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CS7CS6: Research and Innovation Methods

2021-2022

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Excerpt From the assignment sheet

Individually submit the following

- a. Reflection on the process and outputs of the team work. (approx. 250 words)
 - b. Critique of the research described in the dissertation assigned to your group. Based on lecture notes, learning from the group assignment processes and marking scheme for your dissertation, each student should determine the categories for critique. (max 500 words)
 - c. Reflection on the process and outputs of the individual work. (approx 250 words)
8. For your individual MSc research project, submit a research plan captured in a set of 6 slides providing the following information
- i. research canvas (as per template given in class)
 - ii. motivation statement (approx. 150 words)
 - iii. list of at least 7 references which support your research idea, method and motivation
 - iv. research project Gantt chart
 - v. an explanation of whether or not you require to get ethical approval for your research.
 - vi. list technical and research skills you have or hope to develop to carry out your research project.

Examples from previous years available on Blackboard.

Student Name:	Student ID:	Stream:	Supervisor Name:
1. Research Question/Aim			
2. Research Objectives	3. Approach/Method to achieve objectives		
Research Canvas			
4. Evaluation			
5. Contribution of your research project.			

In addition to the Research Canvas include the following 5 items in your research plan

Item	Description
1. Motivation Statement	Text that describes why you are motivated to answer your research question. (approx. 150 words).
2. Gantt Chart	The gantt chart should indicate when you are going to carry out the various steps of your research.
3. Skills list	List both the technical and research skills you intend to develop during your research.
4. Reference List	At least 7 selected References. Together, these 7 references should support your motivation, approach/method and evaluation. Use your preferred referencing style.
5. Ethics statement:	Indicate by saying yes or no if you need to make an ethics application. Provide a reason(s) for your decision.

CS7CS6 — Literature to Support the research Plan

Use literature to

1. Support **your motivation** for answering the research question. Use data to support/give context to the motivation e.g. X amount of people in Ireland have a hearing difficulty, X amount of images are reported on in the health service each year, X amount of polls on politicians before elections have been unreliable....
2. Provide **definitions** of concepts, terms used in your question e.g. improve, quality, efficiency, medical images, social media, action games- Make sure that every term in your question is defined.
3. Back up The **method** you are choosing to answer your question e.g. examples of how others have answered question of your type in your domain.
4. Provide some **relevant** background material on the state of the art and historical context and how your questions fits into this context (be mindful about how concepts change over time)
5. Describe **particular work** that you are building on, if relevant e.g. previous project, specific experiment, specific paper.

Choose the papers carefully to fit in with what you propose to do. Think of your references as a collective and have a good balance in the collective (sources, purpose for inclusion, stakeholder perspectives, contemporary/historical)

CS7CS6 – Common Phases of Research Process

Phase	Goal	Possible Outputs include
Idea-Generating Phase	The goal of this phase is to have chosen a research area of interest based on personal experience, published work of others, ideas mentioned by others in future work sections of papers and dissertations.	Research Plan Research Proposal
Problem Definition Phase/ Background	The goal of this phase is to have one or more questions(that is answerable) based on others work and your own ideas. You may also be investigating background information on tools/technologies.	Ethics approval application Interview questions
Procedures-Design Phase	The goal of this phase is to have a plan of what methods you will use to answer your research question in an ethical fashion, with your available resources and skills and based on how others answer questions of your type and within a research framework.	Questionnaires Focus Groups Questions
Observation Phase/ Action phase	The goal here is to conduct some primary research which involves doing something practical-prototyping, managing/processing data, testing, evaluating, designing etc.	Experiment design Presentation
Data Analysis Phase	The goal here is to analyse the data you have collected in a way that allows you to answer your question.	Paper
Interpretation Phase	The goal of this phase is to place the findings from the literature and your primary research together in a way that answers the research question you asked.	Dissertation
Communication Phase/ Ongoing	The goal here is to present in a formal or informal way, 1)what you have done, 2)your motivation for doing it, 3)how you did it, 4)how it fits in with others work, 5)your findings, 6) limitations and 7)possible future work.	

