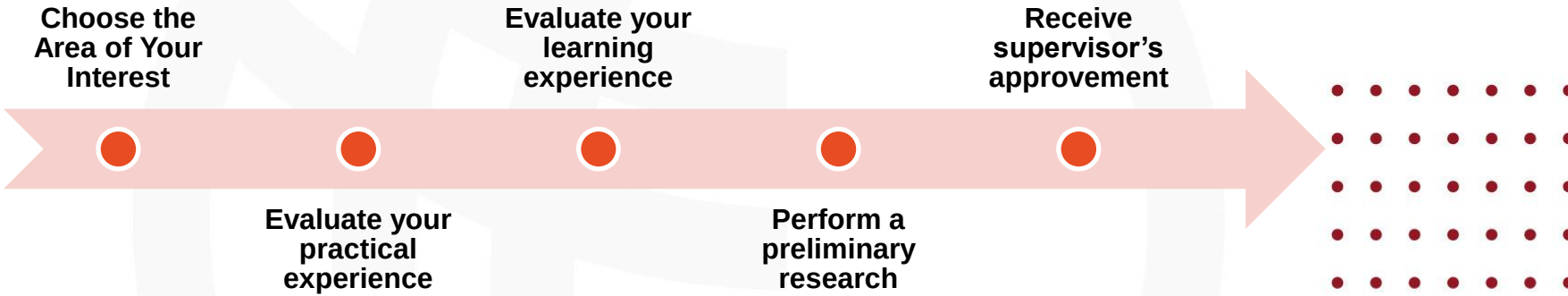
Research Methodology for PhDs

GBSB GLOBAL
BUSINESS SCHOOL

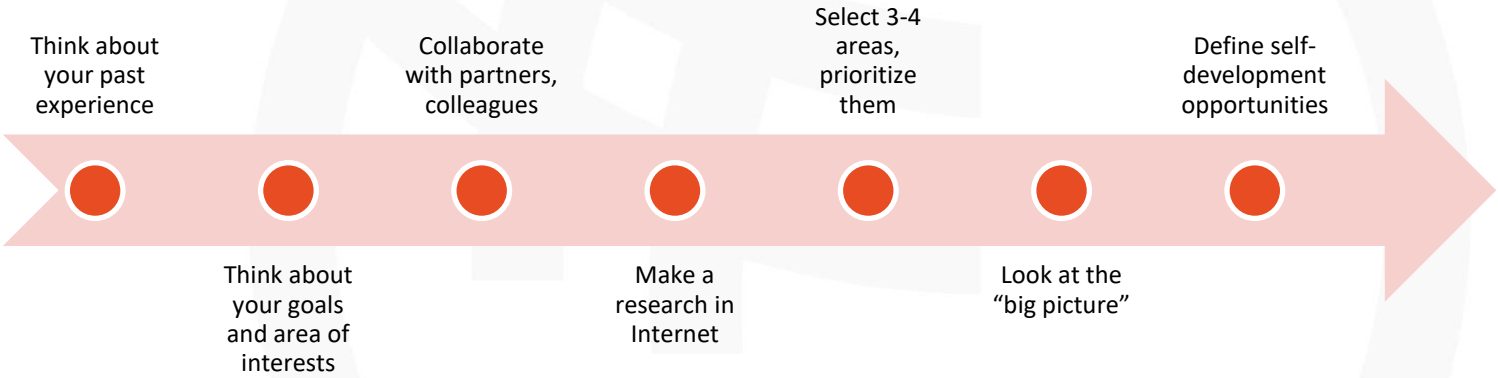
Session 3 Topics

- -Defining Research problems rules and algorithm of identifying problems for research

Start Planning



MAKE A RESEARCH TO DEFINE THE AREA



Maximize Self-development

Such personal development might include:

- Improving personal time management.
- Gaining access to respondents.
- Interviewing respondents.
- Speaking to an audience.
- Persuading people to cooperate.
- Dealing with uncertainty about data.

