Large TLEF Project – Final Report

Report Completion Date: (2017/11/22)

1. **PROJECT OVERVIEW**

    1.1. General Information

Project Title:	West Coast Interprofessional Clinical Knowledge Evidence Disseminator (WICKED)		
Principal Investigator:	Alison Greig		
Report Submitted By:	Alison Greig		
Project Initiation Date:	April 2014	Project Completion Date:	October 2017

    1.2. Project Summary

The overall goal of this project was to develop and test five web-based, interactive, simulated learning modules to teach health professional students the steps of evidence-informed health care (EIHC). In the first year of the project, the team developed a series of five online modules, in a "Virtual Patient case" approach. These modules aligned with the five steps of evidence based practice: (1) translation of uncertainty to an answerable question, (2), systematic retrieval of best evidence available, (3) critical appraisal of evidence for validity, clinical relevance, and applicability, (4) application of results in practice, and (5) evaluation of performance. The content and design of the modules were developed to allow integration into the curricula of all health professional programs. Years 2 and 3 of this project focused on the evaluation of the modules in terms of their (1) implementation into various health professions programs (physical therapy, occupational therapy, and family medicine) and (2) impact on student learning. Feedback gained through the evaluation was also used to enhance and improve the modules and to facilitate the adoption of the modules more broadly.

Team Members – *(Please fill in the following table and include __students__, undergraduate or graduate, who participated in your project).*

Name	Title/Affiliation	Responsibilities/Roles
Joseph Anthony	Clinical Professor	Consultation for teaching and learning technology
Jem Arnold	Student	Assisted in the development of modules and module testing
Charlotte Beck	Reference Librarian	Subject Matter Expert – assisted in module development
Lara Brady	Student	Assisted in the development of modules and module testing
Diana Dawes	Clinical Associate Professor	Subject Matter Expert and lead for module development
Martin Dawes	Head, Department of Family Practice	Subject Matter Expert – assisted in module development
Lilly Edelson	Family Practice Resident	Subject Matter Expert – assisted in

		module development
Alison Hoens	Knowledge Broker and Clinical Professor	Subject Matter Expert – assisted in module development
Maria Hubinette	Clinical Associate Professor	Subject Matter Expert – assisted in module development
Tara Klassen	Graduate Student	Subject Matter Expert – assisted in module development
Connie Lee	Student	Assisted in the development of modules and module testing
Michael Lee	Instructor and Curriculum Coordinator	Subject Matter Expert – assisted in module development
Heather Leslie	Student	Assisted in the development of modules and module testing
Ben Mortenson	Assistant Professor	Subject Matter Expert – assisted in module development
Clair Newlands	Instructional designer	Completed technical aspects of module design and modifications
Cameron Ross	Assistant Professor	Subject Matter Expert – assisted in module development
Leo Willing	Student	Assisted in the development of modules and module testing
Shayna Rusticus	Post-doctoral fellow	Responsible for design and execution of evaluation of modules
Jody Perkins	Research assistant	Assisted in the collection and analysis of evaluation data

***Students / learners were also highly involved in the testing and evaluation of the modules

1.3. Student Impact – *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 impacted by your project, including any 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)
FP Scholarship Rotation	3 sections	2015/16, 2016/17 (and ongoing)	Winter
PHTH 526	2 sections	2015/16, 2016/17 (and ongoing)	Winter
PHTH 566	1 section	2016/17 (and ongoing)	Winter
RSOT 519	2 sections	2015/16, 2016/17 (and ongoing)	Fall
RSOT 527	2 sections	2015/16, 2016/17	Winter

		(and ongoing)	

2. PRODUCTS & ACHIEVEMENTS

2.1. Products and Achievements – *Please **update** project products and achievements as necessary. Indicate the current location of such products and provide an URL if applicable.*