The idea generation
Problem definition

CS7CS6—Developing **Your** Research Question/Aim

1. **Start a research diary**

- Document any questions that come to mind
- Write observations/reflections
- Record decisions and actions

2. **Consider possible questions**

- Choose an area of interest
- Look at previous dissertations and consider any suggestions the authors have included in the future work section.
- Collaborate with others about your idea and be open to questioning and being questioned- socialise your idea.
- Look at calls for papers on conference sites and for journals- these are indicative of what is of interest to the community.
- Consider what the funding agencies in your area are interested in funding at the moment.

3. **Read literature about your area of interest**

- See if you can spot any gaps in the knowledge about the subject, the methods, the contexts.
- Can you bring a number of ideas together in an innovative way?
- Reflect and appraise what you have read- use it to inform decisions about what to read/do next.
- Reflect on how papers are written and formatted and how references are used.

4. **Consider (Scope/Skills/Audience)**

- How you are going to answer your question?
- When you are going to do the activities to allow you to answer your question?
- How will you communicate/disseminate your work?
- How would you like your work to be cited?

This is usually an iterative process!

CS7CS6 — Developing a Research Question

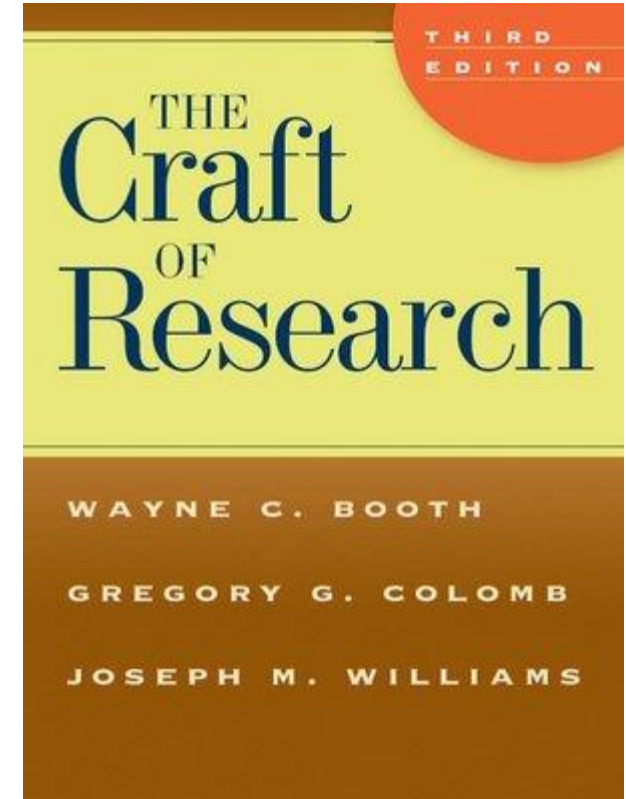
3.4.1 Step 1: Name Your Topic

If you are beginning a project with only a topic and maybe the glimmerings of a good question or two, start by naming your project:

I am trying to learn about (working on, studying) _____.

Fill in the blank with your topic, using some of those nouns derived from verbs:

I am studying the *causes* of the *disappearance* of large North American mammals . . .

