RES 502 - Interdisciplinary Case Analysis and Research Design

201 (Doctoral level)

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Place: Tuesdays 9am-12pm, AERL 419 (aka Fishbowl)

Purpose in Brief

This is a course in which students use their own research and research conducted by others to learn how sustainability questions are turned into researchable topics and what research methods (qualitative and quantitative), rules of evidence and strategies of proposal development and subsequent research are used to arrive at answers.

The goal of this course is to foster literacy in research methods and bring about familiarity with good research design and proposal development. The end product goal of the course is a defensible proposal for your own research program.

Course Description

In this course, students will learn how inchoate ideas and topics of interest are turned into researchable topics that are **concrete**, **well-defined**, and **precise**, and what research methods (qualitative and quantitative), rules of evidence, and strategies of proposal development are used to arrive at answers. Topics include research design, presentation, theory, research questions and policy relevance.

The course will begin with the evaluation of published papers and successfully funded proposals. The remaining portions of the course involve an explicit focus on students' own research designs, which will develop in stages and be iteratively peer-assessed. By the end of the class, students will complete a solid, review-ready proposal for their own thesis work.

Given the wide range of incoming academic and professional backgrounds among the students, peer mentoring will be used within the class to help bolster knowledge of and familiarity with qualitative and quantitative methods. This is an interactive seminar, where robust and consistent participation and attendance is expected of all students. Each week, the class may include lecture, discussions, group problem solving, design workshops, identifications of core ideas, scenario-based learning, and proposal evaluations. Weekly readings will be available on Connect.

Textbook: Bhattacherjee, Anol. (2012). Social Science Research: Principles, Methods, and Practices, 2nd edition. http://scholarcommons.usf.edu/cgi/viewcontent.cgi?article=1002&context=oa_textbooks

Learning Objectives and Outcomes

In this course, students will do the following:

1. Develop the necessary skill set to evaluate the quality of multiple examples of disciplinary and interdisciplinary research, including its logical underpinnings, its methodological approach, and the nature of evidence and theory employed.
2. Gain a concrete appreciation, through analysis of proposals, research publications and interaction with other researchers, of how different researchers approach a domain, including question formation, evidence collection and argumentation.
3. Learn the tools to critique, assess, and evaluate the effectiveness of different research strategies, data sources, and representation of ideas for different target journals.
4. Develop your own proposal with the aim of seeking funding, passing the proposal stage of your research.
5. Learn to design projects in interdisciplinary contexts.
6. Learn to communicate your proposal ideas critically and creatively to specialist and non-specialist audiences, including the art of proposing work either as against or in contribution to that which has been already achieved in a given field.
7. Upon completion of the course, students will be poised to operate with methodological literacy in interdisciplinary contexts and to convert this knowledge to the analysis of cases and the development of research designs through proposals.

Course Declarations

1. The course instructor and your peers in the course likely know little about your research area, so use them as non-expert reviewers for your proposal. This means that you need to explain assumptions and basic literature in your field. This is your opportunity to educate them about your research.
2. Involve your research supervisor. Although the course doesn't explicitly require your supervisor to read and provide feedback on your proposal, you should nonetheless check in with them regularly about your ideas as you develop your proposal.
3. Gain a basic understanding of social and natural sciences. Regardless of your background and previous training, it is beneficial to gain a basic understanding of how research works in social and natural sciences. Since this class relies heavily on group work and peer review, there are several ways to group people, and this needs to be determined by the instructor and the students. Here are a few ways to group students: (1) based on the same discipline (e.g., social science students in one group, and natural science students in another), (2) students with a natural science background wanting to incorporate social sciences methods into their research, and vice versa, or (3) based on the desire to collaborate with another colleague with shared interests and goals.
4. It's quite common that students produce a proposal at the end of the class and end up changing it or working on an entirely different proposal for their PhD work. What matters for this course is to gain the ability to write a solid proposal.

Course Policies

As per university requirements:

Attendance

Following university regulation, regular attendance is expected of students. Students who neglect their academic work and assignments may be excluded from the final examinations (note: there are no exams in this course). Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

The University accommodates students with disabilities who have registered with the Disability Resource Centre. The University accommodates students whose religious obligations conflict with attendance, submitting assignments, or completing scheduled assignments. Please let the instructor know in advance, preferably in the first week of class, if you will require any accommodation on these grounds. Students who plan to be absent for varsity athletics, family obligations, or other similar commitments, cannot assume they will be accommodated, and should discuss their commitments with the instructor before the drop date.

Late Assignments

This course is not intended to run or ruin your life. So when exceptional circumstances will prevent you from completing an assignment on time, you may request an extension and it will be granted where possible and appropriate. In the absence of a granted extension, a 5% reduction of grade will be assigned for each day an assignment is late beyond the required due date.

Academic Dishonesty

Please review the UBC Calendar "Academic regulations" for the university policy on cheating, plagiarism, and other forms of academic dishonesty.

Students should retain a copy of all submitted assignments (in case of loss) and should also retain all their marked assignments in case they wish to apply for a Review of Assigned Standing. Students have the right to view their marked examinations with their instructor, providing they apply to do so within a month of receiving their final grades. This review is for pedagogic purposes. The examination remains the property of the university.

Course Objectives by Week

Week 1 – Jan 3: Introduction: course expectations, structure, and content

Goals: Introduce every member in the class and their research interests/topics. Overview course structure, content, and expectations. Assign people to readings for next week

Week 2 – Jan 10: Shaping ideas into concrete investigations: Critical evaluation of published papers

Goals: Understand research as a process of ideas posed, challenged, and re-written by critically evaluating published papers

Readings:

1. Chapters 2 and 3 (mandatory) and 1 (optional) in: Bhattacherjee, Anol. 2012 Social Science Research: Principles, Methods, and Practices, 2ⁿᵈ edition.

2. One group of 2-3 students will be assigned to read and present each paper

2.1 *Asensio and Delmas 2015 Nonprice incentives and energy conservation*
http://www.pnas.org/content/112/6/E510.abstract

2.2 Hennes et al. 2016 Motivated recall in the service of the economic system: The case of anthropogenic climate change
http://psycnet.apa.org/journals/xge/145/6/755/

2.3 *Shepherd 2010 Mobilizing local knowledge and asserting culture*
http://www.jstor.org.ezproxy.library.ubc.ca/stable/10.1086/656424?seq=1 - page_scan_tab_contents

2.4 *Hautier et al. 2015 Anthropogenic environmental changes affect ecosystem stability via biodiversity*
http://science.sciencemag.org/content/348/6232/336

Assignment 1 (10%): For each group, identify hook or topic, research questions, methodologies, and to what extent they are driven by theoretical ideas or propositions, discuss strengths and weaknesses of the paper, and implications of the findings. Present a summary of the paper in 30mins in class.

Week 3 – Jan 17: What is theory in social and natural sciences?

Goals:
- Think about what theory is and isn't in social and natural sciences
- Theorize one construct through multiple disciplinary lens
- Explore modelling as theoretical or proposition science

Readings:

1. Chapter 4 in: Bhattacherjee, Anol. 2012 Social Science Research: Principles, Methods, and Practices, 2ⁿᵈ edition.

2. Newell et al. 2014 The psychology of environmental decisions
http://www.annualreviews.org/doi/abs/10.1146/annurev-environ-010713-094623

3. Larson et al. 2015 Understanding the multi-dimensional structure of pro-environmental behaviour
http://www.sciencedirect.com/science/article/pii/S0272494415300177

4. Steg et al. 2014 An integrated framework for encouraging pro-environmental Behaviour: The role of values, situational factors and goals
http://www.sciencedirect.com/science/article/pii/S027249441400005X

5. Oreskes 2003 The role of quantitative models in science
http://www.dpi.inpe.br/gilberto/cursos/cst-311/oreskes_role_models.pdf

Workshop I: Work in groups of 2-3 to prepare a definition of pro-environmental behavior for a broad audience, and express it in the form of a theory (construct) and variables (operationalization of the construct) expressed as a researchable question or hypothesis. Try to formalize your theory in a quantitative model.

Week 4 – Jan 21: What is a research proposal? A review of successful proposals

Goals: Unpack and review a set of proposals individually first, and then review these collectively – in panels like those struck by funding agencies

There are many strategies for writing a winning proposal but all depend on the elements listed below, be the proposal aimed at researching a new topic, solving a problem or developing new methods. These elements include but are not limited to:

(1) **A compelling hook.** You want any reviewer who reads your proposal to think "that's an interesting problem"! You need to convince the reviewers why your research is interesting and important.
(2) **A novel idea.** You need to demonstrate to a broad audience that the ideas in your proposal are new, necessary, and important.
(3) **A good understanding of the 'right' literatures.** You need to help the reviewers who might not be in your field understand the problem context. This is where you situate your research project in the broader literature.
(4) **A well-defined and crisp clear research question.** You need to pose the question that is succinct and clear, and answerable in the time proposed and through the methods you put forward.
(5) **Appropriate methods and sufficient data analyses.** You need to convincingly demonstrate what methods you will use, what type of data you need to collect, and what type of analyses you will conduct on your data.
(6) **Novel possible findings and important implications.** You need to outline possible findings from your project, what these findings mean for your field, and what implications they have.
(7) **Logical flow.** Your proposal should be a sequence of tight and logical arguments. You need to portray your proposal as a compelling narrative that sparks a curiosity that no one can resist.

