Connectional Research: Lab-to-World Impact

GENERAL INFORMATION

Course #	**Neur 710**
Section #	**001**
Term	**Fall**
Year	**2019**
Course pre-requisite(s)	**1 year of full-time graduate work in a lab.**
Course co-requisite(s)	**None**
Course schedule (day and time of class)	**Fridays, 1-4pm (Except Oct 11th, Nov 8th, Nov 22nd, and Nov 29th, when 9am-12pm)**
Number of credits:	**3 credits**
Course location:	**Room 210/11 of McIntyre** **Exceptions: Oct 11, Nov 8, and Nov 22nd → Room 206/7; Nov 29th → Room 208/9 , all in McIntyre Medical Building**

INSTRUCTOR INFORMATION

Name and Title:	**Reza Farivar, PhD. Assistant Professor, Ophthalmology**
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Telephone number for office appointments	**514-934-1934, ext. 35913**
Office hours for students	**Mondays, 1-2pm**
Office location	**Montreal General Hospital, L7.213**

TA Information

Name	TBD
E-mail	
Telephone number for office appointments	
Office hours for students	
Office location	

COURSE OVERVIEW

The course aims to provide both conceptual and hands-on training in socially impactful academic research, with an emphasis on connectional (lab-to-world) research. Through targeted exercises, individual and team tasks, and lectures, students will be exposed to many concepts in lab knowledge inventory, ideation and idea refinement,

compelling communication, ethnographic research of stakeholders, and training on policy development, education program creation, services, or products as ways of connecting lab knowledge to the outside world. At the end of the project, the students will each have a complete proposal ready to for a connectional research project of 2-3 year duration, with a plan for testing their proposed approach against current standards.

COURSE DESCRIPTION

You have worked in a lab for at least a year (Masters level training can count IF you are planning to transfer to PhD), and you want to extend your impact to the outside world. Through individual and team tasks, you will develop a full proposal that, when executed, will mean an effective attempt at connecting a development—a technique, tool, or discovery—from your lab to the world. The proposal will be empirically-focused, with a goal of defining testable questions and hypotheses about your connectional idea.

But effective connectional research—generating and testing hypotheses about how to connect lab knowledge to the world—requires far more than a proposal. It requires development of creative thinking skill to enable a re-imagination of what your lab work means. Compelling communication demands being able to convey ideas simply and persuasively, and testing them for these qualities to filter the good ideas out of the unworkable ones. Crucially, getting things from the lab out to the world requires a much greater appreciation for what the "world" wants—analyzing and understanding demands of specific stakeholders, preparing effective communication targeted to this group, and getting partners and collaborators to "buy-in" to your idea.

These are the ambitious goals of this course: to teach and practice creative re-thinking; to energize innovative problem solving; to enable persuasive communication; to foster an understanding of groups and stakeholders and their problems; to identify and engage partners and collaborators; all in service of planning an effective connection of a technique, tool, or discovery from the lab to the world.

INSTRUCTIONAL METHOD

The course will be largely based on lab work, but will include lectures, individual and team exercises, as well as many meetings with potential partners and collaborators.

The entire philosophy for the course is through concept learning and verifying learning through "concept play"—which involves running a lot of little experiments, some being as simple as "I wonder if these people will care about my idea". A first step is to actually catalog all the concepts in a lab and rate how well you think you know the concept (can you talk about it? If not, you don't know it!). You will enlist the help of your lab mates and even your PI.

COURSE CONTENT

CLASS 1: INTRODUCTION TO CONNECTIONAL RESEARCH

Lecture: What *is* connectional research? How does it differ from the fundamental or translational research? What are the methods and tools that can be used to carry out this research? This class will introduce the core concepts of connectional research—research that aims to create knowledge which connects a concept space (i.e., knowledge within a lab) to that of a target stakeholder. This hypothesis-driven approach requires an understanding of both concept spaces, and hypotheses on how to link the different concept spaces together. In this class, we will also introduce the core concepts of compelling communications, which will facilitate the ideation process. Students will practice compelling communication of their ideas with their team.

Assignment: students should each have prepared a concept inventory for their lab. During the class, they will create an encompassing concept map and share it with their team mates.

CLASS 2: INTRODUCTION TO EDUCATION PROGRAM AS CONNECTORS

Lecture: What are the different forms of education programs that can be initiated? How do such programs change knowledge or behavior in the target? How do you design a training program and verify it achieved your goal? This lecture will introduce the basics of pedagogical theories, and specifically learner-focused teaching. We will review some of the ways that training or education programs work, their method of funding and how evaluations affect learning.