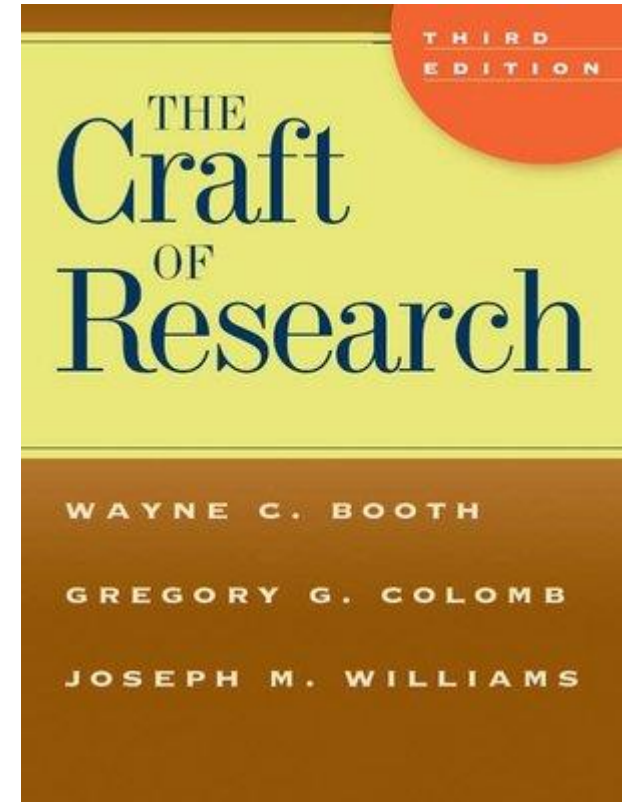


CS7CS6 — Developing a Research Question

3.4.2 Step 2: Add an Indirect Question

Add an indirect question that indicates what you do not know or understand about your topic:

1. I am studying the causes of the disappearance of large North American mammals
2. **because I want to find out whether they were hunted to extinction . . .**

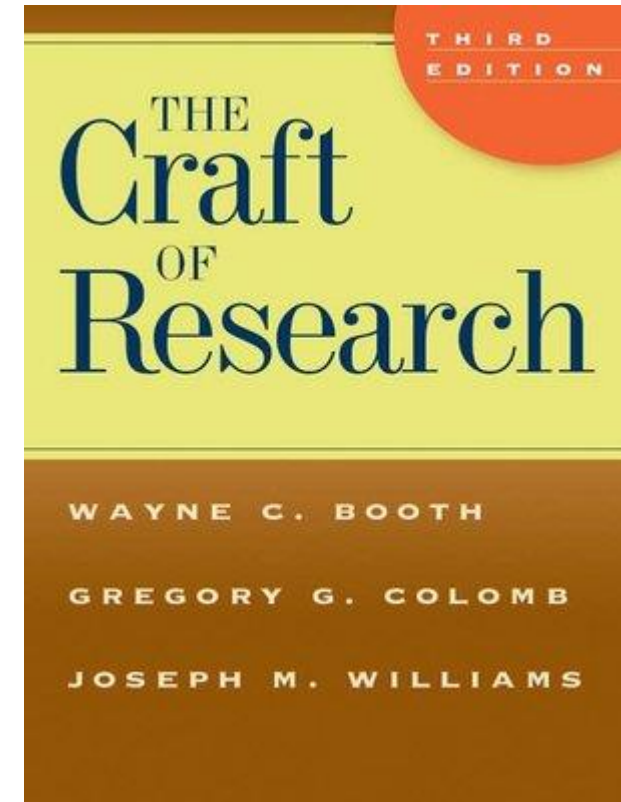


CS7CS6 — Developing a Research Question

3.4.3 Step 3: Answer *So What?* by Motivating Your Question

This step tells you whether your question might interest not just you but others. To do that, add a second indirect question that explains why you asked your first question. Introduce this second implied question with *in order to help my reader understand how, why, or whether*:

1. I am studying the causes of the disappearance of large North American mammals
2. because I want to find out whether the earliest peoples hunted them to extinction
3. **in order to help my reader understand whether native peoples lived in harmony with nature or helped destroy it.**



CS7CS6 –Scoping a research question.

Take a moment and consider ways in which the scope of a research question could be Determined and then reduced or increased as appropriate.

- Determine resources/skills required to answer the question
- Determine what resources/skills are available
- Partnership with your supervisor.....
- Map out the steps involved in answering the question- Can the steps be sensibly grouped into phases?
- Can you place the work in a particular context that reduces the scope e.g. Technical context, Use context, business context, population context, geographical context?



Objectives

Research Objectives are statements of what you want to achieve.

Action Verbs are used to specify Research objectives e.g. Understand, Determine, Verify, Describe, Compare, Analyse.

They are not moving targets- They should be derived from the Research Aim/Question.

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That's All Folks
Thank You for
Listening