Product(s)/Achievement(s):	Detail
5 online modules	https://connect.ubc.ca/webapps/blackboard/content/listContentEditable.jsp?content_id=_3041587_1&course_id=_76495_1
WICKED Evaluation Logic Model	WICKED Logic Model.pdf
Conference (peer reviewed) Presentations	1. Greig A, Anthony, J; Beck, C; Ross C; Dawes, D; Dawes, M; Hoens, A; Hubinette, M; Klassen, T; Lee, M; Mortenson, B; Newlands, C; Rusticus S. (2016). The West coast Interprofessional Clinical Knowledge Evidence Disseminator (WICKED): An Interprofessional Approach to Teaching Evidence Informed Health Care. In Proceedings of the All Together Better Health Conference, 6-9 September, Oxford. 2. Dawes, D; Greig A, Anthony, J; Beck, C; Ross C; Dawes, M; Hoens, A; Hubinette, M; Klassen, T; Lee, M; Mortenson, B; Newlands, C; Rusticus S. (2016). The West coast Interprofessional Clinical Knowledge Evidence Disseminator WICKED Project. In Proceedings of the North American Primary Care Research Group Conference, 12-16 November, Colorado. 3. Greig A, Dawes D, Anthony J, Beck C, Ross C, Dawes M, Hoens A, Hubinette M, Klassen T, Lee M, Mortenson B, Newlands C, Rusticus S. (2017). The West coast Interprofessional Clinical Knowledge Evidence Disseminator - A "WICKED" approach to teaching evidence informed practice. In Proceedings of the International Clinical Skills Conference (ICSC) 20-24 May, Prato, Italy.
Meeting Presentations	1. Greig A, Rusticus S, Dawes D, Anthony J, Beck C, Dawes M, Hoens A, Hubinette M, Klassen T, Lee M, Mortenson B, Newlands C, Ross C. The WICKED Project: Development, Implementation and Evaluation of Flexible Learning Modules to Teach Evidence Informed Health Care. Teaching and Learning Enhancement Fund (TLEF) Showcase. May 5, 2016. 2. Greig A, Rusticus S, Dawes D, Anthony J, Beck C, Dawes M, Hoens A, Hubinette M, Klassen T, Lee M, Mortenson B, Newlands C, Ross C. The West Coast Interprofessional Clinical Knowledge Evidence Disseminator (WICKED): An interprofessional approach to teaching evidence-informed health care. Teaching and Learning Enhancement Fund (TLEF) Showcase. May 4, 2017.
Papers (in progress)	1. Development of a Set of Five Online Modules for Teaching Evidence Informed Healthcare (draft 80% completed) 2. Impact of Five Evidence Informed Healthcare Online Modules on Student Learning (20% completed)

Item(s) Not Met – *Please list intended project products and achievements that were not attained and the reason(s) for this.*

| Item(s) Not Met:	Reason:
Evaluation of intermediate outcomes (application of EIHC to other course work and clinical placements)	Due to the timing of the modules being adopted by instructors in physical therapy and occupational therapy (i.e., physical therapy not adopting modules 4 and 5 until the final year of the evaluation and occupational therapy not adopting modules 4 and 5 during the evaluation period) we were unable to assess the intermediate outcomes identified, and were only able to focus on the evaluation of the short-term outcomes in the time frame of the project.

3. **PROJECT EVALUATION**

   3.1. **Project Outcomes** – *Please list the intended outcomes or <u>benefits of the project</u> for students, TAs and/or instructors.*

   1. Develop five web-based, interaction, simulated learning modules to teach students the steps of evidence informed health care (EIHC).

   2. Modify courses to reduce face-to-face time through integration of the modules into teaching and learning (i.e. flipped classroom approach).

   3. Provide an opportunity for deeper EIHC learning, through the links available to students within the modules and the ability to access the modules multiple times and from anywhere.

   4. Provide an opportunity for consolidation of EIHC knowledge, through the ability to access the modules multiple times and from anywhere, and the integration across courses within a program.

   5. Produce a comprehensive evaluation plan.

   6. Demonstrate outputs from the program evaluation.

   7. Evaluate the five EIHC modules and the implementation of modules into courses.

   8. Modify the five modules and their implementation process based on evaluation.

   9. Provide access to the modules to all UBC Health Professional programs.

   10. Present evaluation results at conferences and produce a journal publication.

   11. Enhance/improve learning in Health Professional programs related to the knowledge and skills to practice in an evidence-informed approach; in the short term (current course), medium term (future courses), and longer term (clinical practice).

   12. Increase the application of EIHC in clinical practice leading to improved patient care.

   13. Transition to a sustainable project which continues to be accessible and available to learners at UBC and beyond.

3.2. Findings – *Please describe the findings of your project evaluation effort: to what extent were intended project outcomes achieved or not achieved? You are encouraged to include both graphical representations of data as well as scenarios or quotes to represent key themes.*

1. All five modules have been successfully developed and have currently been used by seven instructors teaching physical therapy (PT) students (2 courses), occupational therapy (OT) students (2 courses), and family practice (FP) residents.

2. The current use of the modules has not resulted in courses being modified to reduce face-to-face time. Rather, with OT and PT students the modules have been used to replace pre-existing resources and as an additional activity for students to complete outside of the classroom to supplement their learning of EIHC. The instructors using the modules with FP residents has integrated the modules into the in-class sessions using peer teaching of the modules and other learning activities to review of the modules.

3. A comprehensive evaluation plan of the project was produced that included a mixed methods evaluation of multiple aspects of the project. Quantitative data was gathered via: (1) end of module evaluation surveys, (2) an EIHC attitude survey administered before and after module completion, (3) computer logging data of the frequency of accessing the modules, and (4) an assessment of EIHC knowledge. Qualitative data was gathered via: (1) focus groups conducted with students, and (2) semi-structured interviews conducted with faculty and staff.