Assignment: Students will generate three educational ideas from their concept inventories, outlining the concepts, the target they envision, and the ways in which the concepts will be taught and evaluated.

CLASS 3: EDUCATION PROGRAMS AS CONNECTORS, CONT'D

Working in teams, you will critique each other's ideas and help to refine it. You will be introduced to qualitative research and ethnography, and you will map out the populations that you will study to test your idea for your education program.

Assignment: Students will take their top idea (as decided by their team and themselves) and test their hypotheses regarding the target populations by carrying out meetings and ethnographic work, and documenting discrepancies between their hypotheses and the data collected from their targets. They will submit a short proposal of their idea of an educational program generated from their lab concepts.

CLASS 4: SERVICES AS CONNECTORS

Lecture: We review how a service works as a connector, the intimate relationship between education programs and service provision, and the many ways that a catalogue of services can act to impact society using lab-based knowledge. To better grasp the type of service, students will advance their practice of ethnographic and qualitative research, aiming to explain and predict how their target population would interact with their service.

Assignment: Students will generate three service ideas from their concept inventories, outlining the concepts, the target they envision, and the ways in which their concept connections will be evaluated.

CLASS 5: SERVICES AS CONNECTORS, CONT'D

Team work: the team will critique each other's ideas and ask questions to test the ethnographic links. Students will then take their top idea (as in Class 3) and create a proposal outlining their target concepts and target populations, and how the service will help the targets connect with and use the lab concepts, including a method of testing this new connectional knowledge.

CLASS 6: PRODUCTS AS CONNECTORS

Lecture; How do products come to connect lab knowledge to new stakeholders? We begin by first reviewing scientific devices, and then review concepts around product design that combine with ethnographic research to help refine the type of product that will help stakeholders connect with lab-based knowledge.

Assignment: students will generate three product ideas from their concept inventories, carry out ethnographic research on the target population to make predictions of necessary product designs, and carry out elemental product design steps (i.e., sketches and diagrams).

CLASS 7: PRODUCTS AS CONNECTORS CONT'D

Team: Students will work together to critique one-another's proposal, starting with the concept inventory, the ethnographic data, and finally the product design. The goal is to refine and finalize one idea that will then result in a submitted proposal.

CLASS 8: POLICY AND REGULATION AS CONNECTORS

Lecture: most of us don't appreciate it enough, but a lot of our knowledge can help guide effective policy, whether at the level of government or policies inside a company. In this lecture, we will review some examples of how knowledge has impacted public policy. Students will create three proposals on their policy, outlining how it leverages knowledge from their lab, which target population is ideal for their policy, and how they would relate the material and create connectional knowledge.

Team work: a continuation of the previous class, the students will work in teams to evaluate each other's data from interviews with policy makers and target stakeholders to better understand how connectional knowledge may be created for their lab material.

CLASS 9: TERM PROEJCT, PART 1

By now, you will have selected a main topic or proposal that you would like to further develop for your full term proposal. In the next four classes, we will be focus on iteratively refining, researching and enhancing your proposal.

CLASS 10: TERM PROJECT, PART 2

A brief lecture will be given on how intellectual property works, how and where to obtain funding,

CLASS 11: TERM PROJECT, PART 3

A review of your proposal with a focus on narrative structure and emotional capture.

CLASS 12: TERM PROJECT, PART 4

A careful review of how you plan to test your connectional research hypotheses.

CLASS 13: LAB-TO-WORLD PRESENTATIONS

In a 3-minute bullet-style presentations, you will present your idea to the class and the invited guests.

EVALUATION

30% of your grade will come from class participation, including participation in the blind peer-review system. 20% of your grade will come from your effort and advancement on your class assignments (again, judged on peer-review and instructor evaluations). 50% of your grade will depend on your final full proposal.

ACCESSIBILITY

As the instructor of this course I endeavor to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me and the Office for Students with Disabilities, 514-398-6009."

MCGILL POLICY STATEMENTS

LANGUAGE OF SUBMISSION:

"In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded. This does not apply to courses in which acquiring proficiency in a language is one of the objectives."

« Conformément à la Charte des droits de l'étudiant de l'Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté (sauf dans le cas des cours dont l'un des objets est la maîtrise d'une langue). »

ACADEMIC INTEGRITY:

"McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures"