HOW TO WRITE RESEARCH PROPOSAL AND REPORT

CHOOSING A TOPIC / PROJECT AND WRITING A THESIS PROPOSAL

To introduce techniques for choosing an appropriate project, and to discuss the skills needed to write a satisfactory project proposal.

Goals

- Choose an appropriate project.
- Write a project proposal.
- Make effective decisions when choosing your project supervisor.

When choosing your project, keep these important principles in mind.

- You must be capable of doing the proposed project in the time available
- Choose a project that interests you
- Consider your personal development and choose a project that will assist you in your goals.

- Your project should have a serious purpose and a clear outcome that will benefit someone.
- Your project links suitably with your degree course
- Your project is of sufficient scope and quality to fit the requirements of your course
- The resources you require for your project are available or can be obtained; for example, oftware, hardware, a particular client, user or organisation

Where to get informations

- ***Lecturers'/departmental lists***
- ***Industrial projects***
- ***Past projects***
  - how you could develop thework further
- ***Talking with colleagues***
- ***Reading around subject areas***
  - you can often discover areas that authors have identified as requiring further research and development
- ***Clustering***

Clustering

- First, you should list keywords related to your topic area
- Second, once you have exhausted all the words and phrases you can think of, you cluster them into related groups and patterns.

Research Territory Maps (RTMs)

- Clustering can be used to develop *Research Territory Maps (RTMs)*, *Relevance Trees* and *Spider Diagrams*.
- RTM, sometimes called an *affinity diagram, shows how topics* relate to one another within your chosen field or fields of study

Additional considerations

- ***The 'so what?' test***
  - Ask yourself, Is the topic meaningful?
  - will it be of value to anybody?
  - What contribution will it make?

JUSTIFICATION !!!!!!

Additional considerations (conti…)

- ***What do you already know?***
- ***Ethical issues***
- **Data protection**

Data protection

- Data should only be used for the specific purpose for which it was gathered in the first place.
- Individuals have the right to access data held about them.
- Data may not be disclosed to third parties without permission of the individual.
- If personal data are kept, these data must be appropriately protected.
- Personal data should be kept for no longer than necessary.

Writing Proposal

- There are no universal standards for project proposals
- Mostly, it contains *implicit content and explicit content*.

Implicit content

- **Introduction to the subject area**
- **Current research in the field**
- **Identify a gapIdentify a gap**
- **Identify how your work fills the gap**
  - This will emphasise the *contribution your project* will make.
- **Identify risks and solutions**

Explicit sections

- ***Title***
- ***Introduction/background/overview***
- ***Related research***
- ***Methods***

TITLE Should be clear and concise. Try to avoid using acronyms if possible

- ‘Evaluation of soft systems methods as analysis tools in small software houses’;
- ‘Artificial neural networks for software development cost estimation’;
- ‘Development of process models for building graphical software tools’.

- TRY TO MAKE YOUR TITLE

Introduction

- **Background**
- ***Research problems***
- ***Research questions and hypotheses***
- ***Aim***
- ***Objectives.***
- ***Expected outcomes/deliverables***

Research problems

Research questions and hypotheses

Aims and objectives

- Aims identify at the highest level what it is you hope to achieve with your project – what you intend to achieve overall. An aim is a broad statement of intent that identifies your project's purpose.
- Objectives, on the other hand, identify specific, measurable achievementsthat build towards the ultimate aim of your project. They are more precise than aims

Aim

- Evaluate artificial intelligence techniques for modelling weather patterns

Objectives

- Identify and evaluate existing weather pattern modelling techniques.
- Identify artificial intelligence approaches suitable for modelling weather patterns.
- Design and develop at least three artificial intelligent systems for modelling weather patterns.
- Compare and contrast the developed systems with one another and existing
- approaches to modelling weather patterns.