Readings:

1. Chapter 5 in: Bhattacherjee, Anol. 2012 Social Science Research: Principles, Methods, and Practices, 2nd edition.

2. Four successful proposals (2 NSERC, 2 SSHRC)

Assignment 2 (10%): Each group of 2-3 students will read one proposal, present the proposal to the class, analyze and critique the proposal in terms of its strengths and weaknesses. Keep the 7 points above in mind while evaluating the proposal. When all groups have presented, we will evaluate all 4 proposals collectively as in a panel from grant agencies, to simulate how a grant panel decides funding for proposals.

Week 5 – Jan 30: What is your research question?

Goals:
• Create a novel, attractive, and compelling 'hook' (i.e., topic)?
• Define your research goals in a clear and concise manner
• Define the problem and frame it in a compelling manner
• Justify the importance and necessity of your research question

- Identify tractable and feasible questions
- Outline speculations, propositions, and hypotheses
- Anticipate what type of methods you will need to address your question

Assignment 3 (10%): Present in class a draft of your research question in one sentence in a compelling way. Identify one applicable theory or construct pertinent to your own field (using Bhattacherjee's definitions from week 3); define it for a broad audience, and express it as a researchable question or hypothesis within your own area of work. Also prepare a 20-second elevator pitch of you research question (what would you say when someone asks you what you are working on?). Your presentation will be evaluated by peers in the class and the instructor.

Week 6 – Feb 7: Why is it important? Outline literature review and problem context

Goals:
- Understand the difference between a diagnostic and a descriptive literature review
- Import theories from your own and other disciplines
- Identify your audience
- Identify the critical body of literature in which you contextualize your research question
- Identify propositions (central claims that the previous literatures have made)
- Identify a model study which you might reasonably emulate

Readings: You should select and review a minimum of 10 key papers linked to your proposed work

Assignment 4 (10%): Present a draft of your literature review in class with proper citations and references. Justify why these literatures are relevant for your project. Identify the problem context of your project. In reviewing the relevant literature, you might need to revise your research question. This is not yet your full 'literature review', but is instead an intermediate step to understand how to link your literature to your questions, which will in turn help 'frame' the literature review section in your draft and then final proposal. Your presentation will be evaluated by peers in the class and the instructor.

Here are some hypothetical examples of topics and claims:

Literature Name: Land Use Change [e.g., topic or keywords and one sentence on what literature addresses, e.g., Theories and Methods of Remote Sensing – literature that seeks to detect patterns or trends in land use change.]

Literature Claim: Satellite measurement techniques fail to capture low-level deforestation changes (e.g., those more subtle than clear cutting)

Literature Name: Governance [theories of good governance, which addresses principles of civic participation, environmental citizenship, and role of non-state actors in the emergence and critique of public policy.]

Literature Claim 1: Transparent decision-making does (or does not) lead to better governance
Literature Claim 2: Multi-stakeholder engagement can foster the transition to a post-carbon energy economy

Literature Name: Human Dimensions of Conservation [conservation has a history of multiple human rights abuses, and has consequently moved toward better consideration of the social consequences of parks, protected areas, and biosphere reserves.]

Literature Claim: Many new conservation initiatives find that conservation initiatives can produce both social and ecological wins, but often such claims are premises on 1 or 2 weak variables.

Week 7 – Feb 14: How to address it? Learn from your elders

Goals: Understand how a faculty or senior PhD student, whose work bears some relevance to your own, thinks about methods and operationalizations. The material for this work will be derived from your interview assignment, noted below.

Interview questions:

1. What are your primary research methods and how would you briefly describe these?

2. What kind of data or research materials do you work with – e.g., qualitative or quantitative, textual, primary or secondary sources, etc.?

3. How do you go about identifying and collecting data for your studies? What do you consider the hallmark of good practice for doing so in your field?

