

# Thesis Writing for Scientists and Engineers

## Writing Conclusions and Abstracts

There is some variation in practice about the inclusion of a conclusion at the end of an article or a thesis. Some theses or articles have a separate section entitled "Conclusion" or "Conclusions" after the Discussion of Results, others do not.

A conclusion normally summarises the main findings reported in the Discussion and will often present a number of recommendations about possible future work.

Where there is no separate conclusion, the final paragraph or paragraphs will summarise the main findings and make recommendations.

**You should ask your supervisor whether s/he prefers to have a separate conclusion.**

## I. Conclusions

### A STRUCTURE

This section considers what to include or exclude from the conclusion.

In your conclusion you will summarise your research, and probably remind your reader of the structure that was followed. You are likely to refer back to your findings and some of their implications that were presented in a "Results" or "Discussion" section.

Traditionally, you do not add new information in your conclusion. If you are tempted to do this, consider adding it towards the end of your previous chapter instead.

Here are some of the possible steps in a concluding section:

#### **(a) Report the procedure and/or aims**

For example:

*This paper analyzed central bank data to determine whether distinct groups of central banks could be identified.*

#### **(b) Report findings and claims based on findings**

For example:

*The students in this study transferred some, but not all, learning skills to the regular classroom. In particular, they appeared to make effective use of self-monitoring skills and to take responsibility for their behaviour, even when these skills were not being demonstrated by their regular class peers.*

**(c) Suggest how other research supports present findings (or vice versa)**

For example:

*This injunction is in agreement with an earlier recommendation made by Ladas (1980, p.48), in his discussion on the comparative rates of notetaking, listening, and speaking to American students.*

**(d) Suggest limitations of procedure or findings**

For example:

*A limitation of the research presented here is that the number of participants is limited to only 30 students.*

**(e) Propose implications of the findings**

For example:

*This study has implications for the teaching of academic writing to international postgraduates.*

**(f) Make recommendations (usually more specific implications)**

For example:

*Some of the difficulties of mounting an inservice program in a small and geographically widespread region were examined and this highlights the need for system inservice leaders to be very aware of the demands of the models of implementation in terms of geography, teacher careers and other factors.*

**(g) Make recommendations about future research**

For example:

*While the research reported in this study was exploratory in nature, several issues appear to need additional exploration (1, 2, 3 etc).*

**To sum up:**

- a. Report the procedure and/or aims
- b. Report findings and claims based on findings
- c. Suggest how other research supports present findings (or vice versa)
- d. Suggest limitations of procedure or findings
- e. Propose implications of the findings
- f. Make recommendations (usually more specific implications)
- g. Make recommendations about future research

Note that these stages are quite similar to the stages of a discussion section, although the focus is less on referring back to results, and more on looking at implications for the future.

**Task 1**

**The following are endings of theses at the University of Birmingham. Which of the above steps can you identify?**

A.

**8.4. Conclusion<sup>i</sup>**

The thesis has reported the relationship between posture, seating and muscle activity among dentists and dental students. The dentists and the students using the CS have followed a similar pattern and are reported here:

- Poor posture increasing the RULA risk scores
- Increase in level of pain through the workday, especially the back, neck and shoulders.

- Increase in muscle activity (percentage MVC) during dental work
- Increased neck flexion angles during dental work contributing to neck pain

The dentists and dental students using the Bambach Saddle Seat followed a pattern opposite to the dentists and dental students using the conventional seat, namely:

- Good posture decreasing the RULA risk scores
- Decrease in level of pain through the workday
- Lower muscle activity (percentage MVC) during dental work
- Neutral neck flexion angles during dental work resulting in lower incidence of neck pain.

This thesis has established the relationship between posture, seating and muscle activity and indicates that use of an ergonomic aid (dental operator stool) may improve posture, decrease pain and muscle activity and may decrease the development of musculoskeletal disorders among dental students and dentists.

B.

**7.4 CONCLUSIONS<sup>ii</sup>**

...

[Finally, improving treatment is a crucial element in improving survival for breast cancer patients.]

In the current study clear improvements in treatment in line with recent guidelines were evident. However, variation in treatment across the region indicated possible inconsistency in clinical practice. This variation will now need to be examined using standard population based cancer registration data. The lack of survival advantage for women treated by high caseload surgeons, or of a difference in the use adjuvant therapy according to caseload, is contrary to the recommendation made based on research by the COG. Further work will therefore need to be carried out in this area to assess whether caseload is a valid indicator of high quality care and improved patient outcome.