EXRCISES

- MAKE YOUR OWN AIM AND OBJECTIVES BASED THE TITLE MADE

Expected outcomes/deliverables

This section of your proposal will identify precisely what you intend to submit at the end of the project

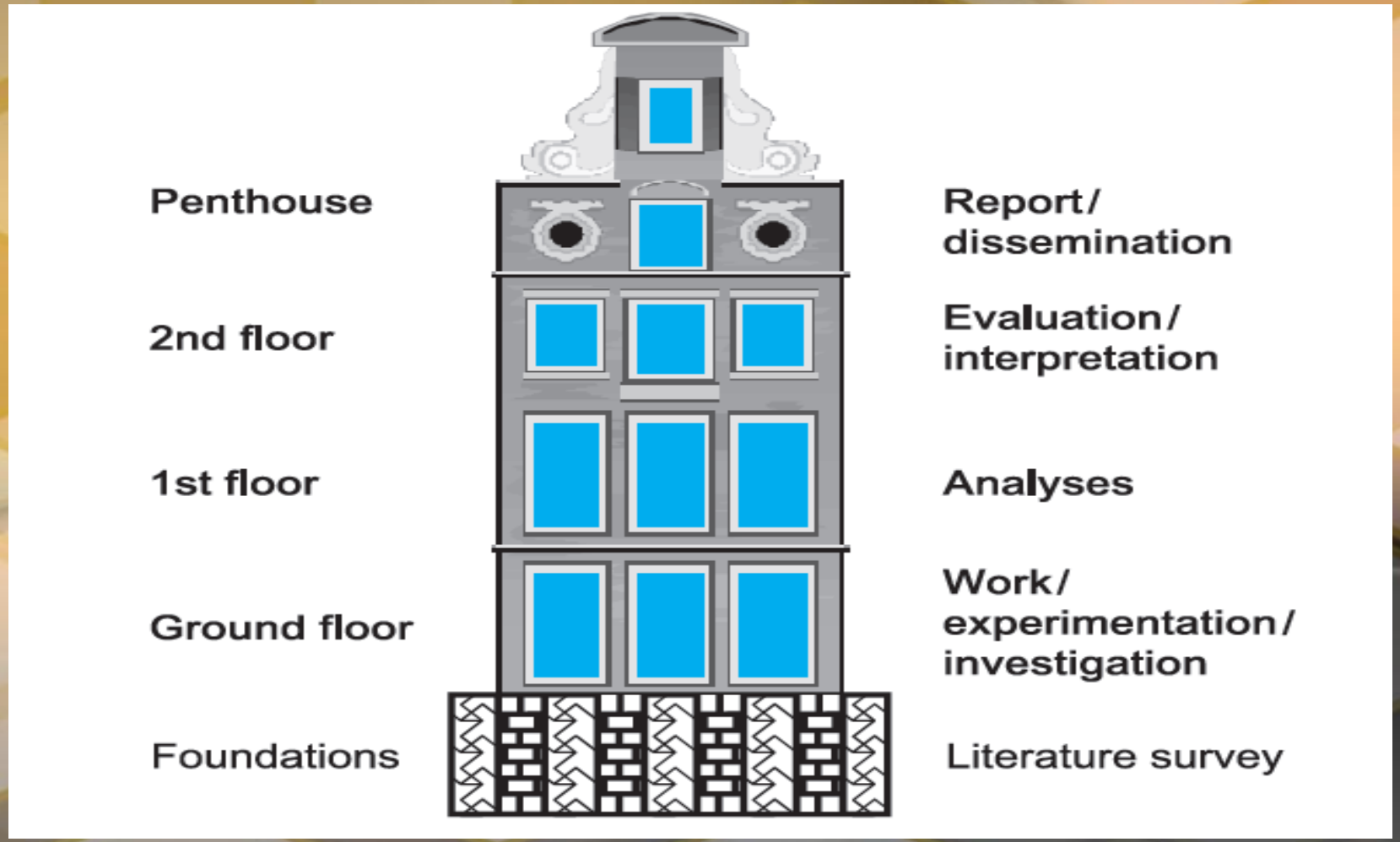
- a written report
- a piece of software, a prototype, or a test plan
- Journals
- Hak Paten

