

Developing and Refining PhD Thesis Statements

Iadh Ounis and Craig Macdonald



Your PhD Journey...

At the end of your PhD, the aim is that you have written a *book*, called a thesis

- This book makes a structured, scientific argument, usually backed by empirical results

The argument of your thesis revolves around a single *thesis statement*

- You write your thesis chapters with the statement in mind...
- As a consequence, you conduct your PhD research programme (papers & thesis chapters) to validate that statement

Your thesis statement is your “contract” for conducting your PhD!

Outline

- 1. Characteristics of a Thesis Statement**
- 2. Developing a Thesis Statement**
- 3. The importance of a Thesis Statement for planning your PhD research programme**
- 4. Structuring your Thesis around the Thesis Statement**

CHARACTERISTICS OF A THESIS STATEMENT

What is it?

For your PhD thesis, it's a paragraph-long statement that explicitly outlines **the purpose or the point** of your thesis

It generally starts with a complex, compound sentence

What does it do?

It should point towards the course of an **argument** the reader can expect your thesis to make

An arguable thesis requires you to think about which **supporting arguments** best challenge the other side of the issue

An **arguable thesis statement** is NOT a **statement of fact**

Examples

Statement of fact: Smoking can cause health problems

Arguable thesis statement: The government should ban smoking altogether

Statement of fact: On average, people with University degrees earn more money in the workplace.

Arguable thesis statement: A University degree should not be required for the profession

Statement of fact: Foul language is common in movies.

Arguable thesis statement: The amount of foul language in movies is disproportionate to the amount of foul language in real life.

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A Process

A topic: *Sugar consumption*

[Source: Indiana University]

A narrow topic:

Reducing sugar consumption by elementary school children.

Take a position:

More attention should be paid to the food and beverage choices available to elementary school children.

But too vague:

Experts estimate that half of elementary school children consume nine times the recommended daily allowance of sugar.

But that's not an assertion

Because half of all American elementary school children consume nine times the recommended daily allowance of sugar, schools should be required to reduce the number of soda machines with healthy alternatives.

SUCCESS!

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Where does it go? And Why?

Because the rest of the PhD thesis will support or back up your thesis statement, the statement is a section near the end of the Introduction chapter.

In your thesis, a thesis statement – rather than just research questions or a research problem statement – gives a coherence to the argument of your thesis.

- It helps to structure your thesis to show that your statement is supported.

Example of thesis statement

“The statement of this thesis is that an effective diversification performance can be attained by explicitly representing the multiple possible information needs underlying a query as sub-queries.” } Assertion

In particular, by inferring the relative importance of each sub-query, the retrieved documents can better cater for the needs of the user population. Moreover, by maximising the relevance of the retrieved documents with respect to multiple sub-queries, a high coverage of these sub-queries can be achieved. Furthermore, by estimating the relevance of the retrieved documents to already well covered sub-queries, a high novelty can also be attained. Finally, by inferring the level of ambiguity of different queries, a balance between promoting relevance or diversity can be effectively attained.” } Supporting arguments

So why is the thesis statement important?

The thesis statement determines what you are required to validate in your thesis

- Every chapter in your thesis exists in order to **support** your thesis statement
- So that every chapter **validates** parts of the thesis statement – and all chapters validate the whole statement: necessary & sufficient
- Accordingly, if one of your chapters seems irrelevant to your thesis statement you have two choices: get rid of the chapter, or **revise** your thesis statement

Your thesis statement should be defined very early in your PhD progression, as it defines your plan of research

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DEVELOPING A THESIS STATEMENT

Attributes

It **takes a side on a topic** rather than simply announcing that the thesis is about a topic (the title should have already told your topic to the reader)

Don't tell readers *about* something; tell them *what* about something. Answer the questions "how?" or "why?"

It is sufficiently **narrow** and **specific** that your supporting points are necessary and sufficient, not arbitrary

More Attributes

It argues one **main point** and doesn't squeeze three different thesis statements for three different theses into one sentence

“The statement of this thesis is that an effective diversification performance can be attained by explicitly representing the multiple possible information needs underlying a query as sub-queries.” [Santos 2013]

And most importantly, it passes the **"So What?" Test**.

- If a reader's first response is, "So what?" then you need to clarify, to forge a relationship, or to connect to a larger issue.
- This is about the contribution of the thesis: is the problem important, and is the solution novel?