**B LANGUAGE****1. The language of Recommendations****Task 2**

Look at the concluding part of the discussion section from an article about the use of drugs in men and women.

## In-sessional

1. Divide the paragraph up into Conclusion and Recommendation
2. Think up alternative ways of expressing the Recommendation

Despite all of the adjustments, the female rate of drug acquisition remains slightly higher especially in younger age groups. Thus, it is likely that both physical and psychosocial factors influence the way in which men and women perceive, label and respond to their needs and symptoms, and the way in which physicians respond to their patients. However, as researchers continue to investigate these issues, it is critical that they collect more objective and detailed data and that they disaggregate the types of patients, diseases, symptoms and drugs being investigated.

## **2. Tense use in conclusions**

### **Task 3**

**Now look at this conclusion<sup>iii</sup>. How many different tenses can you find? Can you justify their use? Which one is used most, and why?**

#### 6.1 Current Class E Project

##### 6.1.1 Steady-state solutions

Two new analyses of steady-state operation of the Class E power amplifier have been presented in Chapter 3. They use different techniques and apply to different, but overlapping, domains characterised by circuit  $Q$  and normalised carrier frequency. Both analyses extend existing theoretical knowledge of the circuit and provide useful information for practising electronic engineers who wish to design a Class E amplifier.

The key findings from the first (power series) analysis are expressions for component values for finite  $Q$  circuits, and an estimate of the unwanted harmonic output. These were previously only known from numerical solutions at spot values of  $Q$  and frequency. The existence of the power series solution confirms that exact Class E conditions are possible for finite  $Q$ , but no longer coincide with peak efficiency. This analysis also gives expressions for the carrier frequency response, but for most purposes these are superseded by those obtained by considering energy conservation. Finally, the power series analysis gave rise to the insight that the role of the drain feed choke is simply to feed a current into the rest of the circuit; this then led to the amplitude modulation theory given in Chapter 4.

The significant results from the second (energy conservation) analysis are simple rational functions giving the frequency response of the Class E PA over the entire central region. This fills a long-standing knowledge gap, which may have seriously limited the practical usefulness of this circuit. Employing a circuit which is not peak-tuned is counter-intuitive for most engineers; especially if no frequency response formula is known. The carrier frequency response is an important input into understanding the behaviour of the circuit during phase modulation. This work also provides a way to consider the effects of varying the drain shunt capacitance, which leads to high efficiency 'Class C' designs despite operating at 50% duty cycle. The expressions from the first analysis provide results which agree with published numerical solutions. The findings of the second analysis agree with published solutions and measured data.

### **3. Cautious language in conclusions**

The following revision is taken from an Abstract by a postgraduate student of chemical engineering:

Original	Revision
In conclusion, this study is a useful first step in the development of biodegradation techniques.	In conclusion, it is hoped that this study may be a useful contribution to the development of biodegradation techniques.

Two principles of **Academic Modesty** are broken by the original drafting:

1. **Do not praise your own work.**

As an academic writer, you may describe the work of other people as valuable, useful, interesting, etc: however, you may not describe your **own** work as valuable, useful, interesting, etc. The closest you may come to such a statement is to express the **hope** that the work is valuable, useful, interesting, etc. (i.e. the judgement is for others to make, not you).

2. **Show that you understand the limitations of your work.**

In the present case, any non-expert knows that previous work has been done on biodegradation techniques: so clearly this cannot be a “first step” for science (though it was, clearly, a first step for the student).

## **II. Abstracts**

At the beginning of your thesis you will normally be required to write an **abstract**.

**Discuss with a partner:**

- **What is the main function of an abstract ?**
- **What is the difference between an abstract and the introduction?**

An abstract may also be referred to as a **synopsis** or **summary**. There are often regulations on how long the abstract should be. It usually has to be somewhere between 100 and 300 words.

Check with your supervisor if you are in any doubt and remember that the best way to familiarize yourself with the abstract style in your discipline is to read examples!

## **A      **STRUCTURE****

Read this abstract<sup>iv</sup>:

<b>Background</b>	Disciplinary variation in academic writing has been explored for the most part by comparing a particular genre, such as the research article, across disciplines. However, genre theorists have not systematically studied relationships among related genres.
<b>Aim</b>	It is argued in this article that a study of relationships among related genres from different disciplines can inform us about the differences in academic writing across disciplines.
<b>Method</b>	The generic structure of research article introductions and abstracts, which form a genre set, from two related fields, Conservation Biology and Wildlife Behaviour, was compared.
<b>Main findings</b>	Findings indicated that research article introductions and abstracts in Conservation Biology bear a greater similarity in function and organisation than the same two genres in Wildlife Behaviour.
<b>Conclusion</b>	This study reveals that disciplinary variation in academic writing is not manifested in generic structure but also in the relationship among genres.

