Initiating an Experiment in the public service

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Chapter 1

Preface

This is a repository to house course materials related to module 2 of Government of Canada's Experimentation Course, `Initiating an Experiment`.

1.1 Prerequisites

An interest in experimentation and apetite for informed consumation of evidence. Additionally, being part of a team of knowledgeable partners with interests in experimentation with policies, programs, and services, helps with developing contexts.

1.2 Learning objectives

- Identify the steps needed before starting an experimental project
- Explain the steps involved when deciding to experiment
- Define the problems before running an experiment
- Design a research experiment
- Provide examples of Experimentation

1.3 Outline

Chapter	Title
1	Before initiating an experiment
2	Components of an experimental project
3	Mechanics of endorsement
4	Case study
5	References

Chapter 2

Experiment components

2.1 Endorsements

- executive support

2.2 Collaboration agreements

- team support

2.3 Funding models and budget targets

2.4 Past research and literature search

2.5 Defining relevant and specific questions

- context and significance

2.6 Project scoping and problem statement

- objectives and aims

2.7 Experimental design

- controlled experimentation

2.8 Project timelines and milestones

2.9 Communication matrix

- stakeholder consensus

Chapter 3

Decision to experiment

3.1 Deciding to experiment

- Do you need to experiment? Why or why not?
- Find a behaviour or object to test and think short term
- Keep it simple
- Start with a proof-of-concept test
- Have control and treatment groups (e.g. randomization)
- When results are in slice the data
- Try out of the box thinking
- Measure everything that matters
- Look for natural experiments

3.2 Steps involved in designing an experiment

3.2.1 Step 1: Choose a topic

- Ask yourself the following question: 1. What do I find interesting about the subject? 2. What is known about the subject? 3. What is missing and the gaps?

3.2.2 Step 2: Narrow the topic

- Ask yourself the following questions: 1. What do you need to know more about on the topic? 2. Are you interested in social, political, economic, gender, religious issues related to your topic? (General example) - Find a "slant" on your topic;
- Will the results reveal something new or unexpected?
- What is in scope and what is out of scope?
- Clearly define hypotheses and explicitly state research questions

3.2.3 Step 3: Find Resources

- Use the keywords you have compiled and use them to search for books in Library Catalogs or articles in online article databases.
- Team expertise

3.2.4 Step 4: Solicit feedback and collaboration

- Make sure the question is one that other people can get behind and support
- Establish collaboration agreements and executive buy-in
- Peer-review for clarity, scientific accuracy, and feasibility
- Does the team have the expertise required to complete the project? If not, who else needs to be on team

3.3 Experimental design cycle

- Problem statement
- Question
- Research
- Hypotheses (It….then…)
- Identify controls and experimental group as well as interventions/treatments
- A control group is a group of 'test' items in an experiment. The control group will be used to compare with the experimental group
- The control group doesn't get the treatment
- An experimental group is the group(s) of test items where only one change (called the experimental or independent variable) has been made
- The experimental group gets the treatment
- The experimental group may have dependent or independent variables
- Sample size
- Maximize sample size: the larger the number of test items the more accurate the estimate
- Use representative groups: the samples must reflect the natural variation in the population. Use random or systematic sampling to reduce inherent bias in data.
- Determine outcome measures and visualization of outcome
- Independent variable or the factor that is manipulated or changed in placed on x-axis when grouping
- Dependent variable or the factor that is being measured is placed on y-axis during grouping
- Identify sources of error
- Mind the constants: the conditions that are kept the same for control and experimental groups
- Not controlling for factors or parameters that are kept the same in both control and experimental groups can result in error
- Report back and adapt
- Data analysis

- Implement intervention and measure outcomes and impacts

Chapter 4

Mechanics of endoresement

4.1 requirements

- Use communication matrix to relay information to stakeholders/executive
- Importance: Why do we need to answer this scientific question now?
- Novelty: Has this question been answered? Has it been attempted?
- Impact: What's the risk, and what's the potential upside?
- Design: Is the design of the experiment sound? how?
- Qualifications: What makes this researcher/research uniquely qualified?

4.2 Communication matrix

- Establish a communication matrix
- Experiment status project updates to whom and how
- Foster a culture of experimentation in the organization Explain the business value of experimentation to decision-makers
- Establish accountabilities
- Frequency and content of communications
- Structural report updates

4.3 Code of conduct

- Ethical considerations
- Information sharing agreements and memorandums of understanding
- Identify situations where experimentations are appropriate and relevant
- Check Institutional Review Board (IRB) approval requirements prior to the launch of the experiment
- Perform privacy impact assessments
- Get ethics committee approvals

Chapter 5

Case study

- City of Vancouver Solution Lab's Principles of Experimentation (pg. 38), adapted from Nesta's Innovation Playbook, 2018
- Nesta's Competency Framework for Experimental Problem Solving (pg. 2)
- States of Change's Core Elements of Innovation Craft
- Tatyana Mamut's eight Innovation Elements (pg. 6)
- The Moment's Culture Scan
- Innovation Designer Capability Map