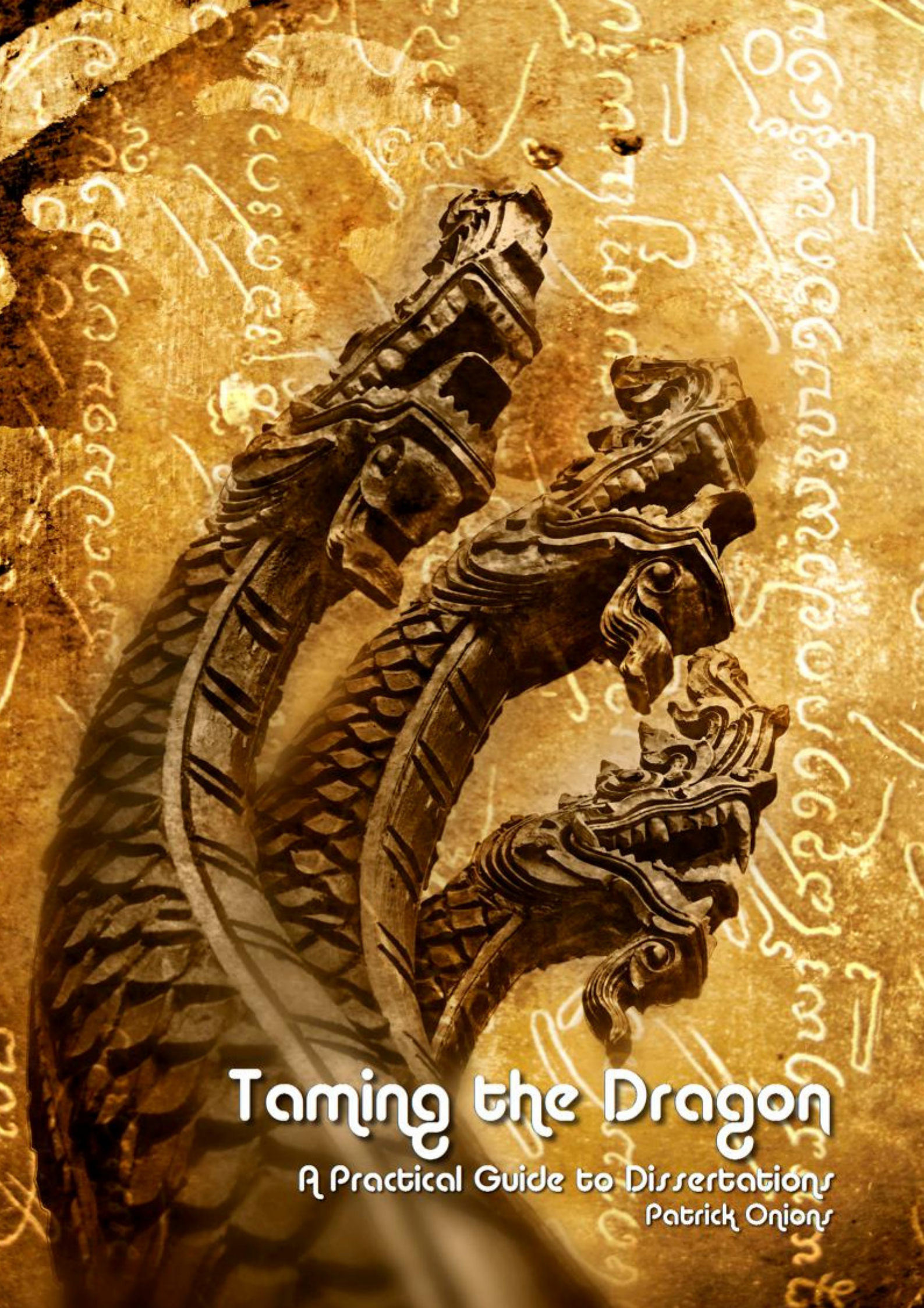


The background of the cover is a textured, golden-brown surface resembling aged parchment. It is covered with faint, flowing cursive script in a light gold color. Three ornate, golden dragon sculptures are arranged diagonally across the center. Each dragon has a highly detailed, scaled body and a fierce, open-mouthed head. They appear to be part of a larger architectural or decorative structure.

Taming the Dragon

A Practical Guide to Dissertations
Patrick Onions

Taming the Dragon

A Practical Guide to Dissertations

Patrick Onions

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About this book

Teaching and supervising indicate that students tend not to engage with research textbooks and many important research activities. Their criticisms often center around the impenetrable literature, the complexity of the body of knowledge and the lack of a simple process to follow.