Notice that the abstract can be broadly divided into the following steps:

- (a) background (including an indication where there is a 'gap' in our present understanding or ability)
- (b) the aim or purpose of the research
- (c) the methods used
- (d) the main findings
- (e) a conclusion or comment on previous research

There may also be **recommendations**.

Note: some abstracts give you actual results, e.g.

*the optimum sulfur dioxide reaction time was found to be 300 ° F (149 ° C)*

Others just tell you what results are reported in the article without giving figures, e.g.

*Effects of the sphere diameter and the thermal properties on the quench boiling curves were found.*

It is rare for abstracts to include citations. They may, however, refer to seminal works (key research with which the current research is compared. An abstract may also include a citation if the thesis extends or significantly contradicts the research cited.

**Task 4**

Here are some more abstracts<sup>v</sup>. Try to divide them into the sections listed above by inserting (a)-(e).

Note that the sections may be in a different order, and you will not be able to find all of them for each abstract.

**Abstract 1**

It is often assumed that women received more prescribed drugs because they have different attitudes towards illness and medical care, high anxiety and more time to visit physicians, or because physicians are biased. This study examines an alternative explanation, that is, much of the excess is associated with women's reproductive role. The study involved a detailed audit of the medical and pharmacy records of 862 men and women. Results showed that women received more prescribed drugs during the 2-year study period. However, the differences between men and women were not the same for all age-groups. As expected the differences were most apparent during the peak child-bearing years. Further analysis showed that the gender differences were virtually eliminated after excluding women with female-specific diagnoses and excluding the drug categories used to prevent or treat female-specific conditions. Previous studies based on gross measures of self-reported drug use seem to have underestimated the importance of factors that relate to women's reproductive role. Key words: gender differences; prescription drugs; drug utilization.

**Abstract 2**

Atomic absorption (AA) analysis was employed to determine, for the first time in this country, lead concentrations in aerosols collected in Nuclepore filter media during the months of February and March (1980) in Guatemala City, Guatemala. In particular, the lead in the atmospheric fine particulate was measured in different downtown locations around noontime and in a single location at 1-h intervals throughout the day. The first was used to study short-term variations from one location to the other, and the second one was used to correlate parameters such as traffic density and wind velocity with the levels of airborne lead on the same day. In addition, this paper presents a brief discussion of the lead content in Guatemalan gasoline, the lead levels in street dusts, and the total suspended particulate matter in downtown Guatemala City.

**Task 5**

Here are some more abstracts of dissertations. The paragraphs are in the wrong order. Can you put them back where they belong?



## In-sessional

**1: Mix Design For Tropical Areas Employing The Wheel Tracking Test**

1. The effect on the properties of bitumen by the addition of varying quantities of filler to produce a mortar is investigated together with the effect of bitumen/ filler ratios by weight on Marshall test values.
2. Of the two main methods of pavement failure, namely cracking and rutting, the most common mode of failure in the Middle East is through extensive rutting. [*note: 'rutting' means deforming because of the repeated passage of traffic*]
3. The dissertation investigates the various mechanical means of evaluating asphaltic designs for tropical countries with particular reference to the Wheel Tracking Machine.
4. As yet there is no acceptable and readily available, on site, method of evaluating asphaltic mixes to determine their resistance to permanent deformation when laid in a road pavement.

**2. Novel approaches to toxicity testing in *Daphnia magna*<sup>vi</sup>**

1. FT-ICR MS metabolomics was determined to be a feasible approach for toxicity testing of both whole-organism homogenates and haemolymph of *D. magna*. It is capable of discriminating between life-stages of *D. magna* as well as determining toxicant-induced metabolic effects. Highly predictive multivariate classification models were capable of significantly discriminating between four different toxicant MOAs; achievable in both haemolymph and whole-organism extracts, with the latter being the more information-rich sample type. Multivariate regression models were predictive of reduced reproductive output in *D. magna* following toxicant exposure, and determined that a metabolic biomarker signature was significantly able to predict the reproductive output of *D. magna*.
2. Ultimately this research has concluded that an FT-ICR MS metabolomics approach for use in regulatory toxicity testing using *Daphnia magna* is both viable and can provide valuable information.
3. Ecotoxicogenomic techniques have been proposed as having the potential to overcome the current limitations, providing greater mechanistic information for ecotoxicological testing.
4. Current regulatory risk assessment strategies have several limitations, such as linking subcellular changes to higher-level biological effects, and an improved knowledge-based approach is needed.
5. In this thesis, metabolomics is explored as a novel method for toxicity testing using *Daphnia magna*. Initially I evaluated the potential application of Fourier transform ion cyclotron resonance mass spectrometry (FT-ICR MS) based metabolomics for use in regulatory toxicity testing. Subsequently, I aimed to use this approach to discriminate between toxicant modes of action (MOA) and to link toxicant induced metabolic effects to reduced reproductive output in *D. magna*.