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An Equation

Thesis statements are basically made up of your topic and a specific assertion about that topic, therefore,

THESIS STATEMENT = TOPIC + SPECIFIC ASSERTION

e.g. *“The statement of this thesis is that in **TOPIC**, **XXX** can be **YYY**.”*

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The four “Shoulds” of a thesis statement (1)

A good thesis statement **should take a stand** - don't be afraid to have an opinion; if after your research, your opinion changes, all the better - means you have been thinking; you can write a new thesis statement!

e.g. There are some negative and positive aspects to the Banana Herb Tea Supplement.

vs

Because Banana Herb Tea Supplement promotes rapid weight loss that results in the loss of muscle and lean body mass, it poses a potential danger to customers.

The four “Shoulds” of a thesis statement (2)

A good thesis statement **should justify discussion** - don't leave your readers saying to themselves "So what" or "duh?" or "like what's your point?"

My family is an extended family

vs

While most American families would view consanguineal marriage as a threat to the nuclear family structure, many Iranian families, like my own, believe that these marriages help reinforce kinship ties in an extended family

The four “Shoulds” of a thesis statement (3)

A good thesis statement **should express one main idea** or a clear relationship between two specific ideas linked by words like "because," "since," "so," "although," "unless," or "however.”

Companies need to exploit the marketing potential of the Internet, and Web pages can provide both advertising and customer support.

vs

Because the Internet is filled with tremendous marketing potential, companies should exploit this potential by using Web pages that offer both advertising and customer support.

Example

Poor: Stephen King writes readable books.

Good: Stephen King’s books are so good **because** they are about normal people who get into supernatural situations.

Bad: “*Computer science should not be researched at university.*”

Good: “*Computer science is a pointless enterprise that has no place in university, **because** its too tied to technology trends.*”

The four “Shoulds” of a thesis statement (4)

A good thesis statement should be restricted to a specific and manageable topic - readers are more likely to reward a thesis that does a small task well than a thesis that takes on an unrealistic task and fails

World hunger has many causes and effects.

vs

Hunger persists in Glandelinia because jobs are scarce and farming in the infertile soil is rarely profitable.

A Thesis Statement Is (and is Not) . . .

A Thesis Statement IS . . .	A Thesis Statement IS NOT . . .
An assertion	A statement of fact or observation
Taking a stand	Announcing a subject
A main idea	A title
Narrow	Broad
Specific	Vague or general
One main point	Several main points

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THESIS STATEMENT... FOR PLANNING PHD RESEARCH

What it determines: the PhD research plan

Normally, the aims of the earlier phase of a PhD research programme are three-fold:

1. **Perform a literature review around your topic**
2. Work on a mini research project
3. **Define a thesis statement for your PhD**

Your thesis statement:

- defines what you need to argue for the novelty of
- defines how you plan your research for the remainder of the PhD thesis

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Literature Review

The literature review in your thesis is not just a brain-dump of everything you read:

- Its purpose is to identify "**a gap in the literature**" i.e. something that has not yet been researched.
- This should support the novelty of your thesis statement

Whenever you read anything, an article, a book, a chapter, a thesis ... write out your own summary of what you've learnt and what you still don't know.

- Use **mind maps**, tables, pictures, or whatever works for you but keep tracking the relationship between known, unknown and your contribution.

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Minesweeper...

Minesweeper game: “Try to find an empty square and be clear about the contents of adjacent squares.”

- Clear white space around your own interest may mean that you have found something interesting that no-one has ever researched.
- However, such splendid isolation may make it hard to find related studies to cite.

Diversification strategy	Aspect representation	
	Implicit	Explicit
Novelty	Carboneil & Goldstein (1998)	
	Zhai et al. (2003)	
	Chen & Karger (2006)	
	Zhu et al. (2007)	Santos et al. (2012b)
	Wang & Zhu (2009)	
Coverage	Radlinski & Dumais (2006)	
	Radlinski et al. (2008a)	
	Capurini et al. (2011)	
	Santos et al. (2012b)	
Hybrid	Yue & Joachims (2008)	Agarwal et al. (2009)
	Santos et al. (2010e)	Santos et al. (2010a)
	Raman et al. (2012)	Silvkin et al. (2010)



My work in the gap!