This book provides undergraduate and Masters students in the United Kingdom (and elsewhere) with an easily digestible guide to completing their dissertations. A pragmatic process of fifty straightforward tasks is presented that lead the reader one step at a time from the first research lecture to final submission. Clear descriptions, straightforward choices, suggestions and recommended literature are included.

Using this book

This book is meant to be read in its electronic format and has been locked to prevent content extraction, copyright infringement and changes to the document. An unlocked version with offset layout is available from Electron Journal to allow A4 duplex printing and binding.

Students and tutors should simply work through the guide a chapter at a time and complete the tasks as they are encountered. There may be some iteration or repeating a cycle of steps, but generally sections can be read and crossed off as you go. Making notes will usually not be necessary and you can write the dissertation document as you proceed. By the end of Chapter 9 you should have completed your proposal, and ethics form, and by Chapter 15 the dissertation will be complete.

About the author

I am a practitioner and academic who has worked in Africa, Asia and Europe. I've consulted to a wide range of organisations in project management, information technology, knowledge management and business management; as well as lectured project management, information technology and knowledge management to Cambridge University and Leeds Metropolitan University students. My qualifications include an MSc in Information Systems, an MBA, and a PhD in Knowledge Management.



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This guide has gained much from the knowledge and experience of colleagues at Leeds Metropolitan University's Centre for Project Management. Particular mention must be made of material supplied by Mark Laurillard and ideas generated by the team at the Centre whilst supervising many dissertations. All these contributions are gratefully acknowledged.

Addendum and corrections

This book was originally made available in September 2010 as an online draft. After nearly one thousand downloads by readers from all over the world, it has been updated and numerous suggestions incorporated. Main changes to the original draft version include:

- Content has generally been revised in all chapters.
- The role of the supervisor has been elaborated on in section 4.1.
- A Q&A section has been added in Appendix 4.
- A glossary has been added at the end of the guide.
- An alphabetic index has been added at the end of the guide.
- References and web links have been updated.
- Appendices have been revised.

The original PDF file name has not been changed to maintain continuity. Please contact the author or Electron Journal with constructive feedback or other enquiries.

I Introduction

The quickest and easiest way to prepare and pass your dissertation is to do things right!

Many research textbooks do not make it easy for an undergraduate or Masters student to study the subject of 'research'. They are often structured around research concepts and discuss these in a philosophical manner, forcing students to digest a large amount before they begin to make useful progress. In practice this means that students may wander aimlessly for a long while before getting under way. Struggling like this builds apathy towards the project and distaste for research, rather than the enthusiasm and interest that a dissertation deserves.

Lectures and supervision on the other hand cannot replace the depth and breadth that a textbook can deliver. Tutors can only provide the briefest of introductions in the limited number of lectures available. Supervisors expect tutors to cover the basics, and do not have the time to coach individual students through their dissertation. Everyone with the frequent exception of the student expects students to study independently.

Students need to acquire knowledge and skills in three broad areas to complete their dissertation: (i) how to write a dissertation, (ii) how to research, and (iii) a good understanding of their research topic. In order to do so successfully, they will also need to apply a variety of skills like reading, writing and critical thinking. This guide aims to bridge any gaps between module guides, lecture notes and conventional research textbooks by providing or pointing to the right knowledge in a practical way.

A series of fifty tasks are provided to guide a student in preparing their dissertation from topic selection to final submission. A process approach has proven to be the quickest, most accurate and most reliable way to teach a person complex and difficult tasks. Clear step-by-step instructions allow students to know what to do next and to learn whilst performing those tasks. This is quicker than reading-then-applying, students are not overwhelmed with an enormous volume of information before they begin, and the explicit instructions offer standards and measurement criteria. The outcome is ideally improved comprehension, greater clarity about the subject and the process, more positive attitudes towards research and most importantly, more efficient completion of the dissertation and better grades. For tutors and supervisors, knowledge and experience may easily be plugged into the process at the appropriate step.

There is little doubt that this approach will greatly concern many traditionalists. It may be argued that modern universities teach future practitioners subjects that are usually more grounded in practice than in theory. At the undergraduate or even Masters level, focus should probably be on acquiring useful skills rather than on developing a deep philosophical understanding.

Simplification is useful for educating difficult or theoretical subjects: trimming off philosophical fat, stripping peripheral knowledge away to concentrate on core concepts. The goal is always to complete the dissertation in the most efficient and effective manner possible. To do so, the intention is to provide engaging and useful instruction, to enable students to accomplish more in the time available, to help students focus on their topic and its research (rather than on the subject of research itself), to help students enjoy their research, and to present research as a useful skill rather than a broad and convoluted academic exercise.