**B LANGUAGE****Task 6**

Write in the correct verb forms of the verbs in brackets in the abstract<sup>vii</sup> below:

Hint: One form is passive! *Most* forms are present tense.

This thesis (1) \_\_\_\_\_ (**describe**) the research and development into a range of time-temperature integrators (TTIs) for the measurement of process values for food heat treatments. The TTIs (2) \_\_\_\_\_ (**base**) on the first order thermal degradation of bacterial  $\alpha$ -amylases. Two new TTIs are described, one for mild pasteurisation treatments of a few minutes at 70°C and one for full sterilisation of >3 minutes at 121.1°C. Examples are given of how these TTIs are applied to a variety of industrial thermal processes. These (3) \_\_\_\_\_ (**include**) traditional methods such as canning, but also more complex systems such as tubular heat exchangers and batch vessels, together with novel systems such as ohmic heating. Some of the industrial experiments (4) \_\_\_\_\_ (**deal**) with processes in which the thermal effects (5) \_\_\_\_\_ (**not be**) \_\_\_\_\_ previously quantified.

For sterilisation, a highly innovative solution is required. A candidate TTI material is identified based on an amylase secreted by the hyperthermophilic microorganism *Pyrococcus furiosus*. This microorganism (6) \_\_\_\_\_ (**exist**) in extreme conditions where it (7) \_\_\_\_\_ (**metabolise**) in boiling volcanic pools; with elemental sulphur readily available, in water of high salinity, and in a reducing atmosphere. The amylase it secretes is naturally thermostable and withstands a full thermal sterilisation process.

**KEY****Task 1**

- a. Report the procedure and/or aims
- b. Report findings and claims based on findings
- c. Suggest how other research supports present findings (or vice versa)
- d. Suggest limitations of procedure or findings
- e. Propose implications of the findings
- f. Make recommendations (usually more specific implications)
- g. Make recommendations about future research

A

**8.4. Conclusion<sup>viii</sup>**

(a) The thesis has reported the relationship between posture, seating and muscle activity among dentists and dental students.

(b) The dentists and the students using the CS have followed a similar pattern and are reported here:

- Poor posture increasing the RULA risk scores
- Increase in level of pain through the workday, especially the back, neck and shoulders.
- Increase in muscle activity (percentage MVC) during dental work
- Increased neck flexion angles during dental work contributing to neck pain

(b) The dentists and dental students using the Bambach Saddle Seat followed a pattern opposite to the dentists and dental students using the conventional seat, namely:

- Good posture decreasing the RULA risk scores
- Decrease in level of pain through the workday
- Lower muscle activity (percentage MVC) during dental work
- Neutral neck flexion angles during dental work resulting in lower incidence of neck pain.

(b- claim/e) This thesis has established the relationship between posture, seating and muscle activity and indicates that use of an ergonomic aid (dental operator stool) may improve posture, decrease pain and muscle activity and may decrease the development of musculoskeletal disorders among dental students and dentists.

B

**7.4 CONCLUSIONS**

[Finally, improving treatment is a crucial element in improving survival for breast cancer patients.] ...

(b) In the current study clear improvements in treatment in line with recent guidelines were evident. However, variation in treatment across the region indicated possible inconsistency in clinical practice. (f/g) This variation will now need to be examined using standard population based cancer registration data. (c) The lack of survival advantage for women treated by high caseload surgeons, or of a difference in the use adjuvant therapy according to caseload, is contrary to the recommendation made based on research by the COG. (g) Further work will therefore need to be carried out in this area to assess whether caseload is a valid indicator of high quality care and improved patient outcome.

