

Science and Engineering Dissertation 2: Discussion, Conclusions & Recommendations, Abstract

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*Ryerson University sits on the
Traditional Territory of the
Mississauga's of New Credit
First Nation. We are
honoured to be a part of this
community of our Indigenous
colleagues and students.*

- Chi Miigwetch



Based on *Writing for Science and Engineering*

by Silyn Roberts

Discussion, Conclusion & Recommendations

Purpose

Answer the research question

Show how the results support the answer

Show relationships among results

Show relationship of results to other studies

Draw conclusions

Difficulties

Having trouble deciding where to start

Being unsure of what to include

Starting writing too soon. This is one of the most difficult parts of the dissertation. Don't begin it until you have finished the Methods and Results sections

How to Write it

Present the main trends, the relationships among trends, and generalizations of trends

Any conclusions that you draw must be clearly stated

Avoid merely restating the material

Discuss any contrary results and attempt to explain them

Explain agreements or disagreements between your work and other published studies

How to Write it

Do not try to hide data that are contrary to your conclusions. Give explanations.

Give evidence for each conclusion

If you speculate, keep it plausible

Defend your conclusion, but be respectful to contrary studies.

State the limitations of your study design

State the important implications of your study

Overall Structure

Beginning: State the aim. Give a brief summary of the results

Give the main point and the strongest arguments before the others

Present the main conclusion again in the final paragraph

Word Choice

Avoid the word “prove”

Use “show, demonstrate, indicate, support, suggest, imply, appear”

Hedging terms like “may be, might be, could be, probably, possibly” may be used as needed, but avoid using too many hedges in one sentence

Verb Tense

Past tense for results

Present tense for outcomes: the answer to the research question, facts, and current situations

Common Errors

The main point is not clear

Too wordy, unorganized

Too short: not all implications have been discussed; not enough familiarity with the literature to contextualize your work

Not beginning with the most important outcomes

Common Errors

Not enough discussion of the significance of the outcomes. The outcomes are not put into context

Unjustifiable conclusions, not supported

Some results are ignored

The interpretation obscures the true meaning of the data

Checklist

It is well structured

The main point is at the beginning

The other points appear in descending order of importance

It interprets the results

It places your work in the context of research in the field

Checklist

Each conclusion is based on evidence

All hypotheses are reasonable

There are no vague statements. Hedging is not overdone

The writer gives a fair, accurate, and objective treatment of other related studies

All anomalous outcomes are presented and explained

More About Conclusions

After the Discussion section the main conclusions of the study are summarized

They are usually numbered consecutively

How to Write it

Nothing new is presented here. Each conclusion is based on previously discussed information

Each conclusion is brief

The focus is on importance, validity of results, limitations of the study

Format: Often a numbered list in descending order of importance

Common Errors

Too vague and general

Not previously stated in the dissertation

Checklist

Everything in the Conclusions has been mentioned previously

Each conclusion is well supported by information in the dissertation

The main conclusion is first

The conclusions are in descending order of importance

Recommendations

This section gives a list of recommendations that reflect the conclusions. It proposes actions that should be taken

It is usually combined with the Conclusions in a section called Conclusions and Recommendations

How to Write it

Base each recommendation on your expert view of what can and should be done

Recommendations may refer to a need, a new concept, a new project, a solution to a problem

Use a numbered list, if possible, and try to match the numbers with those of the Conclusions. Each conclusion may lead to one or more recommendations

Verb Tense

It is recommended that the experiment should be replicated at 250 degrees Celsius.

It is recommended that the experiment be replicated at 250 degrees Celsius.

It is recommended that the experiment is replicated at 250 degrees Celsius.

The recommendations are:

Replicate the experiment at 250 degrees Celsius.

Checklist

The main recommendation is first

The recommendations are in descending order of importance

Each recommendation is clearly stated

Each recommendation is feasible

Each recommendation is related to information in the dissertation

Suggestions for Future Research

This section may be added to the end of the Conclusions and Recommendations section

Limit the information to the most important ideas for future work

You may mention a possible continuation of your experiment, especially areas that you feel have not been adequately explored

You may mention a long-term development that could be based on your work

References

Follow a style guide (e.g. APA, IEEE, CSE, etc.)