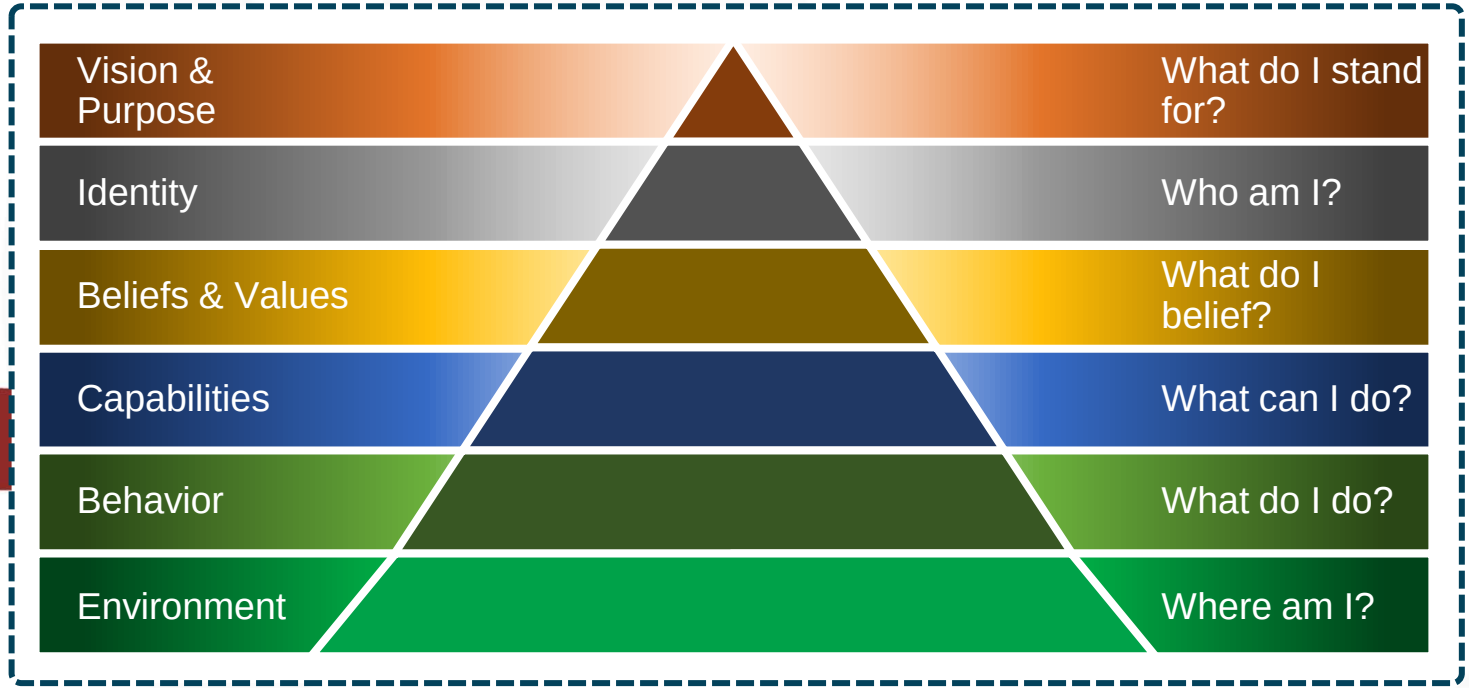
“Soft” Considerations

personality – who you are and what you would like to do in the research. In other words, the research approach needs to suit you and your work. The additional note on personality here is the need to develop yourself through your relationship with your supervisor. You will need to learn skills such as, for example, clarity, polite assertiveness, conviction of your beliefs, listening skills and social situation ‘reading’ skills. Linked to this it is possible to add political awareness – academic settings are known for often having politics with which you may need to occasionally contend. The potential list is extensive, and much of this wider development base can be undertaken only as a function of your progressive experiences.

Bateson Pyramid

People can act and think at different levels, as shown in the following figure.

The effect of each level is to organize and direct the information to the next (lower) level.



Meeting Academic Requirements

Check if your topic is capable of being linked to the appropriate academic theory

incorporate the use of academic journals (many of which are now online), which tend to be more topical

Avoid often changeable or “fashionable” theories.

(Example – HR management)

