e.g. program development/implementation, learning communities)
- 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

The majority of practicing physicians will encounter cancer patients yet, many physicians lack training in basic cancer prevention, detection, staging and management. This has been attributed to international deficits in training during medical school. There is a recognized need to develop new teaching resources to support oncology education.

This project has involved the development, implementation and evaluation of novel online teaching resources to support oncology education from an interdisciplinary perspective. The project received TLEF funds in **2013/2014** and **2014/2015**. With the funds we hired two summer students in 2013 (2013/2014 funds), one summer student in 2014 (2014/2015 funds) and three summer students in 2015 (2014/2015 funds extension). As a note, in 2015 we matched our remaining TLEF funds with a Fraser Valley Cancer Centre Research Grant to allow us to extend our funds to hire three students instead of the 1.25 that would have been supported with the remaining TLEF funds. With TLEF funds we also purchased software needed for virtual patient development.

In **2016** we received a final third year of funding for the **2016/2017** TLEF. The money from this TLEF funding round was to help us to respond to our learners and to expand the resource further than our initial proposal, undertake a process to ensure congruence of our objectives and curriculum with new national undergraduate oncology objectives, develop new whiteboard videos and create on the go pdf modules. Due to changes in the medical school curriculum, with an abbreviated 2nd to 3rd year transition, the interested medical students were not able to commit a considerable block of time in 2016. As such they worked as volunteers through the fall of 2016 and spring of 2017 to script new materials, enhance the evaluation components and disseminate the website. We were able to get a TLEF extension and through the spring of 2017 and into early spring 2018 the medical students worked to post the final materials on the website, review and update the current content and finalize the evaluation piece.

The progress of the project can be seen at www.learnoncology.ca.

Our goals for the 2016/2017 funds were to:

- 1. Address remaining cognitive and attitudinal objectives not yet covered by the website**
- 2. Ensure congruence of the web materials with national oncology objectives**
- 3. Respond to evaluation data and enhance identified areas on the website with whiteboard videos**

In 2016, in preparation for the TLEF we returned to curriculum map we developed for the website in 2008 and identified remaining areas of required content development. Additionally, the PI for this TLEF, was part of the “Canadian Oncology Goals and Objectives for Medical Students” national initiative. These objectives were approved by the national oncology organizations (i.e. Canadian Association of Radiation Oncology and Canadian Association of Medical Oncology) and meant to serve as a resource for medical schools in Canada, to guide curriculum development, instruction and assessment. For the 2016/2017 TLEF funding period we wished to address objectives not covered in the 2008 curriculum map and identify areas of content outlined in the national objectives but not yet covered. Finally a considerable amount of evaluation data has been collected over the last few years. Responding to the evaluation data it was clear that a variety of formats for learning (i.e. text based modules, videos, apps) were all complimentary. As such one of our goals was to continue to increase the broad range of resources on the website and expand the whiteboard and app component.



Accomplishments

- a) Between June-October 2016, we mapped the national objectives to the current site content and identified areas for enhancement.
- b) Between September and November 2016, the PI reviewed the website and current gaps with a national group on oncology educators. They helped to review the website with the PI and identified areas for content improvement.
- c) November 2016- Spring 2017 volunteer medical students scripted materials for the following areas
 - a. Cancer Epidemiology and Screening
 - b. Principles of Radiation Therapy
 - c. Management of Spinal Cord Compression
 - d. Management of Brain Metastases
 - e. Management of Superior Vena Cava Obstruction
- d) Spring 2017 scripted materials were reviewed by the PI and national group of oncology educators.
- e) July 2017 to March 2018 Three summer students
 - a. Uploaded and formatted modules (that the students have already written)
 - i. Cancer Epidemiology and Screening
 - ii. Principles of Radiation Therapy
 - iii. Management of Spinal Cord Compression
 - iv. Management of Brain Metastases
 - v. Management of Superior Vena Cava Obstruction
 - b. Designed and uploaded whiteboard videos for:
 - i. The basics of radiation therapy
 - ii. Staging and Grading of Cancer
 - iii. Cancer Basics
 - iv. The 5 W's of lung cancer
 - v. The 5W's of breast cancer
 - vi. The 5W's of prostate cancer
 - vii. Spinal Cord Compression
 - viii. Brain Metastases
 - ix. Superior Vena Cava Obstruction
 - c. Reviewed the current content and update information as needed.
- f) Summer 2017 website was completely revised and ported to a new platform to support sustainability and increased functionality
- g) Development of a YouTube channel
- h) Spring 2018 to present day ongoing evaluation of the website including detailed website traffic and analytic data