4. Figure 3 presents the logic model developed for the evaluation of the modules. As seen in this figure, a number of outputs have been identified from the program evaluation.
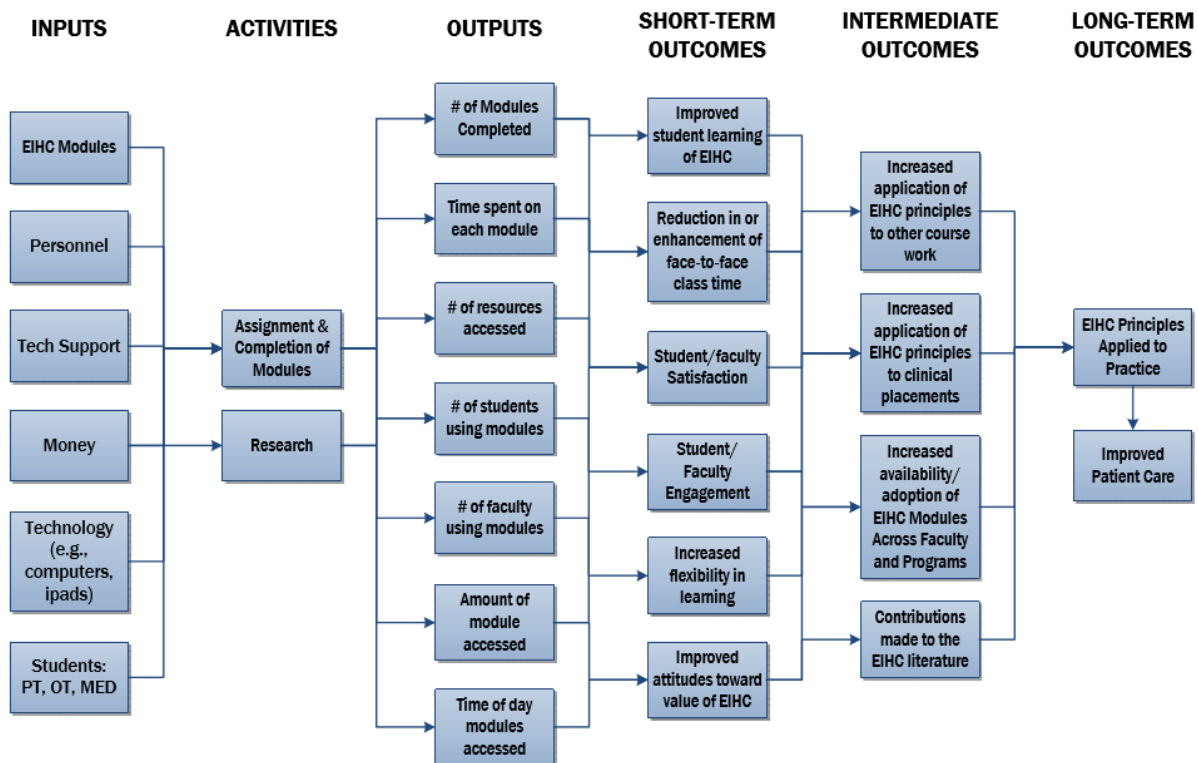

**Figure 3:** Logic model for the evaluation of the WICKED modules

5. The quality of the five modules and their implementation into courses have been evaluated using both quantitative and qualitative data collection (as specified above). A highlight of the key findings from the analysis of this data are:
   - Comments related to technological issues with the modules were identified and refinements were made to the modules prior to their use with the second year of students/residents.
   - Overall, students were very satisfied with their use of the modules, both in terms of navigating through the modules and easily digesting the content of the modules. Students liked the interactive nature of the modules, including the use of videos and questions interspersed throughout the modules.
   - Faculty/staff were also satisfied with their use of the modules. All said they would use the modules again, and now that they are familiar with the modules and have more time to plan their use of the modules, the majority indicated that they would make better use of the modules in the future.
   - The major barrier that emerged regarding module use was the limited emphasis give to the importance of completing the modules by the OT and PT instructors. Students indicated that if they had been given more time for completing the modules, an increased understanding of the importance of the modules, and credit assigned for completing the modules, they would have been more driven to complete the modules, and with increased effort. In large part, the limited emphasis given to students by the instructors had to do with the instructors not having sufficient time to familiarize themselves with the modules prior to assigning them to students.

6. Feedback from the first year of the evaluation identified a number of suggested changes. Surprisingly, the feedback was predominantly related to the technology of the modules, and the learner / computer interface, rather than suggestions to change the content or length of the modules. Technology issues included:
   - Minor technical issues or problems in logging into and navigating through the modules. For example, when enter was pressed when entering information in a "text box" it would submit the answer rather than start a new line of text.
   - Recommended changes for improvements in navigating through the modules (e.g., add a text-to-speech option)
   - Ability to move forwards and backwards through the modules without losing quiz or "text box" input

   Specific changes that were made to these modules in regards to this feedback included modifying settings in the modules in order to address the above concerns.

