

Writing Up Research

(Experimental research)

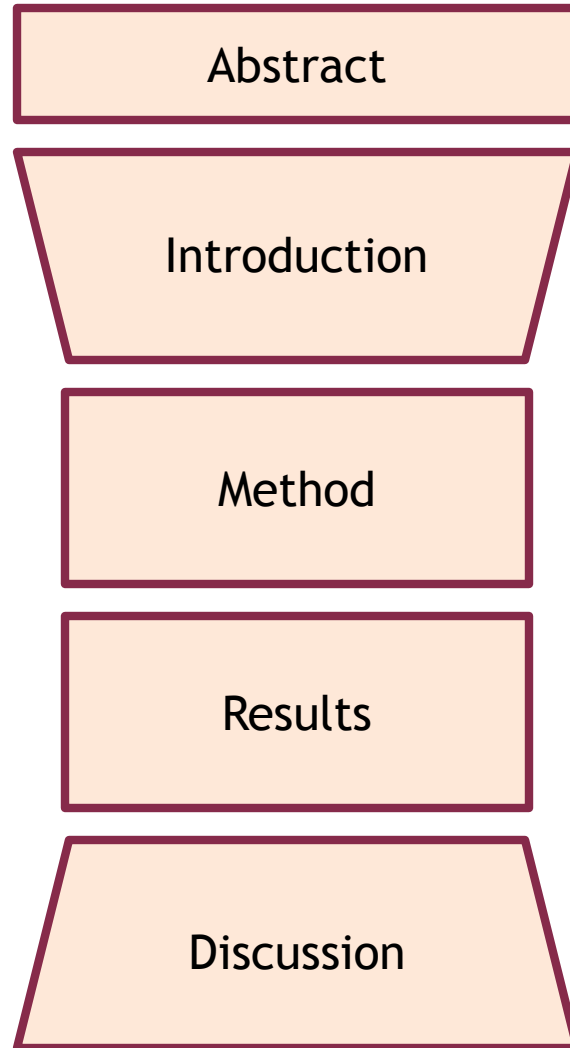
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Credits

- Most of the slides were summarized by Anan Phonphoem from the book “Writing Up Research, by Robert Weissberg and Suzanne Buker, Prentice Hall Regents, 1990, ISBN 0-13-970831-6”

Basic Components of experimental research report



Introduction

- ◉ Serve as orientation of the report
- ◉ Divided into 5 Stages
 - Stage 1: general knowledge of the field
 - Stage 2: more specific info., previous studies
 - Stage 3: need for more investigation, Why study?
 - Stage 4: purpose/objectives of the study
 - Stage 5: (optional) give a value (คุณค่า), justification (เหตุผล), or applications