[Rodrigo Santos PhD thesis, Univ of Glasgow, 2013]

Example Thesis Statement & Research Plan

“Identifying *concurrently presented earcons* where those *earcons* are constructed from a complex “grammar” is difficult. Whilst modifications can be undertaken to significantly improve earcon identification, these modifications are constrained due to the need to preserve the mapping between data and sound.

This statement will be defended through work which seeks to answer the following four research questions:

- RQ1 What is the effect on earcon identification of varying the number of earcons which are concurrently presented?
 - RQ2 How can concurrently presented earcons be more robustly designed and presented in order to increase the number which can be identified?
 - RQ3 What is the impact of presenting concurrent earcons in a spatialised auditory environment?
 - RQ4 How much do modifications to the design and presentation of concurrently presented earcons affect performance in “real world” tasks?
- <snip> This work is novel in that no previous study has ... ”

Use it to maintain your progress...

“Identifying *concurrently presented earcons* where those earcons are constructed from a complex “grammar” is difficult. Whilst modifications can be undertaken to significantly improve earcon identification, these modifications are constrained due to the need to preserve the mapping between data and sound.

This statement will be defended through work which seeks to answer the following four research questions:

- RQ1 What is the effect on earcon identification of varying the number of earcons which are concurrently presented? ✓ **Chapter 4 ready**
- RQ2 How can concurrently presented earcons be more robustly designed and presented in order to increase the number which can be identified? ✗
- RQ3 What is the impact of presenting concurrent earcons in a spatialised auditory environment? ✓ **Chapter 6 has paper published**
- RQ4 How much do modifications to the design and presentation of concurrently presented earcons affect performance in “real world” tasks? ✓ **Chapter 7 ready**

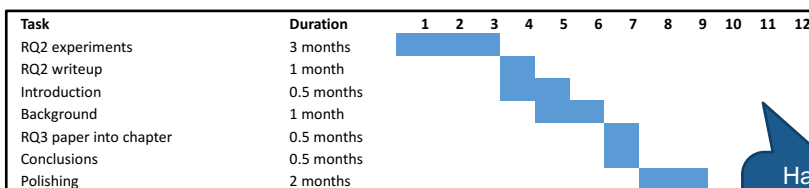
<snip> This work is novel in that no previous study has ...”

[David McGookin PhD thesis, Univ of Glasgow, 2004]

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Plan out your time

Plan your time: What is necessary to fully support your thesis statement?
You can use a Gantt Chart based on these research questions



- Suggestions: Ganttproject.biz is free Java app, or simply tables or Excel

Have you planned contingency time?

Table 1: Timetable.

Period	Planned activity
March-May	Research on Generalised Interleaving; CIKM 2015 submission.
May-June	Writing the <i>Introduction</i> chapter of the thesis.
June-July	The <i>Background</i> chapter of the thesis.
July-August	The <i>Evaluation pipeline</i> chapter of the thesis.
August-September	The <i>Offline Evaluation</i> chapter of the thesis.
September-October	The <i>Optimised Scheduling of Online Experiments</i> chapter of the thesis.
October-November	The <i>Improving Sensitivity of Interleaving Experiments</i> chapter of the thesis.
November-December	The <i>Sequential Testing for Early Stopping of Online Experiments</i> of the thesis.
December-January	The <i>Early Stopping of Sensitive Interleaving Experiments</i> and <i>Conclusion</i> chapters of the thesis.
February	Thesis submission.

[Eugene Kharitonov, 3rd Year Report, 2015, Univ of Glasgow]

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Is it fixed in concrete?

Imagine that as you are writing your thesis you stumble across a new idea

This observation is a good one; do you really want to throw it away? Or do you want to **rewrite** your thesis so that it accommodates this new idea?

But...