Personal Examples

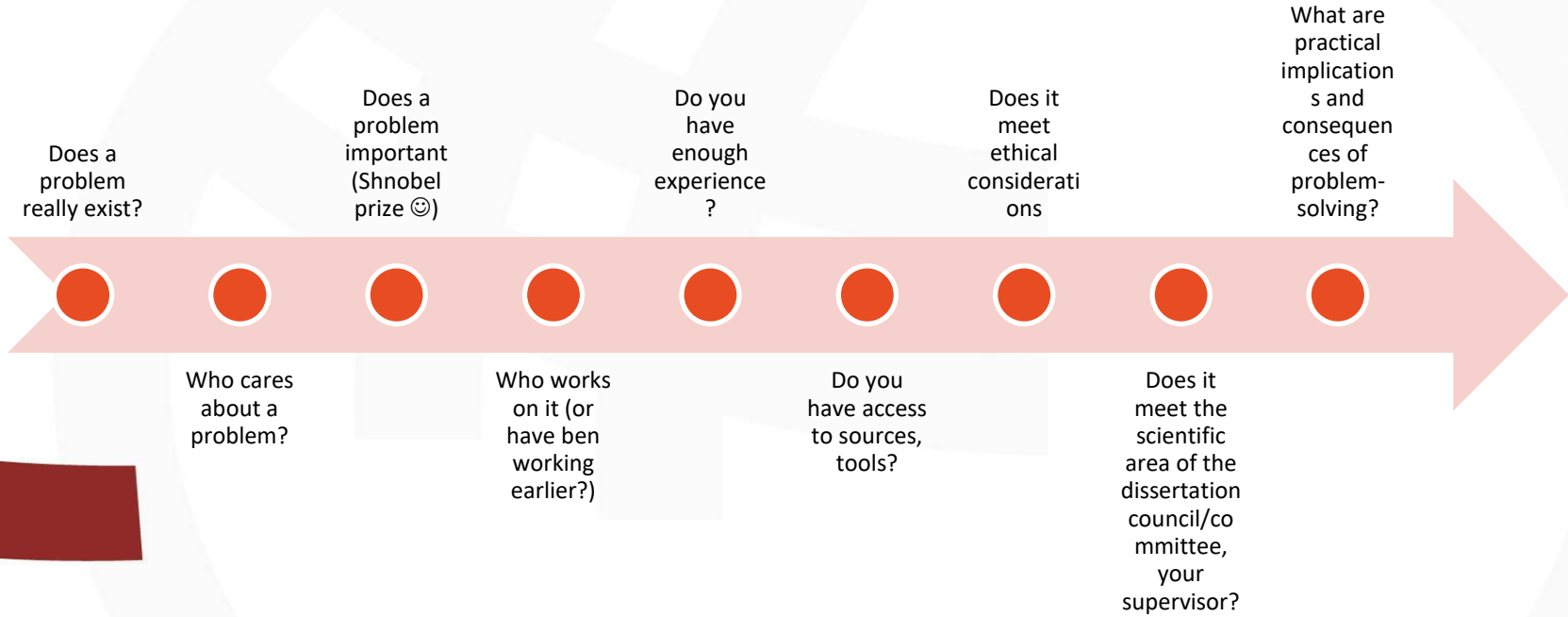
Ph.D. Research in Control in Technical Systems area

- Supervisor's scientific specialization
- Previous practical experience, including student's
- Current Job on a project
- Tribute to my Granny

Dr. Sci. dissertation in System analysis

- My own interest in Fuzzy logic
- A lot of practical applications, including patents
- Political considerations for University and by the supervisor
- My family desire for me reaching Dr. Sci ☺

“Algorithm” for Identifying a Research Problem



Session 3-2 Topics

- -Defining research problems

Research Problem Definition

A research problem is a statement about an area of concern, a condition to be improved, a difficulty to be eliminated, or a troubling question that exists in scholarly literature, in theory, or in practice that points to the need for meaningful understanding and deliberate investigation.

Research Problem Types

- Theoretical
- Applied
- Action-oriented

https://researcher.life/blog/article/what-is-a-research-problem-types-and-examples/

Defining a Research Problem/Topic

Inspiring for you personally

Actual

Meeting SMART principles –

- Specific
- Measurable
- Achievable
- Relevant
- Time-bounded

Perspective

Improving your position

Characteristics of a Research Problem

Novel:
An ideal research problem introduces a fresh perspective, offering something new to the existing body of knowledge. It should contribute original insights and address unresolved matters or essential knowledge.

Significant:
A problem should hold significance in terms of its potential impact on theory, practice, policy, or the understanding of a particular phenomenon. It should be relevant to the field of study, addressing a gap in knowledge, a practical concern, or a theoretical dilemma that holds significance.

Feasible:
A practical research problem allows for the formulation of hypotheses and the design of research methodologies. A feasible research problem is one that can realistically be investigated given the available resources, time, and expertise. It should not be too broad or too narrow to explore effectively, and should be measurable in terms of its variables and outcomes. It should be amenable to investigation through empirical research methods, such as data collection and analysis, to arrive at meaningful conclusions A practical research problem considers budgetary and time constraints, as well as limitations of the problem.

Clear and specific:
A well-defined research problem is clear and specific, leaving no room for ambiguity; it should be easily understandable and precisely articulated. Ensuring specificity in the problem ensures that it is focused, addresses a distinct aspect of the broader topic and is not vague.