This guide is admittedly not for everyone, but no excuses are made for trying to turn what is usually regarded as a dense and trying undertaking into an accessible and manageable adventure. A dissertation is a difficult dragon, and knowing the beast and the arts of dragon-slaying will make it easier for anyone to battle it effectively. This does not guarantee an effortless journey, just better and more reliable outcomes.

1.1 The advantages of submitting a good dissertation

A dissertation is a lot of work, and it comes at the end of a long period of study. Students find it difficult to find motivation and justify the amount of work that goes into a good dissertation. Common complaints are that the dissertation forces students to study a subject (research) that is not related to their field, that the student does not intend to become an academic, and that the student will never 'research' again. Why bother?

This chapter does not intend to provide trite motivational sound bites. If completing your degree is insufficient incentive to get down to work, draw comfort from knowing that thousands of students every year feel exactly the same and yet struggle their way through their projects to successfully complete their degrees.

On the other hand, there are numerous benefits to completing and submitting a good piece of research. Stretch yourself; don't aim for a scrape-through pass:

- Academic reasons:
 - A dissertation is an important test of a student's broad understanding of their chosen field.
 - It is an opportunity to draw together those subjects studied in separate modules.
 - More students are completing university today than ever before, so you need good results to stand above the crowd.
 - Good ideas should be published, and publications are useful. Not only do they provide travel opportunities; they establish your credibility as an expert, validate your research, and you get to meet interesting and useful people.
 - A dissertation is an opportunity to learn a lot more about a topic that interests you, to specialise in your field, or to explore a problem you may have encountered. Most degrees are quite prescriptive in their content, so dissertations provide an opportunity to those with a keen interest in a particular subject to explore it in great detail. Of course it helps that students tend to do far better when they are interested in their subject.
- Employment opportunities:
 - If you are in doubt as to your future, the dissertation process may very well help you find the path you've been looking for.
 - You can tailor your topic to suit your career. Employers do value experience, but good research can demonstrate you know your subject. Reading about a subject from a particular perspective results in a better command of the various theories and perspectives, and allow a person to enter a niche field with more credibility.
 - A dissertation is tangible proof that you can design, execute and deliver a project from concept to handover. It contains strong evidence of your ability to write, structure a document and present facts. These are qualities that an employer will value.
 - Use your research to build future prospects. A survey is a useful way to approach potential employers: good questions grab their attention, and a post-completion summary will demonstrate the quality of your work. Research gives students the time and a plausible reason to engage with organisations and showcase their capabilities. Studying problems that are relevant and important to particular organisations can open doors, introduce the student to decision-makers and important contacts, and leapfrog a student over other job applicants.
 - Publishing BSc or MSc research at conferences or in journals not only looks good on the resume; it can lead to job offers and international travel.

- Research may be used to record, reflect on and improve one's personal experience that may have been gained through gap-year placements, previous employment or current employment. Reflecting on one's work is an opportunity to learn and grow, and provides a ready source of data. Students wishing to use their work experience will read more in Chapter 5.
- Students may work in their chosen field for 40 or even 50 years. The skills they learn whilst completing their dissertation will:
 - Help them keep abreast with the ongoing changes and developments in the field.
 - Solve problems and develop solutions useful to their employer and other practitioners.
 - Allow them to identify and debunk poor ideas, bad research and charlatans.
 - Allow them to reflect and improve on their own performance.
- Acquiring new and useful skills:
 - Resourcefulness, flexibility, creativity and self-confidence¹.
 - The ability to thoroughly investigate, explore and understand a concept.
 - Logic, critical thinking and building a sound argument. The ability to think critically and evaluate are valuable business skills, with professionals making big and life-saving decisions every day. The value of efficient investigation and problem solving is not to be underestimated. The cost of poor decision-making is equally high and, aside from being entertaining, Ben Goldacre's book *Bad Science* is crammed with industry examples that could have been prevented by applying basic research skills.
 - Research skills, highly prized in commercial and academic research where organisations usually require good marks, independent research skills, knowledge of research methodologies, an ability to critically analyse a situation and evaluate other research
 - The ability to publish one's thinking and findings.
 - Various analytic techniques.
 - Looking at a phenomenon and drawing appropriate, valid conclusions.
 - Communication of ideas and the ability to write, particularly when prospective employers are seeking to recruit staff with those abilities
- Personal reasons:
 - Completing a major endeavour like a dissertation is good for the ego and for your confidence. It's part of your personal development. You will feel more empowered to take on bigger things, approach the unknown with less trepidation, and have a better sense of what you are capable of.
 - People have helped you along the way, either academically or in the form of support from family and friends. A good dissertation shows them their efforts were worthwhile.