Related research

- This section identifies other work, publications and research related to your topic
- It will demonstrate that your project does not exist in an academic vacuum but relates to other research topics and fields of current interest.
- Demonstrate your understanding of your topic area, showing the reader that you are
- aware of what is currently happening in the field

A literature survey/related research serves a number of purposes

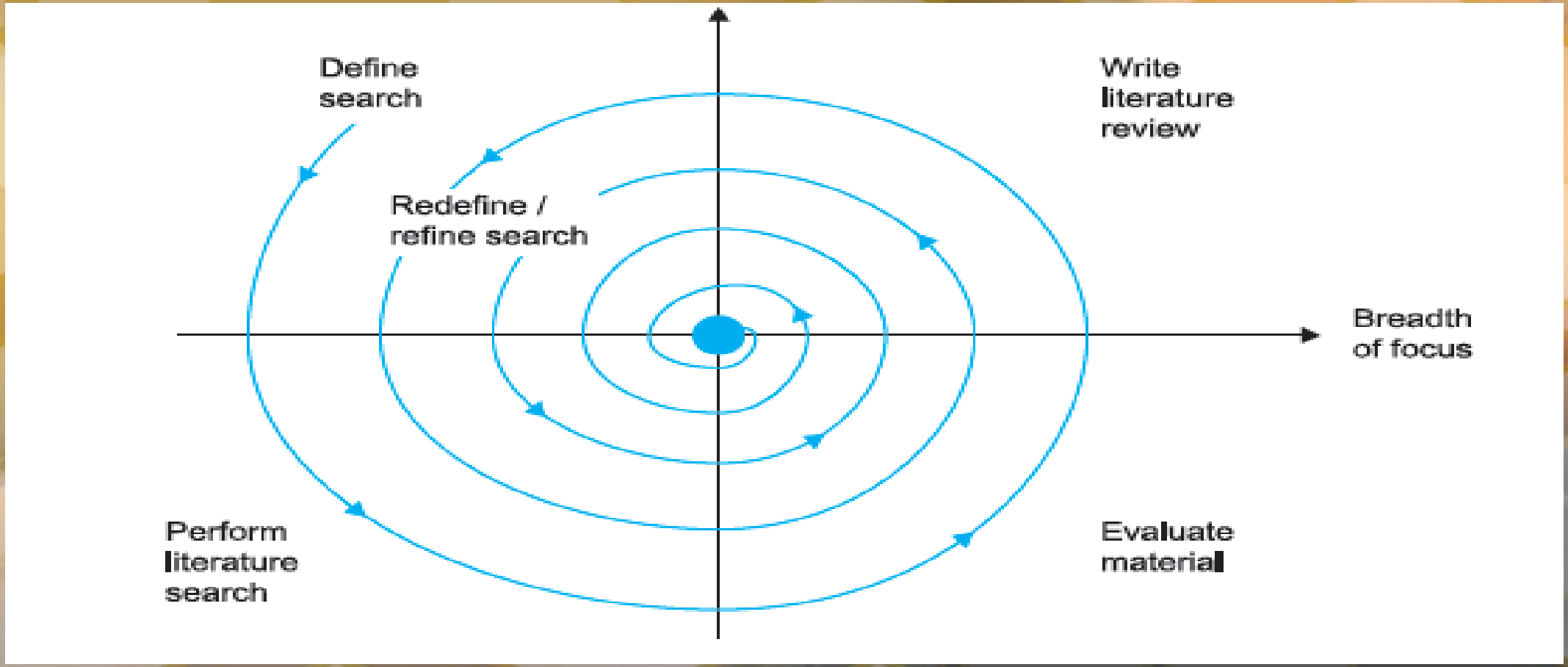
- It justifies your project
- It sets your project within context by discussing and critically evaluating past and current research in your area
- It provides other researchers with a starting point from which they can understand


Penthouse
2nd floor
1st floor
Ground floor
Foundations
Report/ dissemination
Evaluation/ interpretation
Analyses
Work/ experimentation/ investigation
Literature survey

