

From: [Langara | Applied Research Center](#)
To: [Tomoko Okochi](#)
Cc: [Applied Research](#)
Subject: Thank you for submitting your ARC Final Report
Date: Monday, August 19, 2024 1:59:32 PM

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Thank you for submitting
ARC Final Report

Our team may reach out to you with follow-up requests for clarification regarding your submission.

Review your submission responses below:

Researcher First Name: **Tomoko**

Researcher Last Name: **Okochi**

Department: **Web and Mobile Design and Development**

Other Department:

Project Title: **Examining the impact of flipped classroom delivery On new international students' performance in a practical coding course; challenges, benefits and external influences**

Start semester: **9/1/2022**

End Semester: **8/31/2024**

Introduction - Please introduce yourself and include

pertinent background information as it relates to your project's research area. Tomoko Okochi, faculty at Web and Mobile App Design and Development (WMDD) PDD program. Tomoko has taught the introductory practical programming course, WMDD 4815 HTML/CSS I, several times. Carmen Larsen, TCDC Curriculum Consultant Carmen has knowledge of flipped and traditional classroom design as well as educational research methods. She facilitated a flipped classroom workshop for the WMDD faculty prior to this study; therefore, Tomoko reached out to her when she decided to do this study.

Please discuss your educational background and your work experience as it relates to this project. If possible, include a quote that helps define your interest in the project. Tomoko Okochi has experience teaching in post secondary settings over 10 years. While Tomoko was teaching the first-term course, she observed some students having difficulty achieving outcomes in flipped classroom delivery and wanted to find out what are the factors that influence this tendency and also what can be done to improve their learning outcomes. Carmen Larsen has a master's degree in education and has designed and taught online, blended and face-to-face courses for over 20 years. She has been working as a curriculum consultant at Langara for nearly 8 years, teaching and supporting faculty with curriculum design and pedagogy. She was interested in supporting this project because most of her career she has worked with international students and was keen to learn more about how different teaching methodologies may be advantaging and/or disadvantaging certain demographics of students.

Please summarize your project in plain language that others not in your field could understand. The project compared the effectiveness of two delivery modes: traditional live lecture and flipped classroom. In the Web and Mobile App Design and Development (WMDD) PDD Program at Langara College, 40% of instructors who teach practical coding and design courses provide learning materials for students to review before class, while 50% of instructors provide videos and other online materials AFTER a live class, and 30% teach their courses mainly by live lecture. (Some instructors take different approaches for each course, thus the sum is over 100%) Although a lot of the existing research on flipped design indicates that this delivery mode can better support learning, very few studies take into consideration extra-curricular challenges that many new international students face when they first arrive in a new country. These challenges include a lack of experience with flipped classroom design and the independent learning it requires, as well as lack of information about what they need to be successful in their program such as where to purchase school supplies (e.g., a monitor) and where to go for support at the college. The researchers hypothesized that due to this lack of readiness and the pressures faced by recently arrived international students (e.g., finding housing, working, settling in a new country) flipped learning may not be as effective for new international students as reported by other studies.

Identify the project goals and objectives. Explain how the results may be used to solve a problem or inform further research in the field. The goal of this project was to find which factors influence the effectiveness and outcomes of the flipped classroom to inform decisions about which delivery mode is best for the student population of WMDD. The trend we found in this research can be studied further to find the most effective approach in teaching practical programming courses to new international students with diverse backgrounds.

Briefly explain the steps taken (methods used) to conduct

the research, and describe the key findings. The purpose of this study was to research the experiences of international students to better support their learning in the future. Unfortunately, at this time, provincial and federal changes to student visa applications has greatly reduced the number of international student registrations in WMDD. Therefore, further research is not possible at this time.

Who was involved in this project (eg. faculty, students, community partners)? How did their involvement contribute to the project's success? Were there any challenges to overcome? Tomoko Okochi (Faculty Member in Web and Mobile App Design and Development PDD program) Carmen Larsen (TCDC Curriculum Consultant) Dee Batt (Student Research Assistant) Kyaw Shane (Student volunteer)

Please share any personal stories that made this research experience memorable/valuable.

We could work with amazing people through this project and we felt a stronger connection to the college community. We also took part in the AR day that enabled us to meet many people in the community. The student researcher could also shine pitching the project.

What are the next steps for this project and for you as a researcher?