Rooted in evidence:
A good research problem leans on trustworthy evidence and data, while dismissing unverifiable information. It must also consider ethical guidelines, ensuring the well-being and rights of any individuals or groups involved in the study.

https://researcher.life/blog/article/what-is-a-research-problem-types-and-examples/

Structured Problem-solving

The problem statement provides the context and constraints within which the solution must operate.

It defines the inputs and outputs of the problem, as well as any additional requirements or constraints.

A clear understanding of the problem statement helps you avoid misunderstandings and ensures that your solution addresses the problem as intended.

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The “Bucket’ Approach

Do not start from a scratch!

Have “a bucket”, in which you put potentially helpful

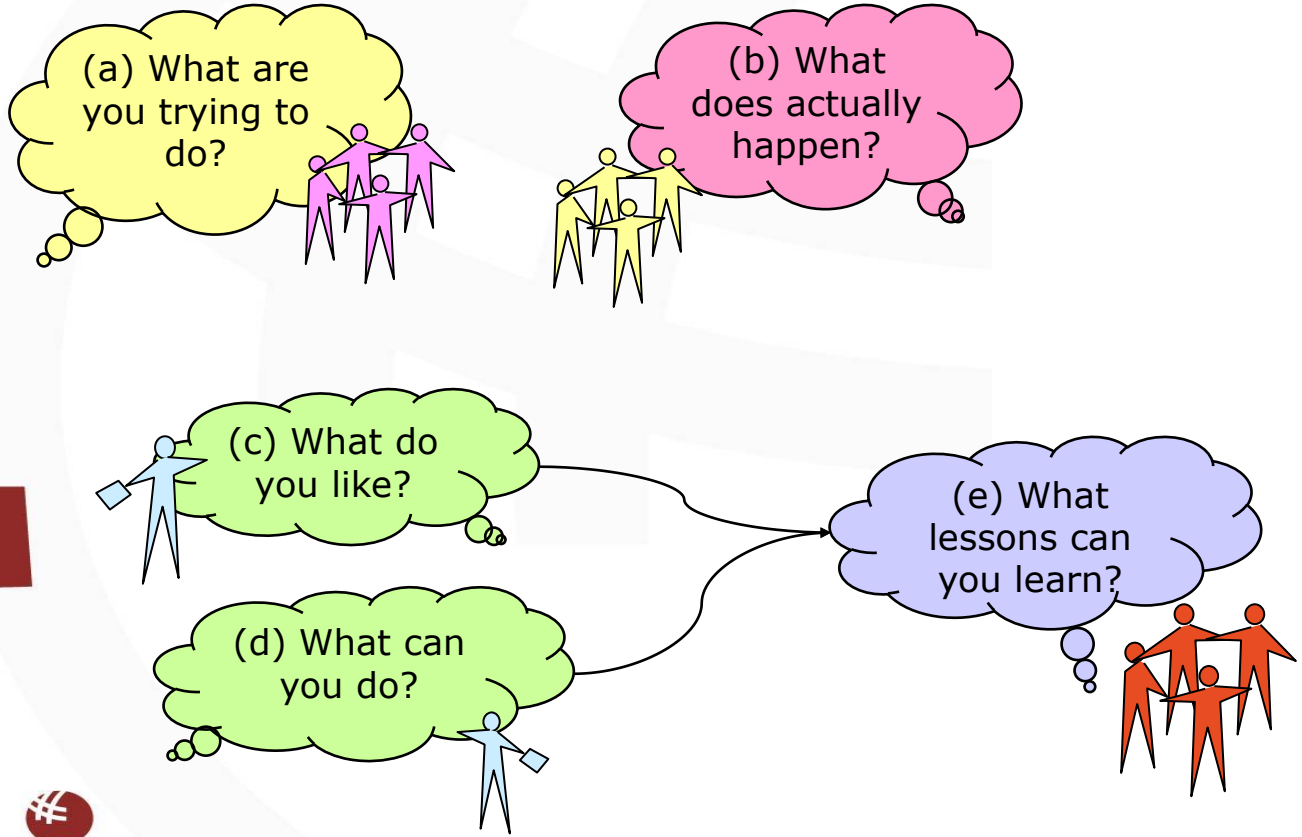
- links,
- articles,
- books.

Organize a kind of your own knowledge base

Potential tools for a “bucket” –

- MS OneNote,
- Google Keep
- Obsidian
- Evernote
- Bear

The Selection Process



Importance of Understanding the Problem Statement

The problem statement provides the context and constraints within which the solution must operate.

