Introduction to Research Project

Learning Objectives

To prepare the student for conducting an independent research project for discovering new knowledge and apply.

The student will develop an ability to

- Discover a research need
- Formulate research concepts
- Design research
- Gather data and process
- Present orally, by report and paper

Statement of research problem

- Define the problem: Distinguish the research problem from similar or related problems. The statement must be detailed enough to be clear about research need, purpose and aims.
- Identify the people and entities that are affected: narrow the statement of research to a specific group or a number of groups.
- Place the problem in a physical or geographical context.

Setting Research goals

- Identify goals from the topic and topic from the goals
- Focus and narrow the topic if necessary in order to make the scope of research useful and also manageable
- Clearly state research objectives and outcomes
- Use outcomes as a guide for planning and conducting research

Personal and professional aims

- Learning to explore by accessing and assessing source materials in the literature and real world scenarios
- Experience in responding to contradictory perspectives, reading, reviewing, interpreting and synthesising ideas
- Learning to use specialised techniques of analysis and writing formats
- Developing knowledge of the related subject areas

Literature review

- Provides background on research problem
- Identify what others have said or discovered
- Find out potential pitfalls in the chosen area
- Develop a bibliography, a file of relevant abstracts and written summaries with accurate references to sources
- Extract other's views, methods and findings, critically analyse, interpret and summarise with own comments and fine tune research objectives

State-of-the art survey

- Study Current practice
- Compare with up-to-date know how
- Compare successes and failures
- Identify gaps in technology, practices and knowhow
- Identify, refine and restate research problem

Developing hypothesis

- Derived from research questions
- A research hypothesis is a specific and falsifiable prediction regarding the relationship between two or more variables
- It is a relationship between an independent variable and a dependent variable
- It may be possible to develop more than one hypothesis

Feasibility

- Availability of information, data
- Availability of manpower
- Finding physical resources, funding
- Time plan
- Acceptability of research scope

Fact finding and data gathering

- Preliminary survey
- Literature reviews
  - Journals
  - The Internet
  - Other sources
- Questionnaires and surveys
- Interviews
- Experimentation (Primary data)
- Secondary data, data archives

Methodologies

- Experiments explore the strength of relationship between variables – correlational research
- Cause-and-effect studies based on manipulation of a given situation followed by the measurement of effects
- Descriptive research by surveys, interviews and natural observation

Selection of topic

- My own abilities
- My study area chosen
- Resources available
  - Time
  - Information & data
  - supervision
- Research approach to be taken
- Course requirements

Topic: Issues to consider

- Gaining access to organisations and people
- Availability of material, equipment, support software etc.
- Access to literature
- Techniques and skills you will need to master
- Usefulness or level of interest of topic for other interested parties

As a Project

- Opportunity to achieve outcomes
- Performing original work
- Integrates subject areas
- enhances personal experience
- Substantial contribution to knowledge

Size of write up

- Taught courses
  - 6000 to 10,000 words (30 to 40 pages)
- Research degree (Masters)
  - 30,000 to 40,000 words (150 to 200 pages)
- Research degree (Doctoral)
  - 60,000 to 80,000 words (300 to 400 pages)

This is only a rough guide !

Project report

A well structured convincing account of the study, the resolution of problem or the outcome of an experiment. The student is expected to test and validate a proposed model or method and critically comment upon the findings. It may be possible to extend the finding to other cases by attempting to generalise but this can be considered as scope for further work.

Dissertation

- Must show evidence of awareness of literature and state of the art.
- Should be an ordered, critical and reasoned exposition of knowledge gained through the student's efforts

Thesis

- The thesis must form a distinct contribution to the knowledge of the subject and afford evidence of originality, shown either by the discovery of new facts and/or by the exercise of independent critical power. A full bibliography and references will be required.

A good topic chosen

- Should be supported by right approach
- Allows to demonstrate your skills
- Gives you useful insights
- Captures your interest
- Gives you motivation
- Leads to the performance of good work
- Makes you enjoy the experience
- Leads you to a good mark and good employment in the end !

As research

- It is exploration and discovery
- Forms the core of your project work
- Something important is found or revealed
- Task is approached in a scholarly style
- Has methodical and conscious manner
- Findings are backed by appropriate evidence
- Doer becomes a researcher !

Research findings

- Have to be communicated
- Shows how to solve a class of problems
- Or shows causality of how and why
- Offers more general insights
- How we might think of certain things
- How other people think of certain things
- Or simply describes things and what goes on

Format for research proposal

- Title
- Background of research
- Literature review
- Research problem
- Objectives of research
- Expected outcomes (benefits and deliverables)
- Methodology
- Time plan
- References

Core Principles of Research Ethics

1. Integrity

- Researchers should be honest in all aspects of their research, including data collection, analysis, and reporting.
- Avoid fabrication, falsification, or misrepresentation of data.

2. Honesty and Transparency

- Researchers must accurately report their findings and acknowledge limitations.
- Plagiarism is strictly prohibited; proper citation of sources is necessary.

Core Principles of Research Ethics

3. Respect for Participants

- Obtain informed consent from participants before conducting research.
- Ensure voluntary participation and the right to withdraw at any time.

4. Confidentiality and Privacy

- Personal information of participants must be protected.
- Data should be anonymized or secured to prevent unauthorized access.

Core Principles of Research Ethics

5. Avoidance of Harm

- Research should not cause physical, psychological, or emotional harm.
- Assess potential risks and take necessary precautions.

6. Fairness and Justice

- Participants should be selected equitably without discrimination.
- Benefits and burdens of research should be fairly distributed.

Core Principles of Research Ethics

7. Informed Consent

- Participants must receive clear and comprehensive information about the study.
- Consent should be documented, and participants should understand their rights.

8. Data Management and Protection

- Store and handle research data securely.
- Ensure compliance with institutional and legal requirements.

Core Principles of Research Ethics

9. Ethical Approval

- Research involving human participants must receive approval from an ethics review board.
- Follow university and institutional ethics guidelines.

Need for time plan

- Manages personal work loads
- Coordinates activities
- Provides intermediate time targets
- Milestones for progress reviews
- Foresees time constraints
- Prevents last minute rush
- Leads to project success

In summary

- Research projects
  - Are an important part of your course as well as professional life
  - Provides you with valuable opportunities to
    - Test your knowledge
    - Improve your understanding of field
    - Master a number of skills
    - Develop ability to schedule and manage work
    - Satisfies your interests and curiosities
- There must be dissemination of knowledge

Task for this week

Form a group with four members

Finalize a research topic

Present your research problem