A PhD is not a never-ending endeavour – you have **one** chance in your life to stick to a single coherent piece of research and get it written down

- Liaise with your supervisor about the relevance of an idea and when the thesis statement should be adapted

Hence, use meetings with your supervisor to step back and see how you are proceeding with the planned research towards addressing your thesis statement

Refining the Statement

“This thesis states that the classification of queries as news-related or not, as well as the selection of results to be displayed to the user for those news-related queries, can be effectively achieved through the application of user-generated content for evidence. <snip>” – [Richard McCreadie, 1st year report , 2010]

This thesis states that user-generated content can aid in satisfying news-related queries submitted to universal Web search engines in real-time. In particular, we propose a news search framework that allows to fully integrate the functionalities that are needed to deploy a news vertical within a universal search engine: a classifier to identify news-related queries, a mechanism to identify the useful news-related content and a strategy to integrate this selected content into the Web search ranking. The essential argument made in this thesis is that user-generated content can improve the performance of each component of the framework. <snip>” – [Richard McCreadie, PhD thesis, Univ. of Glasgow, 2013]

- *Richard refined his statement to more clearly define the **topic**, and the **specific assertion**.*

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THESIS STATEMENT: FOR STRUCTURING YOUR THESIS

Purposes

Thesis statements provide one or more of the following:

- Preview and roadmap
- Expectation and interpretation
- Purpose and claim
- Answer (or question)
- Stated conclusion based on evidence
- Anticipated and disproved counter-arguments

A contract

The thesis is like a **contract** between you and your reader

If you introduce ideas that the reader isn't prepared for, you've violated that contract

- E.g. McGookin [2004] explicitly linked each of his research Chapters to the research questions in his thesis statement

It's the main thing that an external examiner will start with when considering a PhD thesis

Thesis Statement within the wider Introduction Chapter

The Introduction chapter exists for two reasons:

1. To provide the rationale and necessary background information for the Thesis Statement
2. To provide a brief overview of the thesis – a clear outline of the 'story line' [Tinkler & Jackson 04]

One possible structure for the Introduction chapter:

- Introduction; Motivations; Thesis Statement; Contributions; Origins of the Material; Thesis Outline

Example of thesis statement

“The statement of this thesis is that an effective diversification performance can be attained by explicitly representing the multiple possible information needs underlying a query as sub-queries.”

Assertion

In particular, by inferring the relative importance of each sub-query, the retrieved documents can better cater for the needs of the user population. Moreover, by maximising the relevance of the retrieved documents with respect to multiple sub-queries, a high coverage of these sub-queries can be achieved. Furthermore, by estimating the relevance of the retrieved documents to already well covered sub-queries, a high novelty can also be attained. Finally, by inferring the level of ambiguity of different queries, a balance between promoting relevance or diversity can be effectively attained.”

Supporting arguments

[Rodrygo Santos PhD Thesis, Univ. of Glasgow, 2013]

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Corresponding Thesis Structure (1/2)

Chapter 2: Web IR (Background)

Chapter 3: Search Result Diversification (Related Work)

Chapter 4: The xQuAD Framework (The Proposal)

“explicitly representing the multiple possible information needs underlying a query as sub-queries.”

Chapter 5: Framework Validation

“an effective diversification performance can be attained”

Chapter 6: Sub-Query Generation

“by inferring the relative importance of each sub-query, the retrieved documents can better cater for the needs of the user population”

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Corresponding Thesis Structure (2/2)

Chapter 7: Document Coverage

“by maximising the relevance of the retrieved documents with respect to multiple sub-queries, a high coverage of these sub-queries can be achieved”

Chapter 8: Document Novelty

“by estimating the relevance of the retrieved documents to already well covered sub-queries, a high novelty can also be attained”

Chapter 9: Diversification Trade-Off

“by inferring the level of ambiguity of different queries, a balance between promoting relevance or diversity can be effectively attained”

Chapter 10: Conclusions

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Corresponding Thesis Structure (2/2)

10. Conclusions and Future Work

10.2 Summary of Conclusions

In this section, we summarise the main conclusions drawn from the thorough and comprehensive evaluation of the xQuAD framework and each of its components throughout this thesis. In particular, these conclusions fully validate the statement of this thesis, as presented in Section 1.1.

On the effectiveness of xQuAD In Section 5.2.2.1, we contrasted xQuAD to effective representatives of novelty-based, coverage-based, and hybrid diversifi-

Chapter 10: Conclusions

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SUMMARY

Summary

The thesis statement is considered to be a fundamental part of the PhD process

- Like hypotheses, it can evolve, but is used to structure your personal research programme
- It forces the early career candidates to have a context for their warm-up research work
- Progressing students evaluate their progress towards a coherent objective
- It brings coherence to the arguments made by the thesis, and will be directly examined by readers/reviewers

Do it well, early!

ACKNOWLEDGEMENTS & REFERENCES

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