**Task 2****Conclusion:**

Despite all of the adjustments, the female rate of drug acquisition remains slightly higher especially in younger age groups. Thus, it is likely that [*notice the cautious language*] both physical and psychosocial factors influence the way in which men and women perceive, label and respond to their needs and symptoms, and the way in which physicians respond to their patients.

**Recommendation:**

However, as researchers continue to investigate these issues, it is critical that they collect more objective and detailed data and that **they disaggregate the types of patients, diseases, symptoms and drugs being investigated.**

**Other ways of expressing the recommendation:**

a) In future studies more objective and detailed data should be collected and **the types of patients, diseases, symptoms and drugs being investigated should be disaggregated.**

b) More work needs to be done in this area; data should be collected more objectively, and the types of patients, diseases, symptoms and drugs being investigated need to be disaggregated.

**Task 3**

**The tense in the conclusion was mainly the simple present, as the writer presents the results as facts based on evidence.**

**6.1 Current Class E Project****6.1.1 Steady-state solutions**

Two new analyses of steady-state operation of the Class E power amplifier have been [1. present perfect, links past time (the writing) with the present (the presentation of the writing) presented in Chapter 3. They use [2. simple present, fact about the analyses] different techniques and apply to different, but overlapping, domains characterised by circuit Q and normalised carrier frequency. Both analyses extend [2] existing theoretical knowledge of the circuit and provide [2] useful information for practising electronic engineers who wish to design a Class E amplifier.

The key findings from the first (power series) analysis are [2] expressions for component values for finite Q circuits, and an estimate of the unwanted harmonic output. These were previously only known [3. past, at a time before this study] from numerical solutions at spot values of Q and frequency. The existence of the power series solution confirms [2] that exact Class E conditions are [2] possible for finite Q, but no longer coincide [2] with peak efficiency. This analysis also gives [2] expressions for the carrier frequency response, but for most purposes these are [2] superseded by those obtained by considering energy conservation. Finally, the power series analysis gave rise to [4 describing the procedure, what the researcher did] the insight that the role of the drain feed choke is [2] simply to feed a current into the rest of the circuit; this then led [4] to the amplitude modulation theory given in Chapter 4.

The significant results from the second (energy conservation) analysis are [2] simple rational functions giving the frequency response of the Class E PA over the entire central region. This fills [2] a long-standing knowledge gap, which may [hedging] have seriously limited [1. describing the result of something that happened in the past] the practical usefulness of this circuit.

...The expressions from the first analysis provide [2] results which agree with published numerical solutions. The findings of the second analysis agree [2] with published solutions and measured data.

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**Task 4****Abstract 1**

(a) It is often assumed that women received more prescribed drugs because they have different attitudes towards illness and medical care, high anxiety and more time to visit physicians, or because physicians are biased. (b) This study examines an alternative explanation, that is, much of the excess is associated with women's reproductive role. (c) The study involved a detailed audit of the medical and pharmacy records of 862 men and women. (d) Results showed that women received more prescribed drugs during the 2-year study period. However, the differences between men and women were not the same for all age-groups. As expected the differences were most apparent during the peak child-bearing years. Further analysis showed that the gender differences were virtually eliminated after excluding women with female-specific diagnoses and excluding the drug categories used to prevent or treat female-specific conditions. (e) Previous studies based on gross measures of self-reported drug use seem to have underestimated the importance of factors that relate to women's reproductive role.

**Abstract 2**

(b) Atomic absorption (AA) analysis was employed to determine, (a) for the first time in this country, lead concentrations in aerosols (c) collected in Nuclepore filter media during the months of February and March (1980) in Guatemala City, Guatemala. (c) In particular, the lead in the atmospheric fine particulate was measured in different downtown locations around noontime and in a single location at 1-h intervals throughout the day. (b) The first was used to study short-term variations from one location to the other, and the second one was used to correlate parameters such as traffic density and wind velocity with the levels of airborne lead on the same day. (b) In addition, this paper presents a brief discussion of the lead content in Guatemalan gasoline, the lead levels in street dusts, and the total suspended particulate matter in downtown Guatemala City.

**Task 5****Correct order abstract 1: 2-4-3-1****Mix Design For Tropical Areas Employing The Wheel Tracking Test**

Of the two main methods of pavement failure, namely cracking and rutting, the most common mode of failure in the Middle East is through extensive rutting.

As yet there is no acceptable and readily available, on site, method of evaluating asphaltic mixes to determine their resistance to permanent deformation when laid in a road pavement.

The dissertation investigates the various mechanical means of evaluating asphaltic designs for tropical countries with particular reference to the Wheel Tracking Machine.