1.2 The role of this guide

This guide is aimed at the average undergraduate and Masters student studying at a UK university and about to embark on their dissertation. It is an instructional handbook, explaining the overall process whilst not being authoritative or comprehensive. And its primary purpose is to help students of all abilities to successfully complete their dissertation.

¹ Collis and Hussey (2009, p.22)

This is an alternative for anxious or unconfident students. A complex subject like research or a challenging project like a dissertation can intimidate novices. One of the key reasons why a step-by-step approach was chosen was to reduce the detail and scope that the student has to deal with at any one time. You don't need to know all about research or even to have a clear understanding of how to research your topic before starting a dissertation!

Following a clearly outlined process is also a lot more efficient. Figuring out how to do something whilst discovering the necessary knowledge is time consuming and error-prone. This guide is suited to those wishing to complete their dissertation with the least amount of effort or in the shortest period of time. In these situations it is better to have a safe alternative to plagiarism, a cheaper alternative to employing a ghost-writer, and a simpler method of doing it the old fashioned way!

No book can replace lectures and tutorials, and reading is not an excuse to avoid lectures! Interaction with academic staff is vital for the transfer of knowledge and building the relationships needed for successful completion. Interaction with academics conveys tacit knowledge about the expectations of supervisors and examiners, the best resources to use, examples and models to follow, and points of knowledge and logic clarified. On the other hand this supplements or may even replace the module guide and lecture notes provided by tutors. More detail is included here than is typically contained in lectures, and the step-by-step approach is employed to uniquely guide and inform the student whilst they work.

Written instructions cannot replace supervision. Supervision is used to steer students, correct problems as they appear, provide expert advice, suggest new knowledge and logic, gauge progress and even weed out plagiarism.

Research and even dissertations are extensive subjects that individual books can never completely cover. Students will still have to open a research textbook. With this guide the intention is to limit your reading to a single chapter or section every so often - rather than digesting everything from cover-to-cover. Importantly the approach provided here does not expect the student to study extensively before they commence their journey. In fact, starting is as easy as turning the page to Chapter 2.

Information is provided about what choices need to be made at each step. Suggestions will be made about what needs to be done based on the author's experience in supervising dissertations. Students will also be pointed to recommended literature, and advised what skills they need to start acquiring and using at that moment.

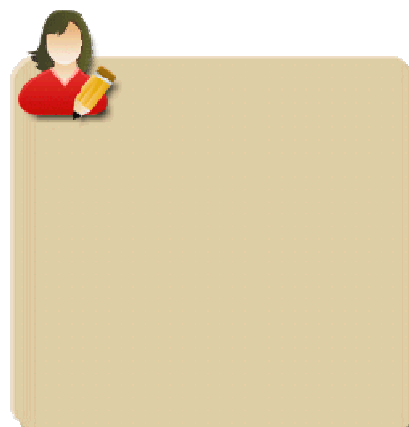
Whatever your reason for choosing this guide and however you choose to go about it, it is hoped that the dissertation that emerges is produced more quickly, with less trauma, of higher quality and ultimately a more enjoyable experience.

1.3 About the tasks

The process presented here consists of fifty tasks, activities that should be performed one at a time as you read through the chapters. Each chapter covers a key phase in the dissertation project, and each chapter involves one or more tasks that will take you further down the road to completion.

Each task will be presented in a box as shown on the right. Tasks are also numbered, and a table of tasks appears in the contents section of this guide.

It is recommended that you read each chapter to understand what it covers and what you will be required to do. Read any recommended literature if you need to improve your knowledge. Then promptly complete the tasks and reflect on



how well those tasks were completed. It is advisable to discuss your progress with your supervisor, even on a chapter-by-chapter basis if that is acceptable. Move on to the next chapter. You should have completed a viable dissertation once all of the tasks are completed in order and to the best of your ability.

1.4 Recommended reading

As mentioned, this guide is not a replacement for the enormous wealth of literature available on research or researching your chosen topic. Students (and tutors) should not use this as a reference for research methods, writing dissertations, or for critical thinking. The contents of this guide alone will probably be insufficient to achieve a good grade. You will need to read further afield to improve the quality of your dissertation.

Each chapter concludes with a recommended reading section, offering further material for those wishing to know more about the issues discussed in that chapter or those who are experiencing difficulty in completing it. The remainder of this section provides a list of literature that may be of general use.

