How to write a research plan

Antonella De Angeli, PhD
Prof. Human-Computer Interaction

Learning objectives

What is a research plan?
Understand key dimensions

How to evaluate a research plan?
Develop critical skills

Peer review – review - review
Provide and act on feedback

Engagement format

Interactive class activities: 6 hours

| Monday, January 11, 09:30–12:30 | Friday, January 15, 09:30–12:30 |

Individual work: 10 hours

Non-attending students are expected to watch the videos and do the exercise autonomously

Who are you --

- 1 minute introduction
  - Your name
  - Your Country and current location
  - What is your field of research
  - How do you feel

Research plan

- A structured narrative describing your research with regards to

  - What [are you doing]?
  - Why [are you doing it]?
  - How [are you doing it]?

What (is your research about)?

- Ground the work in context
  - Literature review: an organic, informative and critical essay organising and critically discussing the state of the art
  - Properly highlight your contribution
    - "Previous research has addressed two main themes."
    - "According to (REF), previous research has addressed two main themes"
  - Be careful not to drown in the reading – identify key papers based on relevance, validity, importance

What (is your research about)

- Master your subject:
  - Research epistemology: the theory of knowledge, with regards to its methods, validity, and scope. It distinguishes justified belief from opinion.
  - Disciplinary conventions
  - Key theories and concepts
  - Methodology, methods, techniques, tools
  - Writing style

Cohesive narrative

- All parts are to be logically and coherently connected to each other, so that even not technical readers can follow your ideas.
- Accordingly, you must use linking words and phrases to join clauses, sentences and paragraphs together. Linking words can be used for
  - Adding information
  - Giving examples
  - Summarising and drawing conclusions
  - Sequencing ideas
  - Giving a reason
  - Giving a result
  - Similarity or comparison
  - Emphasis
  - Details
  - Suggestion

Why (is your proposal important)?

