

Research Method and Report Writing

Lecture 1: How to Define a Research Project

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What is Research?

How to Find A Question?

Make Your Topic Manageable

What is Research?

- ▶ Research starts with a question and looking for a fact to answer it.



- ▶ Not all questions are equally good and worth to research.
- ▶ Which question worth to research?

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- ▶ Not all questions are equally good and worth to research.
- ▶ Which question worth to research?
- ▶ The proposed question by an engineer should lead to a solution of a problem in his/her field of expertise
- ▶ Experienced researchers know that before looking for the answers they must convince others
 - ▶ why their question was worth asking
 - ▶ how its answer helps us understand some bigger issue or solving a problem

Three Kinds of Questions That Researchers Ask

1. Conceptual Questions: What Should We Think?

- ▶ The most common question in academic work
- ▶ A question is conceptual when your answer to **So what?** doesn't tell readers what to do, but helps them understand some issue:
 - ▶ I am working on the topic of X,
 - ▶ because I want to find out how/why/whether Y, (So what if you do?)
 - ▶ so that I can help others understand how/why/whether Z.

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2. Practical Questions: What Should We Do?

- ▶ This is usually common in business and industrial environments
- ▶ A practical question is a question that when your answer to **So what?** tells readers what to do to change or fix some troublesome or at least improvable situation
 - ▶ I am working on the topic of X,
 - ▶ because I want to find out Y, (So what if you do?)
 - ▶ so that I can tell readers what to do to fix/improve Z

Three Kinds of Questions That Researchers Ask

3. **Applied Questions: What Must We Understand before We Know What to Do?**
 - ▶ Sometimes we know we must do something to solve a practical problem
 - ▶ but before we can know what that is, we must do research to understand the problem better. We can call that kind of research applied.
 - ▶ In otherworld, the third step raises a question whose answer is not the solution to a practical problem, but only a step toward it.

How to Find A Question in Your Topic

- ▶ Research and its reporting are never straightforward.
- ▶ You may require to look ahead to others or revisit an earlier one.
- ▶ You may require to change topics when you search for more data , perhaps even discover a new question as you revise.
- ▶ "Research is looping, messy, and unpredictable". But it's manageable if you have a plan.
- ▶ First step is finding a question worth answering

How to Find A Question in Your Topic

- ▶ **Study and expend your knowledge**
 - ▶ surf the internet
 - ▶ ebooks
 - ▶ elibraries
 - ▶ homepage of experts in your field and their research labs
 - ▶ follow up the events and news.
 - ▶ read articles and books in your field
 - ▶ watch films and videos
 - ▶ Talk to experts in your field
 - ▶ Take part to Conferences and talks
- ▶ **Think creatively and critically**
 - ▶ Think outside the box!



How to Find A Question in Your Topic

- ▶ Keep asking yourself critical questions
 - ▶ Why?
 - ▶ So what?
 - ▶ How it can be improved?
- ▶ You can pick any topic appropriate to your field by ask these questions:
 - ▶ What topics do you already know something about? You can learn more.
 - ▶ What would you like to know more about?
 - ▶ What issues in your field have you debated with others, then found that you couldn't back up your views with good reasons and evidence?
- ▶ In industrial projects some specific problem is posed by industry to solve.

Next: Make Your Topic Manageable

- ▶ Think about all available resources you have to find the solutions and make a list
- ▶ Investigate the risks
- ▶ Think of initial ideas for solution
- ▶ Consult with experts and make a team if it is required
- ▶ Motivate your topic by asking the following questions
 - ▶ How does your topic fit into a larger story?
 - ▶ How does your topic or approach to solve compare to and contrast with other topics or approaches like it?
 - ▶ How would things be different if your topic never existed, disappeared, or were put into a new context?
 - ▶ How has your topic changed through time?