Writing the research proposal: Chemistry 419/519

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http://www.humanities.ualberta.ca/WAC/
The writing process

Getting started

- Explore the assignment
- Make rough notes
- Pick a tentative topic

Getting feedback

- Make an appointment at the writing centre for later in the week
- Get feedback on your draft/revise

Revising

- Work on style and lower order concerns
- Proofread, consult checklist for assignment
Getting organized

- **Introduction and Context**: importance of the problem; strong statement of aim [thesis]
- **Background**: elaborate on the research area; give preliminary results (describe what has been done)
- **Research Plan**: Rationale; General objective & specific aims; Specific aim 1 (elaborated); Specific aim 2;
- **Significance**
- **References**: List all references you have cited in your text (page 4)
Invention ideas: originality

Writing is social: talk to others

1. Extrapolate from existing papers
2. Combine ideas from two existing papers in the area
3. Build on existing techniques—improve them
4. Apply a technique from one area to another area
5. Switch techniques while examining the same biological system
Possible topics: TB

- TB
Introduction

- Use the inverted funnel approach: start general, then move to specific aims of this research

2 billion TB carriers
Tests inaccurate
10 million new cases this year

TB can be cured
Drug resistance increasing
Background & Preliminary results

- Big questions in the field
- Hedge your claims: “most research in TB . . .”
- Refer to existing research to create a context for your work
- Narrow down from big picture to specific unanswered (before you) questions
- Make the argumentative move: “Although approach Y solved some problems with TB, the approach we propose here will extend diagnosis rates to over 90% accuracy”
Ex. [this study] will be a unique scholarly contribution as very few studies genuinely combine oral history and the documentary record.
Make the move

- Write a one sentence claim about your project—the general objective
Research plan

Introduction: restate general objective and specific aims

Rationale

Research Plan

Specific aim 1

Specific aim 2

Specific aim 3
Specific aim 1

- Expected outcomes (what will your experiments tell you?)
- Potential problems (brief)
- Alternative strategies (brief)
- Techniques (not too detailed)
- Timelines (in months)
Significance

- Additional implications of your work
Argumentative “moves”

- “moves” are like tacit questions that grant writers answer
- Moves are a way to organize the proposal
- Moves create a narrative
Narrative

“A problem exists of social and research importance (territory). Some research already exists, but there is also clearly an absence of research in a particular area (gap). The researcher(s) is/are well prepared (means) to address the problem (goal) by conducting the following study (methodology).”
Territory

• Research territory refers to current research issues or problems

• “Real world” territory refers to social problems or issues

• Connect the two territories: a real world problem exists for which a research area can propose a solution
Example

- “[this study] will also be of interest beyond the academic community. The project grows out of the initial steps taken by the office of the Treaty Relations Commission of Manitoba (TCRM). . . It is essential to know the history of agriculture in First Nations communities in order to understand what the barriers have been and how they may be removed.”
As a general class, stochastic imperfect information games with partial observability are among the hardest problems known in theoretical computer science. This class includes many problems that are easy to express but are computationally undecidable [20, 38].

In practice, writing a program to play a legal game of poker is trivial, but designing and implementing a competent poker player (for example, the strength of an intermediate human player) is a challenging task. Writing a program that also adapts smoothly to exploit each opponent’s particular playing style, betting patterns, biases and tendencies is a difficult learning problem.”

Goal

• States the aim, general objective, chief contribution of the study

• This move responds to the gap or problem identified in the proposal

• “My study seeks to address this void in the demographic literature . . .”
Example

- “The principal goal of my study is to address these and other related questions and to uncover the underlying social demographic and socioeconomic factors responsible for the recent fertility rise in Alberta.”
Objective strategies

- Nominalizations (a verb changed into a noun)
  - We investigated the problem to see . . .
  - A problem investigation showed . . .

Nominalizations remove agency, creating an objective tone.

They can improve conciseness.

**Warning**: Overuse of nominalizations can confuse and bog down a reader’s understanding.
Passive Voice

• Linguistic construction that places the object in the subject position
  • We investigated the problem (active voice)
  • The problem was investigated by us (passive voice)

• Create objectivity, improve conciseness

• Mitigate blame, emphasize processes over agents

• **Warning:** Overuse can make prose boring or difficult to process
Signposting

• Techniques that prove a framework or conceptual map for the document (headings, bulleted or numbered lists, etc.)

• Help to organize the information for the reader

• Help reader retrieve specific information later
Example of signposting

Research plan/Methodology

1. Rationale
2. Specific aims
3. Significance