The literature survey process

- *search and*
- *review*

The literature survey process



Literature searching

- literature search is a '*systematic gathering of published information relating to a subject*'

There are two golden rules when performing a literature search:

- Allow plenty of time
- Ensure that you make note of the full reference of any material you obtain
  - Books
  - Journals
  - Proceedings
  - CD/DVDs
  - Company Reports
  - Theses
  - Manuals
  - Software, Internet,

Internet

Some points that you should consider when evaluating the quality of material on the Internet :

- What is the purpose of the site, When was the site updated? How up-to-date is the material on the site? Is it still relevant?
- Is the site part of (or related to) an official organisation (a professional body, government department or academic institute or research group)?
- Are there any copyright issues associated with the material? Will you be able to use the material without breaching copyright?
- Is there an author for the material? Is the author qualified to provide the information? Are they presenting opinions rather than facts? Are they biased?
- Is the site recognised from other sources?
- Are there other links to the site and is it reviewed anywhere?
- Is the material biased? 'Does the author have a "vested interest" in the topic' or an axe to grind?

Other sources

- Letters and memos,
- newspaper articles,
- computing magazines,
- company sales literature and
- television programmes.

Newspapers, television programmes and computing magazines may provide popular material but their depth may be somewhat limited

Tracing the information

- *Internet*
  - http://www.google.com/
  - http://www.yahoo.cm/
  - http://www.lycos.com/
  - (http://www.wikipedia.org/

- http://www.jiscmail.ac.uk/
- **Intute (http://www.intute.ac.uk/sciences/)**
- **ISI Web of Knowledge (http://wos.mimas.ac.uk/).**
- **Research Navigator (http://www.researchnavigator.com/)**
- **ACM Association of Computing Machinery (http://www.acm.org**

- **The Collection of Computer Science Bibliographies (http://liinwww.ira.uka.de/bibliography/)**
- **IEEE Computer Society (http://www.computer.org).**
- **Lecture Notes in Computer Science (www.springer.de/comp/lncs).**
- **Neuron AI directory (http://www.neuron.co.uk/).**
- http://www.hull.ac.uk/lib/infoskills/aslib.html.

Critical evaluation

- What kind of article is it – a review paper, an evaluative paper, a theory paper, a practical paper, a case study, etc.?
- What can you gain from the article – ideas, techniques, useful quotes?
- Is the author well recognised in his/her field? Is the author an authority in this area?
- What contribution is the article making? What kind of contribution is it? Can it maken a contribution to your own project? If so, how?

Critical evaluation

- How does the article fit into and support the context of your project?
- Do conclusions follow logically from the work that has been presented
- What do you feel about what has been written? Do you agree with statements that are made?
- What references does it use? Are these appropriate, relevant and up-to-date

SUMMARY

- literature survey will help to place your project within a wider context and justify its presence within a particular field (or fields) of study.
- Your literature survey consists of two main components: the literature search (supported by an ability to manage the information you gather) and the literature review (which requires a critical understanding of material that you obtain).

- *Imagination is more important than knowledge. For knowledge is limited to all that we now know and understand, while imagination embraces the entire world, and all there ever will be to know and understand.*

Albert Einstein (1879–1955)

STRUCTURE OF A RESEARCH PROPOSAL

three guidelines for writing an effective title:

- Indicate clearly the content and focus of the research project.
- Make it clear and concise. The primary function of a title is to provide a precise summary of the paper's content so avoid unnecessary details.
- A good title should be no more than 15 to 20 words.
- Make it descriptive; include keywords that describe the proposal.

Possible format for an Introduction:

- Introduce the area of research
- Review key research papers
- Identify any gap in knowledge or questions that needs to be answered
- Your hypotheses or research objectives
- Scope of your research project

kind of research

- Experimental—equipment, materials, method
- Modelling—assumptions, mathematical tools, method
- Computational—inputs, computational tools, method

TIPS ON WRITING STYLE AND LANGUAGE IN A RESEARCH PROPOSAL

- Clear: Is what you have written intelligible and are your ideas clearly articulated?
- Concise: Have you written your proposal in a succinct and focused way?
- Coherent: Are the sections of your proposal clearly linked so that it is clear to the reader what you want to do, why you want to do it and how you will do it?