7. Students have appreciated the online nature of the modules and, as seen in Figures 1 and 2 below, have accessed the modules across all seven days of the week.
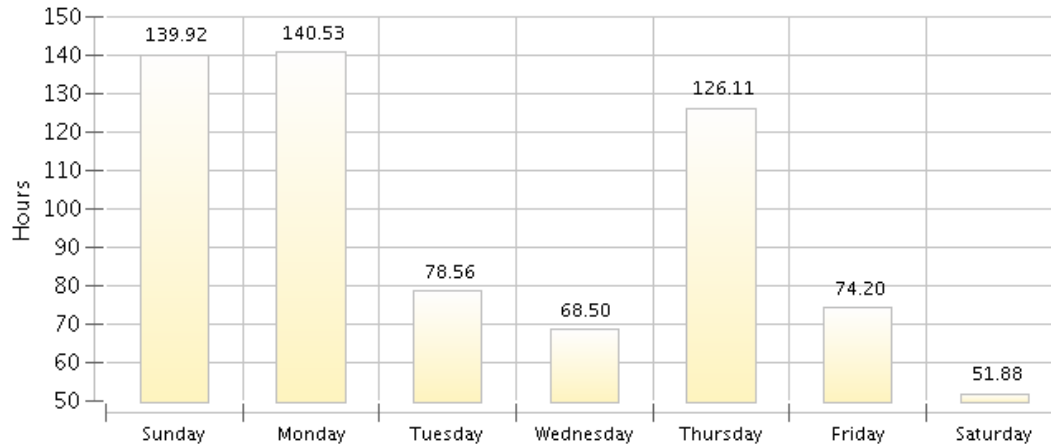
Figure 1: Hours spent logged into the modules between September 2015 and May 2016
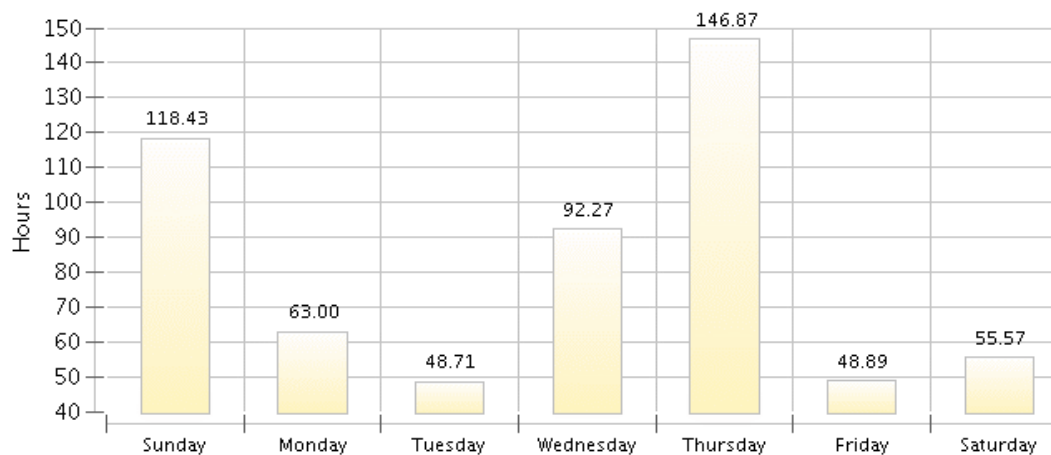
Figure 2: Hours spent logged into the modules between September 2016 and May 2017

8. Students maintain their ability to access to the modules allowing them to review the modules when and where they choose. For both PT and OT students, the modules have bridged across courses, allowing for the continuation and integration of their learning.
9. Feedback from students has indicated that students are making limited use of the links available within the modules.
10. Interest in the modules by other programs/user groups has been expressed (e.g., Undergraduate Medicine, Dental Hygiene, Midwifery, and Clinical Practitioners) and discussions have been ongoing with these programs. Use of the modules by other programs has been encouraged.
11. Aspects of the module development and evaluation have been presented at several conferences (see section 3.4). The intention is to also publish two papers on the development of the modules and their evaluation.
12. Due to course scheduling in the OT and PT programs, only the short-term outcomes were able to be evaluated within the time frame of the TLEF funding. The short-term outcomes have been identified in the logic model in Figure 3. Short-term outcomes included:

a. **Improved student learning of EIHC:** Improved student learning was assessed by comparing PT students' pre-modules and post-modules scores on an EIHC competence assessment. The results showed a statistically significant and large increase (22%) in student scores on the Fresno Test of Competence at the end of the term (note that this includes the confound of classroom time spent on teaching EIHC as well).

b. **Reduction in or enhancement of face-to-face class time:** Although no reduction in face-to-face class time was reported, enhancement of class time was reported by some of the instructors who were interviewed. They indicated some integration of the modules into their class time (FP instructor) or changes to the focus of their content to more applied examples rather than focusing on basic content knowledge because the students could pick up the knowledge through the modules (librarian).

c. **Student/faculty satisfaction**: In the focus groups with students, they reported that they were generally satisfied with their use of, and interaction with, the modules. Quantitative items assessing students' satisfaction with their level of interaction with the modules, the online module approach to learning, and the use of the modules to support classroom learning were each rated as moderately satisfied (means of 3.02, 2.94, and 2.99, respectively, on a 5-point satisfaction scale.

d. **Student/faculty engagement:** Qualitative data from the focus groups with students and interviews with faculty/staff indicated that both groups were engaged with the modules. For students, they reported that the design of the modules, the use of the videos, and the interactive questions within the modules contributed to their engagement. Engagement could have been increased if the importance of the modules had been emphasized more strongly to them by their instructors, if they had more time available to them to work through the modules, and if they had been assessed on their completion of the modules. Faculty/staff reported that they would continue to use the modules and they found them to be a valuable resource. Quantitative data on the amount of effort students put into the modules indicated that the majority of students put in at least a moderate effort in completing the modules: Module 1 = 84%, Module 2 = 87%, Module 3 = 57%, Module 4 = 66%, Module 5 = 65%.