The effect on the properties of bitumen by the addition of varying quantities of filler to produce a mortar is investigated together with the effect of bitumen/ filler ratios by weight on Marshall test values.

**Correct order abstract 2: 4-3-5-1-2****Novel approaches to toxicity testing in *Daphnia magna***

Current regulatory risk assessment strategies have several limitations, such as linking subcellular changes to higher-level biological effects, and an improved knowledge-based approach is needed.

Ecotoxicogenomic techniques have been proposed as having the potential to overcome the current limitations, providing greater mechanistic information for ecotoxicological testing.

In this thesis, metabolomics is explored as a novel method for toxicity testing using *Daphnia magna*. Initially I evaluated the potential application of Fourier transform ion cyclotron resonance mass spectrometry (FT-ICR MS) based metabolomics for use in regulatory toxicity testing. Subsequently, I aimed to use this approach to discriminate between toxicant modes of action (MOA) and to link toxicant induced metabolic effects to reduced reproductive output in *D. magna*.

FT-ICR MS metabolomics was determined to be a feasible approach for toxicity testing of both whole-organism homogenates and haemolymph of *D. magna*. It is capable of discriminating between life-

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stages of *D. magna* as well as determining toxicant-induced metabolic effects. Highly predictive multivariate classification models were capable of significantly discriminating between four different toxicant MOAs; achievable in both haemolymph and whole-organism extracts, with the latter being the more information-rich sample type. Multivariate regression models were predictive of reduced reproductive output in *D. magna* following toxicant exposure, and determined that a metabolic biomarker signature was significantly able to predict the reproductive output of *D. magna*.

Ultimately this research has concluded that an FT-ICR MS metabolomics approach for use in regulatory toxicity testing using *Daphnia magna* is both viable and can provide valuable information.

**Task 6**

This thesis 1. **describes** the research and development into a range of time-temperature integrators (TTIs) for the measurement of process values for food heat treatments. The TTIs 2. **are based** on the first order thermal degradation of bacterial  $\alpha$ -amylases. Two new TTIs are described, one for mild pasteurisation treatments of a few minutes at 70°C and one for full sterilisation of >3 minutes at 121.1°C. Examples are given of how these TTIs are applied to a variety of industrial thermal processes. These 3. **include** traditional methods such as canning, but also more complex systems such as tubular heat exchangers and batch vessels, together with novel systems such as ohmic heating. Some of the industrial experiments 4. **dealt** with processes in which the thermal effects 5. **had not been** previously quantified.

For sterilisation, a highly innovative solution is required. A candidate TTI material is identified based on an amylase secreted by the hyperthermophilic microorganism *Pyrococcus furiosus*. This microorganism 6. **exists** in extreme conditions where it 7. **metabolises** in boiling volcanic pools; with elemental sulphur readily available, in water of high salinity, and in a reducing atmosphere. The amylase it secretes is naturally thermostable and withstands a full thermal sterilisation process.

**Further reading:** Swales J. M., and Feak, C. B. (1994) "Academic Writing for Graduate Students: a course for non-native speakers of English." Ann Arbor: University of Michigan Press ISBN: 0-472-08263-9

<sup>i</sup> Taken from <http://etheses.bham.ac.uk/216/1/Gandavadi08PhD.pdf>

<sup>ii</sup> <http://etheses.bham.ac.uk/207/>

<sup>iii</sup> <http://etheses.bham.ac.uk/3/1/Kimber06PhD.pdf>

<sup>iv</sup> Samraj, B (2005) An exploration of a genre set: Research article abstracts and introductions in two disciplines. *English for Specific Purposes* 24, pp. 141-256.

<sup>v</sup> A. Lee M Y and Ray MC (1987) Return intention of students from four developing countries *International Review of Education*, 33, p. 75

B. Adapted from Bottino, R M (2007) On-line networks: Framework and scenarios. *Education and Information Technologies* 10

C. Schleppegrell M. and Royster. L. (1990) Business English: an international survey. *English for Specific Purposes*, 9, p. 3

D. Sintim-Aboagye, H and D. R. Tufte (2006) Central Bank Independence, Inflation Variability, and the Revenue Smoothing Hypothesis. *International Advances in Economic Research* 12, pp147-160

<sup>vi</sup> <http://etheses.bham.ac.uk/668/>

<sup>vii</sup> <http://etheses.bham.ac.uk/144/>

<sup>viii</sup> Taken from <http://etheses.bham.ac.uk/216/1/Gandavadi08PhD.pdf>