- Identify the research challenge
  - There is a <u>gap</u> and addressing it would contribute to…..
    - Explicitly state the contribution of your research to existing knowledge
  - There are <u>antagonist proposals</u>…..
    - Describe them and state your unique contribution
  - <u>Nobody has looked</u> at this specific space
    - Why?
    - Has anything recently changed to make this space more relevant/accessible/important?
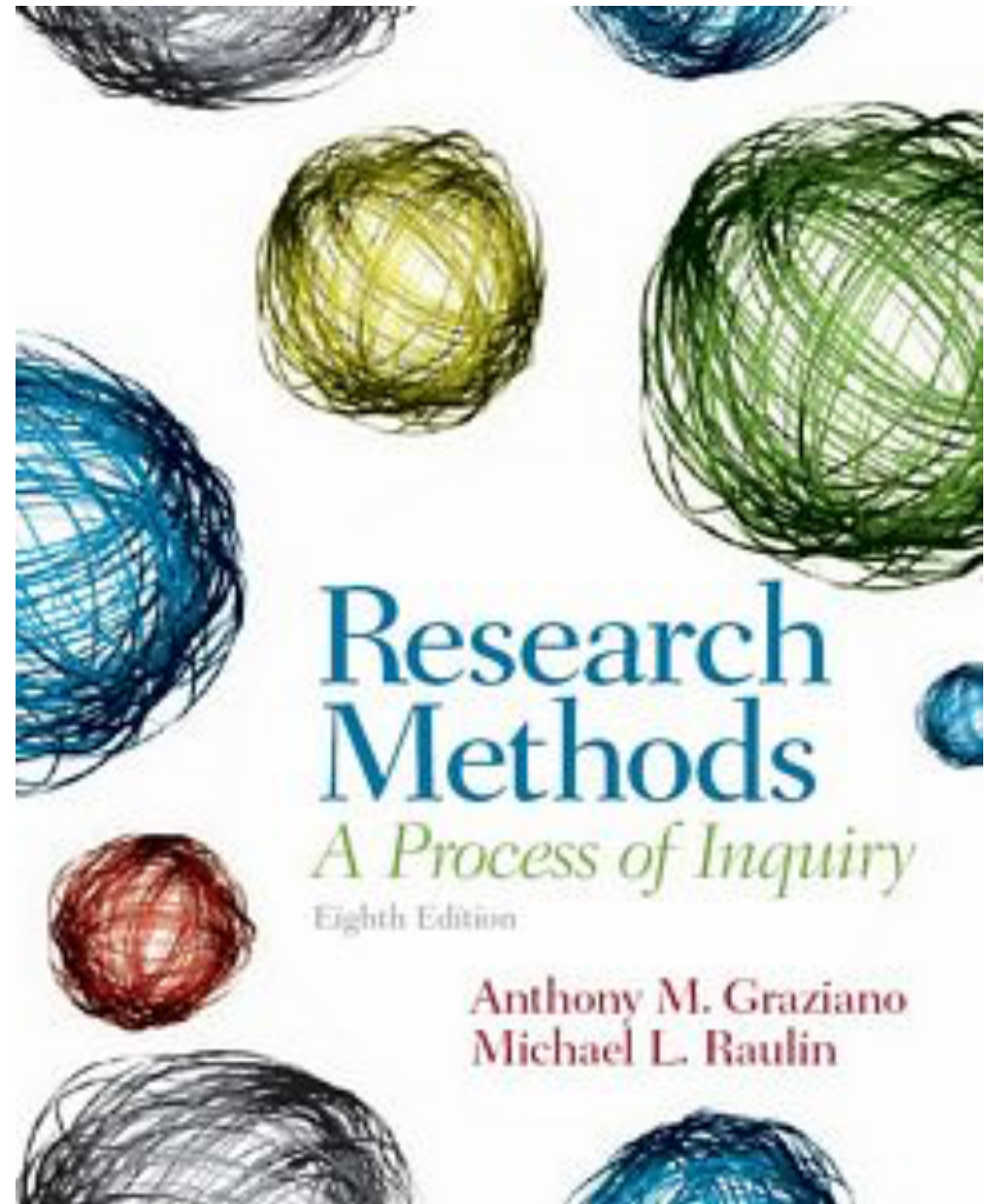
How (will you do it)?

- Methodology
- Methods
- Techniques
- Expected results

- Project gantt – time and resource planning

- Critique
- Constant enquiry

How: Systematic search for knowledge

- What distinguish scientific research from other forms of research is the emphasis on using integrated **empirical** and **rational** processes
    - gaining information through sensory experiences and reasoning
    - analysing and interpreting the information through methods and theories

Research as a process of inquiry

The essence of modern science is the way of thinking, the disciplined way in which questions are posed and answered.

It is the logical process and demands for evidence, and NOT the technologies, that lies at the centre of science.

It is an intellectual process, and its ultimate goal is to understand the natural universe.

Scientific research

- The structured and creative process of formulating specific questions and finding answers in order to understand a phenomenon better

Asking questions

- A question is one side of an idea
- On the other side there is is an unknown
  - A POTENTIAL ANSWER
- Asking questions is creative – it is the exercise of curiosity
- Asking good research questions require the specification of answering methods

Approach to questioning

- Disciplined – rigorous – scientific

- Researchers are pervasive **sceptics**; they constantly challenge existing accepted wisdom

- May be undesired

- Knowledge is always incomplete – it is always tentative
- Your Research Questions are likely to be modified/refined/sharpened in the next future

Approach to questioning

- Clarity
- Focus
- Complexity
- Feasibility

Example

How should social networking sites address the harm they cause?

Clarity

- How should **social networking** sites address the **harm they cause**?