TIPS ON WRITING STYLE AND LANGUAGE IN A RESEARCH PROPOSAL

- Revise and edit your writing thoroughly: Poor grammar and inappropriate style distract your reader and compromise your credibility as a researcher.
- Use transitions: Signal to the reader as you move through your text by using transition words and expressions such as however, following this, in contrast, consequently and so on.
- Avoid overly hesitant or tentative language: Sound confident and sure about the work that you are proposing to do. So avoid excessive use of expressions such as it seems that… it is hoped that…, it might be possible…, perhaps and so on.

CHECKLIST FOR WRITING A RESEARCH PROPOSAL

- Does your proposal include

☐ A critical discussion of previous research in your area?

☐ A clear statement of your hypothesis/hypotheses or objective(s)?

☐ The methodology for your research and the expected stages?

☐ Facilities, resources, laboratory equipment needed?

LAPORAN PENELITIAN

WHAT IS RESEARCH REPORT?
Apa itu Laporan penelitian

1:An empirical research report is structured to answer specific questions posed by readers in scientific and technical fields:

- –What is the problem?
- –What was done to study the problem?
- –What was found?
- –What do the findings mean ?

(Introduction to Technical Writing: Process & Practice, by Lois Johnson Reid)

2:An empirical research report is a report in which you gather your most important information from primary sources, such as the field or laboratory, rather than published documents. The research focuses on why certain things happen.

(Power Tools for Technical Communication,McMurray, Harcourt College Publications 2002)

KOMPONEN LAPORAN PENELITIAN

1 Title

2. Authors: Affiliations

3. Abstract: Synopsis of study

4. Introduction: Literature review, statement of goals, research questions, and hypotheses

5. Methods and Materials: Participants, measures, equipment, statistical techniques, etc.

6. Results: Summaries and analyses of the measures obtained

7. Discussion & Recommendations : Interpretations and implications of the study

8. References

TITLE - JUDUL

The title is a concise summary of the empirical research report. The title should convey appropriate information about the study or studies presented in the report.

AUTHORS-PENULIS-PENELITI

People who make a major contribution to the study are listed as authors. You might want to do a background search on the authors in order to determine the expertise the researchers have.

Questions that have to be answered here:

- Who did the research?
- Is there an established protocol for the order of the authors' names?

ABSTRACT

A report of an empirical study also includes an abstract. The abstract is a brief but comprehensive summary of the empirical research report. It includes a concise statement of the goal of the research, outlines the methods, and presents the essential results and conclusions.

Questions to be answered here:

- Why did you do the study?
- How was the study done?
- What did you find?
- Why are these findings important?

INTRODUCTION

The introduction sets the research in a context (it provides the "big picture"), provides a review of related research, and develops the hypotheses for the research.

The purpose of the introduction is to describe the problem, develop the theoretical and empirical background for the research questions, and elaborate a rationale for all parts of the study.

Cont'd …

INTRODUCTION…. Cont' d

In order to understand why the research was conducted, you need to ask yourself the following questions:

- What are the research questions?
- Where did these research questions come from?
- Is the research important? Why or why not?

These questions set up the context and rationale for the study.

LITERATURE REVIEW

Analyze published studies relevant to the issue under study.

Synthesize to avoid simply listing studies and findings.