e. **Increased flexibility in learning:** As seen in Figures 1 and 2 above, students had flexibility in when they chose to access the modules. Focus group feedback also indicated that students liked the online nature of the modules and being able to access them when and where they chose.

f. **Improved attitudes toward value of EIHC:** A paired samples t-test comparing PT and OT students' attitudes toward EIHC before and after completing the first three modules showed a statistically significant increase for both groups: OT increased from a mean of 3.38 to 3.63 on a five point strongly disagree (1) to strongly agree (5) scale; PT increased from 3.49 to 3.79.

13. Qualitative data indicated that most students did not experience enhanced interprofessional learning through their engagement with the modules. Students noted that they received more effective and direct interprofessional training from other sources. In some cases, students commented that the interprofessional design of the modules reduced the effectiveness and relevance of the modules for their specific profession. For instance, they commented that the medicine-focused examples were often not relevant to their profession.

14. A paired samples t-test comparing PT and OT students' implementation of EIHC into their practicums/clinical practice before and after completing the first three modules did not show a

statistically significant increase in their application of EIHC. This was likely due to the limited clinical practice experiences the students have had at this point. In addition, given that only the short-term outcomes were ultimately assessed in this evaluation, this project outcome was not able to fully assessed.

15. The modules have been recently updated to transition to new software, and update the links to external resources, which will allow users to continue to use and access the modules.

3.3. Data Collection and Evaluation Methods – *Please describe the data collection strategies used, how the data was analyzed, and perceived limitations.* ***Note: Please attach copies of data collection tools (e.g. surveys and interview protocols) and any additional data or other relevant items.***

A mixed-method approach was used to evaluate the five modules. Quantitative data was gathered via: (1) end of module evaluation surveys, (2) an EIHC attitude survey, (3) computer logging data, and (4) the Adapted Fresno Test of Competence. Qualitative data was gathered via: (1) focus groups conducted with students, and (2) semi-structured interviews conducted with faculty and staff. At the end of each of the five modules, and embedded within the module, was a link to a short, end of module evaluation survey asking for feedback on respondent satisfaction and engagement with the modules (See Appendix A.1). These data were analyzed descriptively and frequency tables were calculated for each of the survey questions. It was optional for respondents to complete this survey, thus a limitation of this data is that not all respondents completed the survey items.

Prior to accessing the modules, users were required to review and indicate their consent to participate in the evaluation of the modules. They were then required to complete the pre-module EIHC attitude survey (See Appendix A.2). This survey consisted of three measures: (1) the EBM Course Self-Assessment (Yost, Ciliska & Dobbins, 2014), (2) the EBP Beliefs Scale and (3) the EBP Implementation Scale (Melnyk, Fineout-Overholt, & Mays, 2008).

All individuals were required to complete the pre-module EIHC attitude survey, regardless of whether they gave consent or not (a limitation of how the survey was set up within Connect), but only the data of those that gave consent were used in the evaluation. After completing the third EIHC module, PT and OT students were asked to complete a post-module version of this survey. Participants for the post-modules survey were recruited through in-class announcements and they completed the survey in either a paper format or were given a link to complete an online version of the survey. This process was completed for two cohorts of PT and OT students.

The EBM course Self-Assessment was analyzed descriptively, with descriptive statistics presented for each of the items. Total scores were calculated for the EBP Beliefs Scale and Implementation Scale and t-tests were used to analyze the change in scales pre-and post-modules. Two limitations of this data need to be noted. One, in the first year of the evaluation, the way the pre-module survey was set up in Connect did not allow for the matching of student responses between the pre-module and post-module surveys, thus an independent measures t-test was used to analyze the data. This was corrected for the second year of the evaluation, and a paired t-test could be conduct to analyze the data. A second limitation is that less than half of the students completed the post-module survey which raises concerns about the representativeness of the final sample and the t-test conclusions.

Computer logging data, which consisted of module usage data (average amount of time spent accessing the modules (individually and overall) and the days of the week the modules were most frequently accessed) was examined for both years of the evaluation through the Connect system. These data were analyzed descriptively. A limitation of these data were that respondents may have left their computer with the modules open, which resulted is some cases of exceptionally long times being recorded for module usage.

The Adapted Fresno Test of Competence (McCluskey & Bishop, 2009) was administered to the first cohort of PT students (See Appendix A.3). They completed the test prior to accessing the modules and again after completing the third module to assess change in EIHC knowledge. A t-test was used to compare the total Fresno score between these two administrations. Limitations of this data relate to the challenge in scoring the Fresno test and the inability to isolate the effect of the modules in looking at changes in student knowledge (i.e. it is confounded with their regular course learning). Lacking a control group who did not do the modules (because all PT students were required to complete the modules) is also a limitation of this analysis.