It defines the inputs and outputs of the problem, as well as any additional requirements or constraints.

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Narrow Down the Topic & the Title

Define your strong sides

Define the minimal/optimal academic Ph.D.requirements

Define possible/optimal workload

Identify the dissertation committee academic scope

Differentiate/Decompose a broad topic by (for example)

- - Location
- - Subject
- - Time
- - focus groups
- -Longitude
- -Scale
- - … (not limited to)

Techniques for Breaking Down Complex Problems:

Complex problems can often be broken down into smaller, more manageable subproblems.

Techniques such as divide and conquer, dynamic programming, and recursion can be used to break down complex problems into smaller, more manageable parts.

Breaking down a problem into smaller parts can help you understand the problem better and make it easier to design an algorithm to solve it.

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Identifying Inputs and Outputs

The problem statement will typically specify the inputs and outputs of the problem.

Inputs are the data or information that the algorithm will use to solve the problem.

Outputs are the results or solutions that the algorithm will produce.

Identifying the inputs and outputs of the problem is important because it helps you understand what information you need to solve the problem and what information you need to produce as a result.

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Identifying Bottlenecks and Optimizing the Approach

Once you have analyzed the time and space complexity of the topic/problem, you can identify any bottlenecks.

Finding ways to optimize – i.e., to reduce the time or space complexity of the problem, such as using a more efficient data structure or algorithm, or narrowing it down.

Optimizing the approach can help improve the performance of your work and make it more efficient and winning.

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Check Access to Sources

- Literature
- Organizations
- Historical data
- Sensitive information
  - GDPR
  - SOX
  - Other regulations
- People
  - Physically
  - Virtually
- Locations
- Can you minimize disruption/inconvenience?

The purpose of a problem statement

Introduce the reader to the importance of the topic being studied. The reader is oriented to the significance of the study and the research questions or hypotheses to follow.

Places the problem into a particular context that defines the parameters of what is to be investigated.

Provides the framework for reporting the results and indicates what is probably necessary to conduct the study and explain how the findings will present this information.

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The problem statements should possess the following attributes

- Clarity and precision [a well-written statement does not make sweeping generalizations and irresponsible statements],
- Identification of what would be studied, while avoiding the use of value-laden words and terms,
- Identification of an overarching question and key factors or variables,
- Identification of key concepts and terms,
- Articulation of the study's boundaries or parameters,
- Some generalizability in regards to applicability and bringing results into general use,
- Conveyance of the study's importance, benefits, and justification [regardless of the type of research, it is important to address the “so what” question by demonstrating that the research is not trivial],
- Does not have unnecessary jargon; and,
- Conveyance of more than the mere gathering of descriptive data providing only a snapshot of the issue or phenomenon under investigation

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Examples of Problem Statements

"Despite the growing adoption of renewable energy sources, the integration of large-scale solar photovoltaic (PV) systems into electricity grids remains a significant challenge due to the intermittent and variable nature of solar energy generation.

The lack of effective forecasting models to predict solar PV output has hindered the efficient management and integration of these systems into the grid.

This study aims to develop a robust machine learning-based forecasting model that can accurately predict solar PV generation at the utility scale, with the goal of improving the integration and reliability of solar energy within the power system."

Examples of Problem Statements

"The problem addressed in this research study is the lack of effective communication and collaboration among team members in a virtual work setting.

Despite the increasing prevalence of remote work, there is limited understanding of how to optimize communication channels and foster productive teamwork in such environments.

This problem leads to decreased efficiency, reduced employee satisfaction, and potential negative impacts on overall organizational performance.

Therefore, this study aims to investigate the factors that contribute to effective virtual team communication and collaboration, and propose strategies to improve these aspects in order to enhance virtual work outcomes."

Examples of Problem Statements

In the past ten years, the “gig economy” has become an increasingly important labor market segment.

People under 30 are now more likely to engage in freelance arrangements (rather than full-time jobs) than in the past.

Research on the reasons for and consequences of this shift has focused on objective measures of income, working hours, and employment conditions.

However, there has been little work exploring young people’s subjective experiences of the gig economy.

Recommended for read -
©https://infoguides.rit.edu/researchguide/problemstatement

Thank You!
Read the Recommended Readings
You're welcome with your discussions and questions in VLE!

Please note, that since the recordings are done, some Readings may become unavailable. Inform us immediately in VLE, so we can offer substitutions