Place this list after the Recommendations

It is called “References” or “List of References” or “Reference List” or “Sources”, depending on the style you use

Acknowledgements

Thank your supervisor and others for:

material

technical help

discussions

contacts

emotional support

How to write it

“I would like to thank the following people:”

“I am particularly grateful to...for...”

“I would also like to thank...”

Include title, full name and initials, and department, institution, etc.

Common problems

Sounding patronizing or silly

Not including title, full name, and affiliation

Table of Contents

Purpose:

Give a list of headings and sub-headings with their page numbers

How to write it

Determine the lowest level of heading you want to show.

On the left side of the page list all the headings and subheadings that you want to show. Number them appropriately.

Place the corresponding page numbers to the right. Numbering begins with the introduction.

Listing the abstract is optional.

Checklist

What layout should be used

Correct formatting, consistent indentations

Page numbers correspond with those in the text

(Most word processors have a feature for automating the Table of Contents.)

Common Errors

Mismatches in wording and page numbering

Indenting and formatting are inconsistent

Checklist

Front matter pages are numbered in small Roman numerals

The following are listed and correctly numbered: chapter headings, section and subsection headings, the Reference section, all appendices

Each appendix has a title

Page numbers match with the text

Formatting and indentations are consistent

Sequence and numbering of all headings and subheadings match the text

List of Illustrations

Purpose:

To give a separate listing of illustrations

To include numbers, titles, and page numbers of all figures and tables

How to write it

If you are using both figures and tables, call it “List of Illustrations”. List the figures first, followed by the tables

If you are using only figures, call it “List of Figures”. If you are using only tables, call it “List of Tables”

Give the number, title, and page of each

This list follows the Table of Contents on a separate page unless both are short

Checklist

Figures are listed before tables

Number, title, and page for each illustration are given

The page numbers match with the text

The illustration numbers in the text match the list

Glossary

Purpose

To give definitions of all specialist terms used in the dissertation

To explain symbols and abbreviations used in the dissertation

How to write it

Preface the list with a statement such as the following:

S.I. (Système International d'Unités) abbreviations for units and standard notations for chemical elements, formulae and chemical abbreviations are used in this work. Other abbreviations are listed below.*

*(Silyn-Roberts, 2000, p. 27)

How to write it

Decide on the terms that need to be defined. Avoid defining well known terms

These include technical terms, symbols (including Greek letters), abbreviations and acronyms

Placement

Immediately after the Table of Contents

If there are no abbreviations, it may be placed at the end, before the appendices

If there are many abbreviations and terms, the list may be split into two lists: “Glossary” and “List of Abbreviations” and placed in that order after the Table of Contents

Abstract

Purpose

Allow reader to see the main points at a glance

Provide a 'road map' for the dissertation

Enable the reader to decide whether or not to read the entire document

Common Errors

Being descriptive and not informative

Deciding what to include

Giving adequate coverage

Giving balanced coverage

Giving a coherent narrative

Achieving the desired length

General Format

A not-too-general statement placing the work in context

Method

Results and/or observations

Main conclusions

Main recommendations (if appropriate)

Advice

Make it informative

Add no new information

Do not include figures, tables, references

Complete the dissertation before writing the Abstract

In addition to the Abstract, give short chapter summaries at the beginning of each chapter

Length

Master's dissertation: approximately 300-500 words

Ph.D. dissertation: approximately 500-800 words

Varies according to length and complexity of the content

Checklist

Contains context statement, method, results, conclusions,
(recommendations)

It is informative, rather than descriptive

Contains no new information

Was written after the dissertation was completed

Graduate Student Support

- One-on-one tutorial sessions to help students with writing and referencing during any stage of the process.
- Two 50-minute appointments per week.
- Online workshops on a variety of graduate writing-related topics.
- Useful guides and resources on the website.
- Be sure to make an appointment on our website a week or two before your desired date as spots fill up quickly.

4th floor, Student Learning Centre

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