A total of 7 focus groups, using a semi-structured interview format, were conducted with 2 cohorts of PT and OT students (6 focus groups in total) and 1 cohort of FP residents (1 focus group). See Appendix A.4 for the interview guide. One focus group was conducted via phone and the remaining focus groups were conducted in person. Focus groups consisted of 4-11 participants and each group was asked the same general set of questions. All focus groups were audio-recorded. A total of 8 individual interviews were conduct with faculty/staff involved in teaching with the modules; some individuals were interviewed twice because they were involved in the teaching if multiple cohorts of students. Interviews were either conducted in-person or via phone and followed a semi-structured interview format (See Appendix A.5). Some interviews were audio-taped.

Detailed time logs were created for the content of the focus group recordings and interview recordings/notes. Thematic codes were created by closely reading the logs and analyzing and interpreting the content to identify basic shared themes that emerged directly from the data, such as "engagement with modules" and "module design." These thematic codes were then applied to relevant segments of the focus group and interview logs.

An additional evaluation component of this project involved recruiting a group of graduating PT students in the summer of 2016. These students had not completed any WICKED modules as part of their course work (as they had taken the respective courses before the modules were developed). Twenty students participated in this session (split into 2 groups), which involved completing the EIHC attitude survey, the Fresno, and participating in a focus group on their perceptions of EIHC. See Appendix A.6 for the interview guide. The focus groups were audio-recorded and the data coded thematically, as described above. In the summer of 2017, second year PT students, who had completed all 5 WICKED modules were recruited to complete the EIHC attitude survey, the Fresno, and participate in a focus group session to provide feedback on the WICKED modules. Five students participated in this session. Because of the small number of participants in the second group, quantitative data analysis comparing the survey and Fresno scores could not be conducted.

3.4. Dissemination – *Please provide a list of **past** and **future** scholarly activities (e.g. publications, presentations, invited talks, etc.) in which you or anyone from your team have or intend to disseminate the outcomes of this project.*

Conference Presentations:

- **TLEF poster sessions (2016 and 2017)**
  - ○ The West Coast Interprofessional Clinical Knowledge Evidence Disseminator (WICKED) Evaluation: Year 2
  - ○ The West Coast Interprofessional Clinical Knowledge Evidence Disseminator (WICKED) Evaluation: Year 3
- **North American Primary Care Research Group Conference, Colorado USA (2016)** - The West Coast Interprofessional Clinical Knowledge Evidence Disseminator (WICKED) Project
- **All Together Better Health, Oxford England (2016) -** The West coast Interprofessional Clinical Knowledge Evidence Disseminator (WICKED): An Interprofessional Approach to Teaching Evidence Informed Health Care
- **International Clinical Skills Conference (ICSC), Prato Italy (2017)** - The West coast Interprofessional Clinical Knowledge Evidence Disseminator - A "WICKED" approach to teaching evidence informed practice

Publications:

- We anticipate publishing 2-3 papers based on the WICKED project. One paper will be focused on the development of the modules and 1-2 papers will focus on the evaluation of the modules.

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?*

Yes, the teaching practices of those instructors using the modules has changed. The instructor teaching the FP residents has integrated the modules fully into her sessions with her residents by using peer teaching strategies and other interactive learning strategies which involve the WICKED modules. Other instructors, who used the modules as an "additional resource" for learners, reported that they intend to modify their courses in the future to better integrate the modules into their courses. It is anticipated that their teaching practices will change in ways that better allow for the blending of online and in-class instruction to facilitate the teaching of EIHC to students/residents. These changes should be sustainable over time as the modules will remain available to students and instructors through the Connect system.

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?*

The project sustainment strategy relates to the ongoing access to the WICKED modules for programs / courses / learners, and maintaining the modules so that the content and links remain current. At present, the modules are situated in the learning management system, and are available to users of Connect (and Canvas). Access to the modules is facilitated by IT services in the Faculty of Medicine, with the assistance of the consultant for teaching and learning technology (J. Anthony). Monitoring the currency of links and content is managed by the

project team and users (instructors and students), and minor changes to the modules can be done at a unit-level with minimal associated costs. Overall, the evaluation of the modules indicated only minor modifications to the software settings, and updating the module links incurred minimal cost. Changes in the longer term may be more substantial, and resources to support the changes will need to be sources from the respective departments.

As mentioned above, it is intended that these modules will continue to be adopted by addition health professional programs and possibly the broader clinical community. The project lead (A. Greig) will continue to promote the use of the modules.

Appendix A.1

End of Module Evaluation Survey

1. Enter the total time you_ spent on this module:

    ___ <15 minutes

    ___ 15 to 30 minutes

    ___ 30 to 60 minutes

    ___ 60 to 90 minutes

    ___ > 90 minutes

2. I think this module was

    ___ too short

    ___ just right

    ___ too long

3. How much effort did you put into completing this module?

    ___ low effort

    ___ moderate effort

    ___ high effort

4. Did you access any additional resources within this module (i.e., links to websites, articles)?

    ___ Yes

    ___ No

5. In comparison with before you undertook this module, how confident do you feel in [writing an answerable question (module 1)] [searching for evidence to answer questions (module 2)] [appraising evidence (module 3)] [applying evidence to practice (module 4)] [assessing the application of the evidence (module 5)]?