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
Lisa Wang	UBC Medical Student	Scripting materials with review by project lead
Tim Wong	UBC Medical Student	Scripting materials with review by project lead
Wynn Tran	UBC Medical Student	Scripting materials with review by project lead
Sarah Yeo	UBC Undergraduate Student Computer Science	Uploading scripted materials and transitioning materials to a new website
Ge Shi	UBC Medical Student	Analysis of web site utilization and evaluation data

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)
MEDD 411	Oncology week	2017, 2018, 2019	Fall
MEDD 431	Radiation Oncology Half day: Surgical and Perioperative Care	2017, 2018, 2019	Ongoing through year
MEDD 448	Oncology and Hematology Section	2019	Winter



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:
Dedicated modules to match Canadian Undergraduate oncology objectives: Modules on <ul style="list-style-type: none"> • Cancer Epidemiology and Screening • Principles of Radiation Therapy • Management of Spinal Cord Compression • Management of Brain Metastases • Management of Superior Vena Cava Obstruction 	www.learnoncology.ca
Whiteboard videos on <ul style="list-style-type: none"> • The basics of radiation therapy • Staging and Grading of Cancer • Cancer Basics • The 5 W's of lung cancer • The 5W's of breast cancer • The 5W's of prostate cancer • Spinal Cord Compression • Brain Metastases • Superior Vena Cava Obstruction 	www.learnoncology.ca
Complete revamp of website and change from wordpress to a sustainable platform	www.learnoncology.ca
Development of a YouTube channel	www.learnoncology.ca

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: [please specify]

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.*

The main goal of this project was to improve the knowledge, attitudes and skills of medical students in an effort to provide competent, compassionate and interdisciplinary care to oncology patients. We hoped that the materials developed for the website would allow learners throughout all medical sites in B.C., to have on demand access to up to date, undergraduate-focused oncology resources. These resources were intended to aid learning through all four years of the medical school. Through piloting of the resources we realized that the resources might be useful for other UBC health care professional students (e.g. pharmacy, social work and nursing) and we were hoping to increase use in these disciplines too. As the website is hosted publicly and the resources are available to students at other institutions throughout the world we hoped that students, residents and a variety of health professionals might use the resource for a review of basic oncology principles.

We hoped there would be indirect benefits to students and faculty. We hoped that the project would provide the opportunity for students and faculty to gain new skill sets in web-design, curriculum development, implementation and evaluation. We also hoped that there would be opportunities for mentoring and coaching in dissemination of scholarship.

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.

The website has been formally integrated into the curricular materials for 1st and 3rd year medical school and will be added to the Transition to Practice (4th year) in 2019. Current metrics show that upwards of 500 unique medical student at UBC (approximately 60% of UBC medical students) use the website annually. By focusing on cancer treatment from an interdisciplinary approach and providing a resource available throughout training, the website will embody the principles of curriculum integration and flexibility integral to curriculum renewal. Evaluation survey data (integrated into the website modules) demonstrates that 90% users are extremely satisfied with the content and feel that it enhances their understanding of oncology. The majority of users from UBC visit the website approximately 2.5 times a month. In 2019 we hope to repeat the initial needs assessment survey done in 2016 to see if there has been a change in oncology education and what additional improvements can be made to www.learnoncology.ca.