4. When viewing written work in your field, what do you look for in a paper so as to judge whether the empirical material behind the work is of good quality?

5. Similarly, what do you look for so as to understand whether the data analysis done is of good quality?

6. How do you evaluate whether the conclusions drawn or claims made in a study are sufficiently justified by the data?

Assignment 5 (10%): Interview mentor, supervisor or late career PhD student as approved by the instructor. Write up a summary (1 page) of your interview before the class. Explain what, for them, constitutes good methodological practice – meaning, good quality evidence or data, ideal methodological approaches (i.e., those they think meet the 'gold standard' in their field), and/or best practices regarding analysis of 'data' however defined. Interview questions that you may use but are not confined to are listed in week 8 of the syllabus. Be sure to schedule your interview well in advance. Your interview findings will be presented and discussed in class.

Week 8 – Feb 28: Methods and rules of evidence: What are your data and measurements?

Goals:
*   Define your methods based on your research question
*   Define the type of data you need and defend its legitimacy in reference to norms in your field
*   Explain how you would collect the data and what measurements you would use
*   Present your methods in a succinct and precise manner such that a non-expert can understand

Readings:

Everyone should read chapters 8 and 16 in Bhattacherjee, Anol. 2012 Social Science Research: Principles, Methods, and Practices, 2nd edition.

And then either:

A. If qualitative or interview based, chapters 11, 12 and 13
B. If quantitative, chapters 9 or 10 or approved alternates, and chapters 14 and 15

Assignment 6 (10%): Present your methods in class. Explain what type of data you need, defend and justify why you need these data to answer your research question, and explain how would collect the data and what measurements to use. Your presentation will be evaluated by peers in the class and the instructor.

Week 9 – Mar 7: What are your analyses and possible outcomes?

Goals:
- Identify the type of analyses you would do based on the data to be collected, defend the legitimacy of your analyses in reference to norms in your field, examples will be provided in class
- Explain what possible outcomes there will be from your analyses

Assignment 7 (10%): Present your proposed analyses in class. Defend the legitimacy of your analyses in reference to norms in your field, and explain the possible outcomes. Your presentation will be evaluated by peers in the class and the instructor.

Week 10 – Mar 14: What are the implications of your research?

Goals:
- Identify the theoretical and practical implications of your research project. This is specially critical because the granting agencies need to be sold on the importance of your research in order to provide funding. Justify the value of your research.

Assignment 8 (10%): Present the theoretical and practical implications of your research project in class. Your presentation will be evaluated by peers in the class and the instructor.

Week 11 – Mar 21: Uncertainty resolved: Open problem solving

Goals: Pull together all pieces into one coherent proposal. It is the one week where you get to come to class with any and all uncertainties as yet unsolved about how to piece together your proposal. We will have some small group and 1:1 problem solving as well as some demonstrations on how to knit the pieces of your work together.

Weeks 12 – 13: Mar 28 – Apr 4: Proposal Presentations

Assignment 9 (10%): In these two weeks, each student will present their full draft of the research proposal in class for 15-20 minutes with 15-20 minutes for feedback. One class colleague will take careful notes of all comments offered to provide the presenter. This is what is known as a proposal pitch and often occurs when seeking funding for larger projects – usually facing a group of people from the funding agency and a panel of peer reviewers who get to question assumptions made or ask clarifying questions. Your presentation will be evaluated by peers in the class and the instructor.

Apr 11: Final proposal due

Assignment 10 (10%): Final full proposal is due 12pm, April 11. The proposal should be no more than 10 pages single-spaced, including citations and references, with no more than 3 additional pages of appendix.

Assignment timeline and proportion of grade

- Assignment 1: in-class presentation of a published paper, Jan 10 ....10%
- Assignment 2: in-class presentation of a sample proposal, Jan 21 ....10%
- Assignment 3: in-class presentation of your research question, Jan 30...10%
- Assignment 4: in-class presentation of your literature review, Feb 7..10%
- Assignment 5: in-class presentation of your interview summary, Feb 14 ....10%
- Assignment 6: in-class presentation of your data needed, Feb 28 ....10%
- Assignment 7: in-class presentation of your analyses and outcomes, Mar 7 ....10%
- Assignment 8: in-class presentation of your implications, Mar 14 ....10%
- Assignment 9: in-class presentation of your full draft proposal, Mar 28-Apr 4 ....10%
- Assignment 10: submission of your final proposal, Apr 11 ....10%