- What action should **Facebook** take to protect users' **personal information and privacy**?
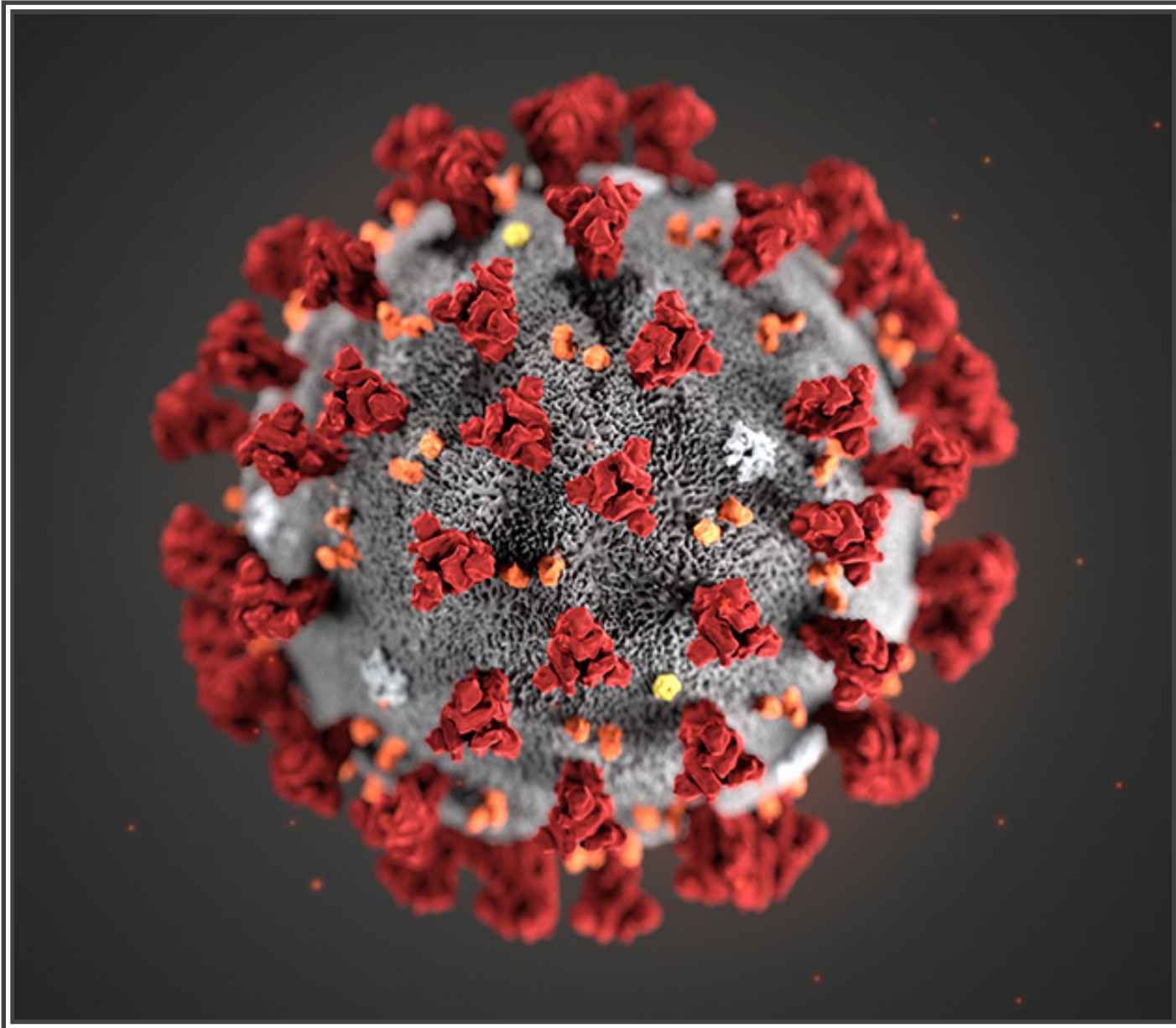
Example

What is the effect on the environment from global warming?