We have undertaken an analysis of web traffic to better understand our audience. Since July 21, 2017, the number total unique users on learnoncology.ca: was 7,337 logging a total of 12,268 sessions. We invited users to complete a survey. Between July 21, 2017 to Oct 21, 2018 there were 3,024 survey responses. 2,000/3,023 (66.2%) of survey users were new users, 1,023/3,023 (33.8%) were returning users.



Average of 6.6 survey responses per day.

Table 1: Respondents by Healthcare profession (self-reported)

User Type	Count
Doctor	157
Med Student	1499
Nursing Student	192
Pharmacy Student	71
Radiation Therapy Student	133
Resident (Medical)	303
Other Healthcare Professional	489
Other Student	176
Total	3196

While the vast majority of users are from Canada/North America it is evident that people from all around the world are using the resource. We have become aware that the website is now being used in many medical schools throughout Canada and the United States as a resource in oncology education.

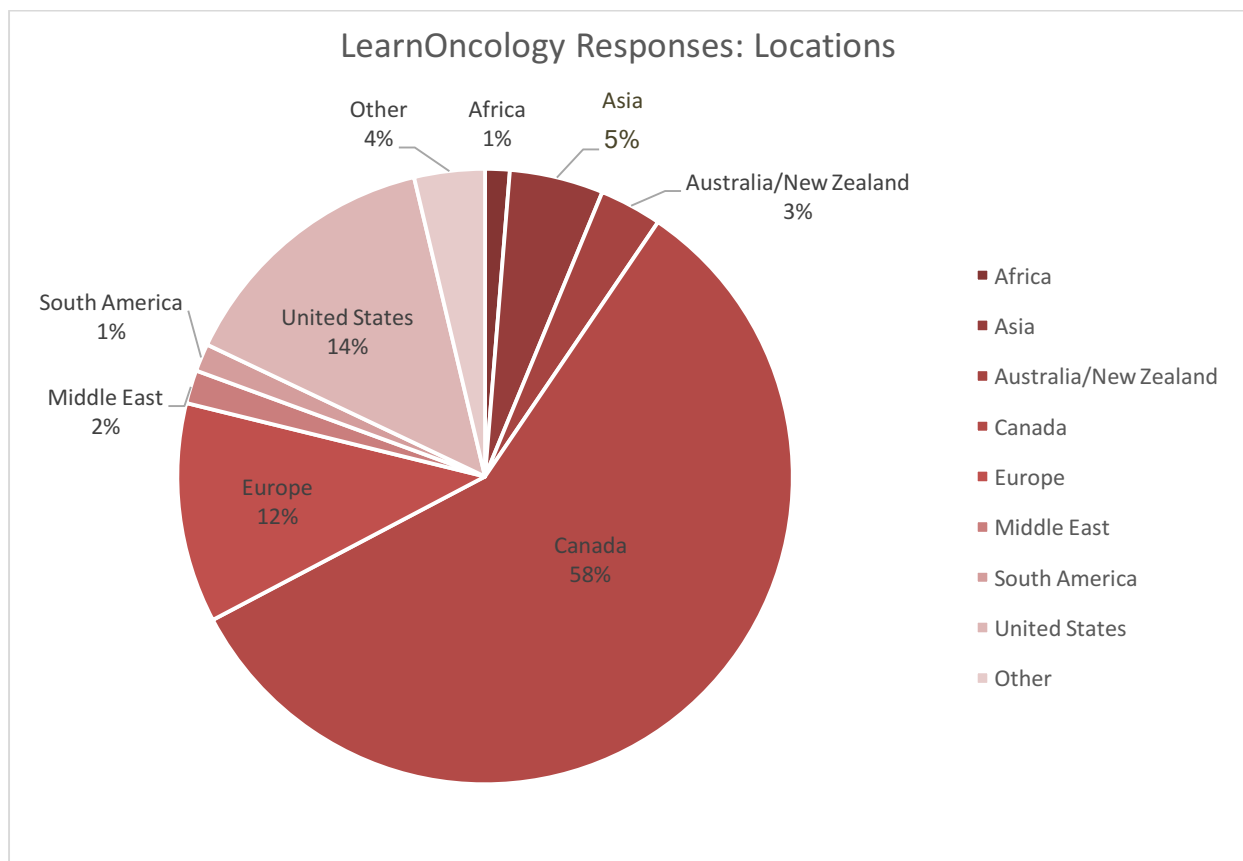


Figure 1: Location of users for learnoncology.ca



The YouTube and White board videos website traffic continues to increase.

Table 2: YouTube videos ranked by views

1. The Staging and Grading of Cancer: 42,554
2. Dysplasia: The Progression of Cancer: 39,071
3. How Radiotherapy Works! 36,500
4. Spinal Cord Compression 10,593
5. Mechanisms of Cancer Spread: 9,199
6. General Principles of Cancer Treatment: 6,779
7. SVC Syndrome: 2,420
8. Brain Metastases: 2,311
9. The 5 W's of Breast Cancer: 1,604
10. The 5 W's of Lung Cancer: 751
11. The 5 W's of Melanoma: 588
12. The 5 W's of Colorectal Cancer: 461
13. 5 W's of Prostate Cancer: 425

As a final part of our evaluation, qualitatively we reflect on the benefits of this site. Since 2008 several medical students and a group of interdisciplinary faculty have worked side by side to develop the web resources. The project had provided the opportunity for students and faculty to gain new skill sets in web-design, curriculum development, implementation and evaluation. There were opportunities for mentoring, and 6 of the summer students are now pursuing postgraduate training in oncology. As the results of the project have been disseminated, students and faculty alike have gained valuable scholarly skills. Students have presented their work at regional, national and international meetings developing skills related to presentation and research dissemination.