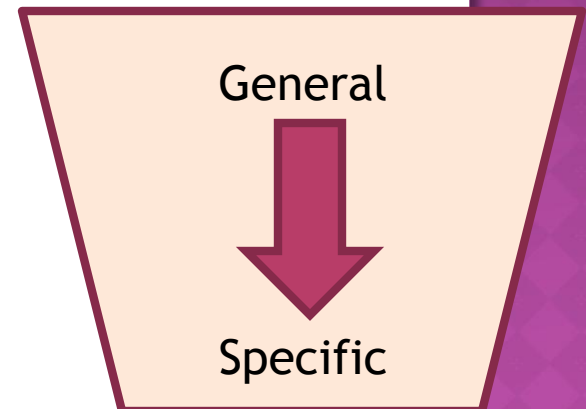
Abstract

Introduction

Method

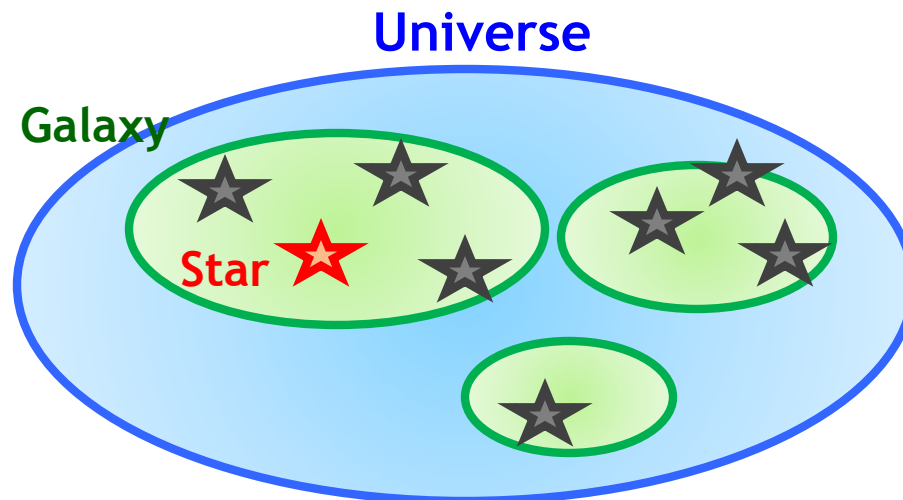
Results

Discussion



Introduction: Stage 1

- Provide readers with necessary background
- Start with obvious, general statements
- Step by step becomes more specific to the topic - identify sub area
- A few sentences / paragraphs



Introduction: Stage 2

- Literature review
- Organized collection of references (citations)
- 3 important functions
 - Continue with the background from stage 1
 - Show the familiarity of the research fields
 - Show your study is related to the fields

Abstract

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Introduction: Stage 2

◎ Citation focus

- Information prominent (เด่นชัด) (citation at the end of sentences)
- Author prominent (start with name)
- First information prominent → weak author prominent → author prominent (specific findings)

◎ Order of citations

- Most distantly related (general) → most closely related (specific)
- Chronological order
- Grouping by different approaches (inside group: general → specific)

Introduction: Stage 2

English Language

- Info. prominent (report facts) → Present tense
- Weak author prominent → Present perfect tense
 - Ex. Several researchers have studies the relationship...
- General statements → Present perfect tense
- Author prominent → Past tense
 - Ex. Anan found that

Beginning

- Info prominent
- weak author prom.
- general statements



Later

- Author prom.

- Present tense
- present perfect tense



- Past tense

Introduction: Stage 3

- Specific research problem
 - Details will be shown in your reports
- Indicate area that is not treated in the previous literature
 - Point out the gap
 - Identify things ignore by other authors
 - Unresolved conflict
 - Important to your study
- Prepare readers for your own study
- Maybe short (1-2 sentences)
 - Ex. Few studies have reported on ...
- Signal words
 - However, but, although, While

Introduction: Stage 4

- Announce your statement of purposes
- Need to be very concise
- Directly follows the stage 3
 - It answers the need expressed in stage 3
 - Implied questions in the statement of purposes
 - Ex. “the paper reports the distribution and status of ...”
 - → Question: What is the distribution?
- Example
 - The purpose of this thesis is to determine ...
- Emphasis words
 - It’s your work
 - “this study”, “the paper presents”

Introduction: Stage 5

- ◉ Statement of values
- ◉ Indicate possible benefits / applications of your work
- ◉ Important for thesis/dissertation
 - Ex. “The results of this study could be useful for ...”
- ◉ Written in suggestion/tentativeness
 - Should not too sure
 - Sounds more caution
- ◉ Signal words
 - May, could
- ◉ Degree of tentativeness
 - will (*sure*) → would → should → may → could (*tentative*)

Method

- ◉ Procedural steps conducted in your study
- ◉ Materials used
- ◉ Show how to produce your results
- ◉ For others to replicate your study

Information Elements

- Overview of the experiments
- Sample or population
- Location
- Restrictions / Limiting conditions
- Sampling techniques
- Procedures*
 - *step-by-step, chronologically*
- Materials *
- Variables
- Statistical Treatment

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Writing procedure

○ Language in procedure

- *Past Tense*: “The digital board supplied with 5 Volts DC ...”
- **Passive voice** (common)
 - Active voice (some may prefer, personal style)
- Using short passive form (common)
 - Ex. “The data were collected and (they were) analyzed.”