Research Design Asked new students in WMDD 4815 HTML/CSS I course in Fall 2022 and Summer 2023 to participate in the survey Participants were asked to fill out three online surveys: before the course started, after the mid-term exam, and after the course completion Participants were asked to take HTML/CSS skills test twice: before the course started and after the completion of the course Interview of the instructor and the instructional assistant were done to obtain qualitative data Who were our participants New students in WMDD taking term 1 HTML/CSS I course Flipped classroom -6 students from Fall 2022 completed all three surveys and skills test -6 students from Summer 2023 completed all three surveys and skills test -70% of students had no experience with flipped classroom Traditional live lecture delivery -8 students from Summer 2023 completed all three surveys and skills test Out of the 20 students who participated in this study, 19 were newly arrived international students. Findings Due to the small number of participants, the quantitative data did not yield statistically significant findings. Yet, the data is suggestive of a trend that can be studied in more depth in future studies. Student Readiness -The success of flipped classrooms might be attributed to students' readiness for online learning and having necessary devices (i.e., external monitor) available. In the flipped group, 67% of students had no previous experience with blended learning, and several didn't have access to monitors that would allow them to code along while watching videos at home. Comparison of Two Delivery Modes -There was no difference in learning gains between students in the flipped course versus the traditional course; however, due to the random selection of participants more students in the flipped cohort had previous experience with HTML/CSS. Fifty eight percent of students in the flipped group had taken coding courses in the past, whereas only 26% of students in the traditional group had taken coding courses. This lack of difference may also stem from the low participant numbers, so further research is needed. -Students taking the flipped course studied more than the students in the traditional course. It is likely that the opportunity to watch videos more than once and pause them when needed contributed to longer study time in the flipped cohort. Findings Specific to Flipped Cohort -Even though the majority of students in the flipped courses stated that they found the follow-along videos helpful, the

percentage of videos watched declined over time. Midterm Survey Videos watched -75% - watched all videos -17% - watched 80-95% of the videos -8% - watched 60-80% of the videos Final survey Videos watched -42% - watched all videos -25% - watched 80-95% of the videos -8% - watched 60-80% of the videos Although the expectation to study the materials before coming to class was made clear to students in the flipped group, less than 20% reported watching all of the videos. Data from Final Survey Percentage of videos watched BEFORE class -17% - 100% of the videos -33% - 81-95% of the videos -33% - 61-80% of the videos -17% - 41-60% of the videos Students gave several reasons for not watching all videos; however, the predominant reason was need to complete homework from other WMDD courses. The WMDD program is an intensive program that requires students to take 5 courses in the first semester. Data from Final Survey Reasons for not watching videos -83% - other homework -50% - bad time management -33% - work -33% - family -17% - used other resources Benefits, Challenges, External Influences The following information was taken from written responses from student surveys and interviews with the course instructor and teaching assistant. Flipped Classroom Benefits -Self-paced learning -Deeper understanding of course materials by revisiting the content multiple times. Reflected in fewer students visiting office hours or sending emails to ask questions. Challenges / barriers Flipped learning characteristics -Not being able to ask questions and get clarifications right away. E.g. Working on the material in the evening -The need for additional investment by students to fully engage in the learning experience (e.g., students had to buy an external monitor to watch the instructor's video while using the laptop to see their own coding screen) Students' commitment -The success of the flipped classroom model depends on students willingness / ability to review lecture content before class. If students ignore this, it can result in failure, as they may spend class time watching videos instead of engaging with assignments. -Some students prioritize work over studies, while others struggle with procrastination Time constraints in the two-hour lab -If students watch the video but can't complete the assignment in class, it poses a challenge as they may struggle to find time to catch up on next week's lecture Environmental variables for new students -It takes some time to adapt to new education style -Being new to Canada, needing time to get settled, challenges related to culture shock -Too busy with work and do not have enough time to study Traditional live lecture Benefit -Undistracted focused time -Peer pressure to keep up with the learning -Students can ask questions immediately Challenges / barriers -Time constraints in the two-hour class (e.g., students have to be able to type fast to follow along) -Limited opportunity to ask questions during class due to the amount of content to be covered in two hours -The absence of content repetition -Typing proficiency affects student's ability to follow along

Please upload any images that will help to showcase your project.

By submitting, I consent to uploading my ARC Fund final report to the Langara Institutional Repository (The LalR). **True**

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