There have been additional sustainable benefits of this project. Firstly, the oncology website has generated enthusiasm amongst a variety of students and faculty and is creating a culture of interest in oncology education. Through careful evaluation and implementation, the lessons learned in the development of these resources may also inform other medical disciplines in the construction of new online learning resources. Finally by improving the knowledge, attitudes and skills of medical students with respect to oncology we will educate future physicians to provide improved care to cancer patients.

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.

Oral Presentation, American Federation for Medical Research, February 2017

Oral Presentation: University of Illinois at Chicago, Department of Medical Education Summer Conference July 2017

Oral Presentation, UBC Department of Surgery Chung Research Day, October 2017



Oral Presentation, Radiation Oncology Education Study Group Summer Meeting, University of Chicago, June 2018

Invited Lecture, Western University Radiation Oncology Grand Rounds, June 2018

- 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?

As reflected above in the evaluation, the oncology website has generated enthusiasm amongst a variety of students and faculty and is creating a culture of interest in oncology education. Six students are now participating in UBC Medical School FLEX projects to continue to develop resources. Radiation oncology residents from other universities in Canada are also contributing to the project. Through this snowball of enthusiasm, educators are viewing oncology education in the undergraduate setting as exciting and full of opportunity. Within my own practice, working on this website has allowed me opportunities to incorporate technology into my teaching and ways in which it can be evaluated.

- 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?

Moving out of the 2016/2017 TLEF we need to ensure that we have a plan for sustainability and continued financial support from other sources. The current website has expanded and is not only being used at UBC but also at other universities across Canada, the United States and worldwide. As such there is potential to be supported by national oncology associations.

We have explored external grants and other funding models to maintain the website. A variety of opportunities have presented including sponsorship from national charitable oncology associations and national oncology education grants. The website is low cost to maintain and is currently financially supported by the PI.

As medical students have come to use the website, many have become interested in helping to script materials and add to the site. As such at present 6 students are working in the context of UBC Medical School FLEX research and curriculum development time to add new materials to the site.