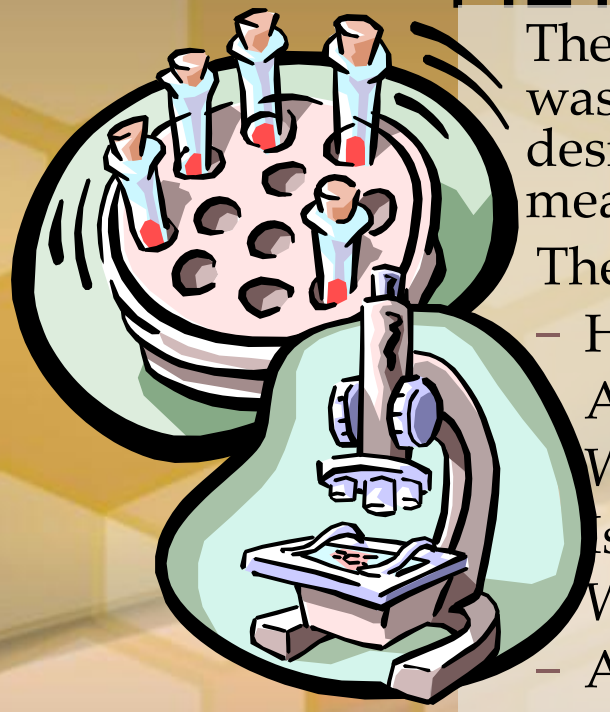
Cite studies with author(s) and date.

Avoid plagiarism by constructing a comprehensive outline.

State Your Objective: Purpose of the Study

State Your Research Questions
State Your Hypothesis: What you thought you'd find?

METHODS & MATERIALS



The methods section is a description of how the research was conducted, including who the participants were, the design of the study, what the participants did, and what measures were used.

The questions that will help you evaluate the method are:

- Have you explained the samples used in the study?
- Are the samples appropriate for the study?
- What is the research design?
- Is the design appropriate for the research question(s)?
- What are the measures?
- Are the measures appropriate for addressing the research question(s)?
- What ethical considerations are important to address?

RESULTS

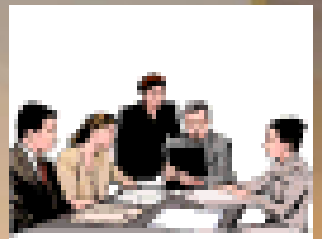
The results section contains the summaries and analyses of the measures obtained in the study. This is where the "answers" to the research questions are found.

The following questions will help you evaluate the results:

- What are the main results of the study?
- Can the results be used to answer the research question(s)?
- Can the results be generalized beyond the context of the study?

You need to understand what the results are before you can think critically about them. This can be a tough task if you don't know how to interpret the results. A good way to start to understand the results is to study the figures and tables. Then read the text for the researchers' interpretations.

DISCUSSION



The discussion section contains the interpretations and implications of the study. There may be more than one study in the report; in this case, there are usually separate Method and Results sections for each study followed by a general discussion that ties all the research together.

The discussion section should start with a summary of the most important results and then follow with a discussion of how the results address the research questions.

Consider these questions as you write the discussion section:

- What conclusions do the researchers draw from their results?
- Are the conclusions important?
- Why or why not?

Cont'd …

DISCUSSION …. Cont'd

Explain your results:

- Did your results support your hypothesis?
- Did your results relate to your objective?
- Did your results interpret in light of other published results on the subject?
- Did your results suggest directions for further research?
- Did your results discuss the limitations of your study?

This section, or area of the report, is also the place to make recommendations or state ideas for further research.

REFERENCES

The references section cites all the literature reported in the article. The reference citations are used to support statements made in the article.

SOME TIPS

When preparing the report remember to :

1. Determine that the objective is a project involving discussion of causes, effects, or both.
2. Define the audience and purpose (&/or describe problem and background).
3. Perform the research.
4. Plan and develop graphics and tables.
5. Identify causes.
6. Identify effects.
7. Identify the relationships between causes and effects.
8. Discuss causes and effects.

References for this slide

Introduction to Technical Writing: Process & Practice

by Lois Johnson Reid, Bedford/St.Martin's 1993:

Power Tools for Technical Communication

McMurray, Harcourt College Publications 2002

Wire Research:

http://wire.rutgers.edu/research_assignments_empirical_link.html

Online Technical Writing

http://www.io.com/~hcexres/tcm1603/acchtml/otherep.html#primresch