    ___ Less confident

    ___ No change

    ___ Slightly more confident

    ___ Moderately more confident

    ___ Significantly more confident

6. I think this module will contribute to my ability to be an evidence-based practitioner

    ___ Not at all

    ___ Slightly

    ___ Moderately

    ___ Significantly

7. What changes would you like to see made to this module?

Appendix A.2
Evidence Informed Health Care Self-Assessment

The following questions ask about your confidence in and experience with evidence informed health care (EIHC).

SECTION 1: Please indicate the level of confidence you have for the following activities:

	Not confident	Somewhat confident	Reasonably confident	Very confident	Extremely confident
1. Formulate a patient focused clinical question	○	○	○	○	○
2. Quickly find a relevant article that addresses a clinical question through a literature search on PubMed	○	○	○	○	○
3. Critically assess a journal article for possible sources of bias	○	○	○	○	○
4. Assess the results of a clinical research article	○	○	○	○	○
5. Calculate absolute risk reduction, relative risk reduction, and number needed to treat	○	○	○	○	○
6. Use a likelihood ratio	○	○	○	○	○
7. Apply the results of studies to my patient care	○	○	○	○	○

	Never	Once or twice	Many times	Regular activity	Not applicable
8. In the clinical setting, have you *observed* the practice of EIHC (searching the literature, evaluating articles, and applying results to patients)?	○	○	○	○	○
9. In the clinical setting, have you *participated* in the practice of EIHC (searching the literature, evaluating articles, and applying results to patients)?	○	○	○	○	○

10. How have information and training on the steps of EIHC been provided to you? Check all that apply.

○	Faculty lectures in class
○	Library sessions
○	Online tutorials
○	Clinical staff in hospitals
○	Attendings on rotations
○	Clinical core sessions
○	Research mentors
○	Peers
○	Self-study
○	Other
○	I have not received any information or training on EIHC

Other (please specify): _____

SECTION 2: Indicate your agreement with the following statements:

	Strongly disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Strongly agree	Don't know
1. EIHC is time consuming and cannot be done during day-to-day patient care.	❍	❍	❍	❍	❍	❍
2. EIHC is "cookbook medicine."	❍	❍	❍	❍	❍	❍
3. EIHC relies too much on statistics.	❍	❍	❍	❍	❍	❍
4. I believe that EIHC results in the best clinical care for patients.	❍	❍	❍	❍	❍	❍
5. I am clear about the steps of EIHC	❍	❍	❍	❍	❍	❍
6. I am sure that I can implement EIHC	❍	❍	❍	❍	❍	❍
7. I believe that critically appraising evidence is an important step of the EIHC process	❍	❍	❍	❍	❍	❍
8. I am sure that evidence-based guidelines can improve clinical care.	❍	❍	❍	❍	❍	❍
9. I believe that I can search for the best evidence to answer clinical questions in a time efficient way.	❍	❍	❍	❍	❍	❍
10. I believe that I can overcome barriers in implementing EIHC.	❍	❍	❍	❍	❍	❍
11. I am sure that I can implement EIHC in a time efficient way.	❍	❍	❍	❍	❍	❍
12. I am sure that implementing EIHC will improve the care that I deliver to my patients.	❍	❍	❍	❍	❍	❍
13. I am sure about how to measure the outcomes of clinical care.	❍	❍	❍	❍	❍	❍
14. I believe that EIHC takes too much time.	❍	❍	❍	❍	❍	❍
15. I am sure that I can access the best resources in order to implement EIHC	❍	❍	❍	❍	❍	❍
16. I believe EIHC is difficult.	❍	❍	❍	❍	❍	❍
17. I know how to implement EIHC sufficiently enough to make practice changes.	❍	❍	❍	❍	❍	❍
18. I am confident about my ability to implement EIHC where I work.	❍	❍	❍	❍	❍	❍
19. I believe that the care I deliver is evidence-based.	❍	❍	❍	❍	❍	❍

SECTION 3: How often in the past 8 weeks have you performed each item?

	0 times	1-2 times	3-4 times	5-7 times	> 8 times
1. Used evidence to change my clinical practice.	❍	❍	❍	❍	❍
2. Critically appraised evidence from a research study.	❍	❍	❍	❍	❍
3. Generated a PICO question about my clinical practice.	❍	❍	❍	❍	❍
4. Informally discussed evidence from a research study with a colleague.	❍	❍	❍	❍	❍
5. Collected data on a patient problem.	❍	❍	❍	❍	❍
6. Shared evidence from a study/ies in the form of a report or presentation to >2 colleagues	❍	❍	❍	❍	❍
7. Evaluated the outcomes of a practice change	❍	❍	❍	❍	❍
8. Shared an EIHC guideline with a colleague	❍	❍	❍	❍	❍
9. Shared evidence from a research study with a patient/family member	❍	❍	❍	❍	❍
10. Shared evidence from a research study with a multidisciplinary team member	❍	❍	❍	❍	❍
11. Read and critically appraised a clinical research study	❍	❍	❍	❍	❍
12. Accessed the Cochrane database of systematic reviews	❍	❍	❍	❍	❍
13. Accessed the National Guidelines Clearinghouse	❍	❍	❍	❍	❍
14. Used an EIHC guideline or systematic review to change clinical practice where I work	❍	❍	❍	❍	❍
15. Evaluated a care initiative by collecting patient outcome data	❍	❍	❍	❍	❍
16. Shared the outcome data collected with colleagues	❍	❍	❍	❍	❍
17. Changed practice based on patient outcome data	❍	❍	❍	❍	❍
18. Promoted the use of EIHC to my colleagues	❍	❍	❍	❍	❍