About Passive Voice

- Readers interest in your work / what you did
 - More than yourself
- Sound more objective
 - Saying “We applied the numerical results ...”
 - Compare to “ The numerical results were applied ...”

Material and Method

○ Example materials

- Laboratory equipment
- Field equipment
- Human or animal subjects
- Natural substances
- Surveys, questionnaires and tests
- **Computer models**
- **Mathematical models**

Research methodology: Computer Science

- ◉ Writing programs
- ◉ Building systems
- ◉ Developing architectures
- ◉ Developing content architectures
 - ontologies, knowledge bases, class libraries, graphics toolboxes
- ◉ Measuring properties of units
- ◉ Finding and proving theorems
- ◉ Analyzing and consolidating previous research
- ◉ Interviewing experts, customers

Required Skills

- ◉ Programming
- ◉ Design / Design of experiments
- ◉ Organization
- ◉ Mathematics / Statistics
- ◉ Psychological techniques
- ◉ Protocol analysis
- ◉ Experimental manipulations
- ◉ Survey methods
- ◉ Writing / Critique
 - Proposals, papers
- ◉ Giving talks

Describing materials

- Overview
 - General ideal of the material
 - purpose
- Description of principal parts
 - Major part
 - Characteristic of material
- Functional description
 - Various features
- Language
 - Present Tense

Abstract

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Results

- Present the findings of your study
 - With briefly comment
- “Results and discussion”
- Presenting in
 - Figures, tables, graphs and diagrams
 - Complete findings in numerical terms
 - Accompanying text
 - Focus on the most important aspects of results
 - Interpretation

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Information Elements

○ 3 Information elements

- **Part 1:** A statement that locates the figures where the results can be found
- **Part 2:** Statements that present most important findings
- **Part 3:** Statements that comment (explanation) on the results

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Ordering comments

- Short comment (one or two sentences) after each significant result
 - (Result1+ comment1) + (Result2+comment2) + ...
 - Suitable for many individual results with specific comment
- Leave comments until all results have been mentioned
 - Result1 + Result2 + Result3 + comments
 - Several individual results with one general comment
- Extract all comments in a separate section
 - Discussion section

Function of comments

- Generalize from the results
- Explain possible reasons for the results
- Compare the results with other studies' results

- Language
 - Present tense
 - Ex. “Results are presented in Table 1”

Discussion

- Last section followed by the references
- Step back and take a broad look at your findings
- Sometimes called “Conclusions”

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Information Elements

- Move from specific results to general implications (สิ่งที่เกี่ยวข้อง, ผลที่ตามมา)
- Main purpose or hypothesis of the study
 - Ex. “In line with the hypothesis, we assumed that ...”
- Review the most important findings
 - Agree / disagree
- Explanations / Speculation (พิจารณา) about the findings
 - Ex. “These results can be explained by assuming that ...”
- Limitations

Information Elements

- Implication of the study (generalization from the results)
 - Ex. “It appears that ...”
- Recommendations for future research / practical applications
 - Ex. “These findings suggest that ... ”

Abstract

- Provide the reader with brief preview of your study
 - Decide to continue reading the paper or not
- Last part of the report to be written

Typical Elements

- **Background** information
- **Purpose** of the study (with scope)
- Some information about the **methodology**
- The most important **results** of the study
- Statement of **conclusion** or **recommendation**

- **Reduced abstract**
 - Purpose + method
 - Results
 - Conclusions and recommendations

Language

- **Background information**
 - Present tense
- **Purpose of the study (with scope)**
 - Past tense / present perfect tense
- **Some information about the methodology**
 - Past tense
- **The most important results of the study**
 - Past tense
- **Statement of conclusion or recommendation**
 - Present tense / tentative verbs

References

- ◉ Writing Up Research, by Robert Weissberg and Suzanne Buker, Prentice Hall Regents, 1990, ISBN 0-13-970831-6
- ◉ Method and Research Design, Gerry S. Doroja, MSCS, Department of Computer Science, Xavier University