Focus

- *What is the **effect** on the **environment** from **global warming**?*

- *What is **the most significant** effect of **glacial melting** on the lives of **polar bears in Antarctica**?*

Example

- What role does technology play on the fight against coronavirus?

Focus

- What role does technology play on the fight against coronavirus?

- What effect does location tracking have on the behaviour of older people during the covid time?

Rework this question

- Does the US or Italy have a better healthcare system?

Focus + Clarity

- Does the US or Italy have a better healthcare system?

- How do the US and Italy compare in health outcomes and patient satisfaction among low-income people with chronic illnesses?

Complexity

- Has there been an increase in homelessness in San Francisco in the past ten years?

Complexity

- Has there been an increase in homelessness in San Francisco in the past ten years?

- How have economic, political and social factors affected patterns of homelessness in San Francisco over the past ten years?

- https://www.scribbr.com/dissertation-writing-roadmap/research-question-examples/

Scientific research - stages

- Setting the context – What? And Why?
- Posing a question – What?
- Developing procedures to answer the question - How
- Planning for and making appropriate intervention
- Rationally interpreting the intervention
- Proposing future research directions

A project plan must have

- Clear success criteria
  - Is the project good or bad?
- Gantt chart: Time planning
  - Are all required activities planned?
- Risk analysis
  - What can go wrong?
- Contingency plan
  - How do I minimise risk?

Gantt Chart

- Split your work in key tasks
  - Literature review
  - Learning (mandatory courses, winter/summer schools, conferences)
  - Coding
  - Testing
  - Writing (workshops, conferences, journals, thesis)
- Plan when and how these activities are going to happen
- Set up deliverable - milestones

Critical points

- Time estimate
  - Did you book any holiday?
  - Have you factored in training time?
  - Do you have any buffer?
- How many concurrent WPs do you have?
  - How well do you copy with parallel tasks?
  - Are there any external contingencies you do not have control on?
- Did you plan intense writing periods?
  - Parallel tasks will be harmed
  - Your final thesis will be improved

Writing

AS A SCIENTIST, YOU ARE A PROFESSIONAL WRITER

Joshua Shimel, Writing Science, p. 4

IT IS THE AUTHOR'S JOB TO MAKE THE READER'S JOB EASY

p. 5

Write a compelling story

- Tips to become a better writer
  - Rewrite, rewrite, rewrite
  - Get feedback from others
  - Read other writers and analyze what they do
  - Read books about writing
  - Keep reading your work (from the beginning to the end and in paper format) and rewrite, rewrite, rewrite

Key points

- A project proposal details the "what, why and how"
- Research is a process of enquiry
- Good RQs are clear, focused and complex
- A project plan includes quality criteria, time planning, risk analysis, contingency plan
- Make it beautiful

Homework 1 – 5 hours

- Prepare a draft by Friday 15 of January at 9.30 (Max 1000 words)
  - What –
    - Concise literature review (key readings) grounding the proposal – identify 3 key readings which are instrumental to your work
  - Why –
    - State the importance of your work with respect to the key readings identified in phase 1
  - How --
    - Research questions - write 3 research questions
    - Identify a method you will use to answer them and justify it
    - Prepare a project gant chart for the next 4 years

Homework 2 – 5 hours

- Prepare a proposal by Friday 22 of January (Max 1000 words) – revise your previous draft based on feedback obtained during class discussion
  - What –
    - Concise literature review (key readings) grounding the proposal – identify 3 key readings which are instrumental to your work
  - Why –
    - State the importance of your work with respect to the key readings identified in phase 1
  - How --
    - Research question - write 3 research questions
    - Identify a method you will use to answer them and justify it
    - Prepare a project gant chart for the next 3 years

Preparation tips

- Print and read it on paper (annotate with a pen)
- Read it out load (do you understand?)
- Focus on Research questions – clarity, focus, complexity
- Literature review (identify 3 keys references and explain why)
- Focus on project plan (is it feasible?)
- Style: how does your paper read (is it elegant?) How could you improve it?