SECTION 4: Rate your satisfaction with the following statements. POST-TEST ONLY

	Not at all satisfied	Slightly satisfied	Moderately satisfied	Very satisfied	Completely satisfied	N/A
1. The level of interaction with the modules.	❍	❍	❍	❍	❍	❍
2. The online module approach to learning EIHC.	❍	❍	❍	❍	❍	❍
3. The use of the modules to support your classroom learning.	❍	❍	❍	❍	❍	❍

Appendix A.3

EVIDENCE INFORMED HEALTH CARE TEST OF COMPETENCE

This assessment consists of 8 short answer questions. You have up to 60 minutes to complete the test.

Scenario:

You have just evaluated Mary, a secretary who recently experienced a work related low-back injury moving 10, 25 lbs. file boxes 3 days ago. Her radiographs are negative and her only symptom is resolving 2/10 pain across the low back with forward bending and prolonged sitting. She has been off of work for 2 days and is eager to return but is also anxious about re-injury. You are considering a stabilization exercise program but wonder if manual therapy should be included in the patient's physical therapy program.

1. Write a focused clinical question for the above scenario, which will help you to organize a search of the clinical literature.

2. Where might you find answers to this and other similar clinical questions? Name as many possible sources of information as you can - not just the ones you think are "good' sources. Describe the advantages and disadvantages of each type of information source you have listed.

Information source	Advantages of this source	Disadvantages of this source

3. What type of study (design) would best answer your clinical question (see Q 1) and why?

4. If you were to search Medline, CINAHL or any other database for original research to answer your clinical question, describe the search strategy you might use. Be as specific as you can about which topics and search categories (fields) you would use. Explain your rationale for taking this approach. Describe how you might limit your search if necessary and explain your reasoning.

(a) Write your search strategy below:

(b) Explain your rationale for taking this approach?

(c) How might you limit your search, and why?

5. When you find a report of original research on this question or any others, what characteristics of the study will you consider to determine if it is <u>relevant</u>? Questions 6 and 7 will ask you how to determine if the study is valid and how important the findings are.   For this question, please focus on how to determine if it is really <u>relevant </u>to your practice.

6. When you find a report of original research related to your clinical question or any others, what characteristics of the study will you consider to determine if its findings are <u>valid</u>? (You've already addressed relevance, and Question 7 will ask how to determine the importance of the findings. For this question, please focus on <u>the validity</u> of the study).

7. When you find a report of original research which relates to your clinical question or any others, what characteristics of the findings will you consider to determine their <u>magnitude and significance </u>(clinical and statistical)?

Appendix A.4

Student/Resident Interview Guide

1. How easy was it to login and navigate the modules?

2. Did you complete all of the learning tasks/assessments within the modules? Why or why not?

3. How much effort did you put into completing the modules/tasks?

4. Did you access any of the additional resources within the modules? Why or why not?

5. If yes, in what ways were these additional resources helpful or not helpful?

6. How effective were the modules in increasing your understanding of EIHC?
7. What impact did the modules have on increasing your understanding of interprofessional learning?

8. What did you like most about the modules?

9. What did you like least about the modules?

10. Did you encounter any challenges in using these modules? If yes, explain.

11. Is there anything you would change about the modules?

Appendix A.5

Faculty/Staff Interview Guide

1. Which course(s) were you teaching this past term for which you used the EIHC modules?

2. How have you previously taught EIHC in your course?

3. Which modules did you use in your course and why?

4. How did you use these modules within your course? (i.e, reduced lecture time, etc.)

5. What impact did using these modules have on your teaching?

6. What impact do you think using these modules had on student learning?

7. Did you encounter any challenges in using these modules? If yes, explain.

8. Were you satisfied with your use of these modules? Why or why not?

9. Would you use these modules again? Why or why not?

Appendix A.6

Non-WICKED PT Students Interview Guide

1. How would you define EIHC?

2. How have you been taught EIHC in your program?

3. How effective has this teaching been? What have you liked/not liked about how it has been taught?

4. What do you think would be the most effective way to teach EIHC?

5. How important do you think it is to apply EIHC to patient care?

6. Have you ever applied EIHC to patient care? If yes, can you provide an example?

7. How confident do you feel in applying EIHC to patient care?

8. What could be done to make you feel more confident?

9. How frequently do you see EIHC being applied by your colleagues? Can you provide an example?

10. Do you have any suggestions for how EIHC could be better/more frequently used by colleagues/departments?

11. Any final comments or questions?