



# TLEF Project – Final Report

Report Completion Date: (2019/09/20)

## 1. PROJECT OVERVIEW

### 1.1. General Information

<b>Project Title:</b>	Strengthening Students’ Self-Reflective Skills and Enhancing Assessment Consistency in Restorative Dentistry via a New Digital Dental Technology		
<b>Principal Investigator:</b>	Dr. Vincent Lee & Dr. Ross Bryant		
<b>Report Submitted By:</b>	Dr. Vincent Lee & HsingChi von Bergmann		
<b>Project Initiation Date:</b>	April 2017	<b>Project Completion Date:</b>	July 2019
<b>Project Type:</b>	<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

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
HsingChi von Bergmann	Professor	Conduct interview and analyze all data
Yidan Zhu	Post-doctoral Fellow	Conduct interviews and analyze qualitative data
Ahmed Ballo	Graduate student	Helped students with digital technology

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)
Dent 430 Restorative Dentistry 3		2017/18	Fall & 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:
Elucidated that students value the immediacy of the less subjective digitally obtained feedback; however, students acknowledged that they still needed instructors to help interpret or apply the feedback.	

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:
Evaluation of self-assessment of clinical exercises	Inconsistent student participation in self-assessment component

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.

Students felt they trusted the digital technology to provide immediate and less objective feedback; however, they still felt the reliance on instructor input and feedback. This result has shown that while a



digital feedback technology is a valuable pedagogical tool it does not completely supplant the more subjective feedback from clinical instructors. In addition, there was no observable improvement in clinical operating precision based solely on their limited exposure to the digital technology.

Instructors felt that the technology was difficult to learn and required more instruction and calibration to feel comfortable interacting with the software. This highlights the difficulty and importance for instructor instruction and calibration with respect to the adoption of any new digital technology within our learning context.

**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.***

Clinical operating precision assessment data captured through the analysis of student performance on a particular clinical procedure conducted in a crossover study design. The rubric based results were compared with and without exposure to the digital technology utilizing Chi-squared statistical tests.

Student and instructor experience were obtained through semi-structured interviews. 12 interviews with the students, we have conducted 4 additional in-depth interviews with the instructors and faculty members at the Faculty of Dentistry, UBC. Each interview took about 60-90 minutes. Interview data have been transcribed. We have finished a 107-page coding report for data analysis. A qualitative coding table has been developed. The investigators used the Nvivo software to do the interview data coding process.

Based on the preliminary analysis, students reported positively toward the digital technology and reported higher engagement; students felt they trusted the digital technology to provide immediate and less objective feedback; however, they still felt the reliance on instructor input and feedback. Furthermore, instructors felt that the technology was difficult to learn and required more instruction and calibration to feel comfortable interacting with the software.

**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.***

By analyzing the quantitative and qualitative data, we have drafted conference papers. We have presented the papers in the UBC Faculty of Medicine's Center for Health Educational Scholarship (CHES) 2018 conference (October 2018), International Association of Dental Research (IADR) conference (June 2019) and Canadian Society for the Study of Education (CSSE) congress (June 2019).

We are now writing a peer-reviewed journal article to be submitted to the Journal of Dental Education. The paper will be finished by October 2019.



**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?*

At present, due to the limited nature and scope of this project the results have not immediately changed teaching practices within our division. The limited number of the digital technology units is due to the machine plus license of the software are quite costly and more units are necessary to make a more significant impact on our teaching and learning practices. The interview data gathered from the students indicated how the limited access to the machine being a challenge for their learning. In addition, the ongoing maintenance fees for the systems are a significant hurdle in the context of our faculty.

- 4. 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?*

There is an increasing interest and desire to incorporate more variety of digital technologies into our pre-clinical simulation dental education. We are acutely aware that students are interested in digital technology as part of their education and we are considering incorporating more of the assessed digital feedback system but also virtual reality and haptic systems. Based on our findings, a robust thorough curricular development plan will be needed to create a timeline of integration and instructor calibration. In addition, it may also take several years to obtain the necessary funds to be able to acquire and maintain the technology in an ongoing nature.