The appendices offer some useful material, especially the Q&A in Appendix 4. There is a Glossary at the back, as well as an Index.

Students wanting to understand more about the **philosophies** underpinning this guide are encouraged to review the following:

- Bailey, B.P. (2006) *Perception and Cognition*
- Goldacre, B. (2008) *Bad Science*, Fourth Estate, London
- Lovaglio, D. and Kahneman, D. (2003) "Delusions of Success", *Harvard Business Review*, July
- Sutherland, S. (1998) *Irrationality*, Pinter and Martin

The textbooks below are recommended to students who are looking for instruction on the **skills needed** to complete a dissertation:

- Cottrell, S. (2005) *Critical Thinking Skills*, Palgrave Study Skills
- Murray, R. (2002) *How to write a thesis*, Open University
- Northedge, A. (2005) *The Good Study Guide*, Open University Press
- Onions, P.E.W. (2009) "Thinking Critically: An introduction"

The following textbooks are recommended to students who are looking for general textbooks that provide more detail on the **issues discussed** in this guide:

- Blaxter, L., Hughes, C. and Tight, M. (2001) *How to Research*, Open University Press
- Collis, J. and Hussey, R. (2009) *Business Research*, Palgrave Macmillan

The books below are recommended to students looking for manageable reference books on **business and general research**:

- Bryman, A. and Bell, E. (2003) *Business Research Methods*, Oxford University Press
- Saunders, M. Lewis, P. and Thornhill, A. (2000) *Research Methods for Business Students*, FT Prentice Hall

2 The purpose of a dissertation

Dissertations are unfamiliar territory for most students. First there is the combination of strange subjects and new skills. Then there is the lack of precise direction and clear criteria for completing the work. And finally there is the need to be self directed, motivated and disciplined over a protracted period of time. Few students are adequately prepared for what lies ahead, and many students procrastinate because they underestimate the amount of work entailed or are overwhelmed by the volume of work.

i Useful tip: Don't skip through this chapter! It will prepare you for the project by explaining what your examiners expect, and save you a lot of time and energy in getting there.

2.1 What is research?

Assuming this is your first foray into research, it is quite conceivable that you see research as white laboratory coats, hours of mind-numbing reading, and lots of scary statistics. Many students feel the same way, and the way that research and dissertations are taught can reinforce that impression.

Defining research will give you a broad idea about what is involved and what is expected. Unfortunately finding a suitable definition is not as simple as opening a dictionary or typing a query into Google². Research is rife with terminology that can be confusing to those not familiar with the vocabulary, but using the correct words does help explain a complicated subject quickly and accurately. A visit to the library is usually inevitable, but to get you on your way the following definition has been derived from a selection of definitions found in opening chapters of a couple of research textbooks:

Dissertation research is a self directed project in which a student chooses a topic, methodically investigates it, draws suitable conclusions, presents the work and achieves a grade to complete their degree.

This is a dissertation-centric definition. It does point to the purpose of research in academia and industry, investigating and knowing more about ideas, hypotheses, problems, situations, a field or even theory that explains the world. And it also shows it is about doing so in a way that allows the researcher and their audience to be confident in the findings. Most importantly however, this definition is about what should concern a student the most, successfully completing their degree.

Undoubtedly there are problems with a short definition such as this one. It could have been loaded with words like 'systematic' and 'rigorous', but that could prove troublesome because there are many other words like 'methodical' or 'ethical' that also beg to be included. A simple definition cuts to the heart of the matter without clouding the issue or trying to show how brilliant the author is.

Nevertheless, the educational aspects of student research are not to be underestimated. Students will be given the opportunity to learn useful skills along the way that will serve them in their professional careers, and hopefully they will recognise the value in solving a problem or testing their ideas in a systematic manner. Again, the practical approach adopted here is designed to facilitate that learning.

² As an aside, students at Bachelors and particularly at Masters levels are advised to avoid dictionary definitions. They tend to be too generic and simplistic, and are not intended for the deep scholarly purposes of a dissertation.

2.2 Module requirements

A dissertation is a mandatory step in your degree and involves planning and executing an investigation by yourself. You are probably wondering what is required to finish it quickly.

Don't guess. Don't listen to your friend's cousin who completed his degree three years ago. The most efficient route to completing a dissertation is to target the course requirements that have been formally set out by your tutors. The dissertation module documentation will include module aims, assessment criteria and various instructions that should be adhered to. Do exactly what is asked of you and don't be creative or take shortcuts. This will minimise the amount of rework and unnecessary effort, deliver exactly what the examiners want to see to give good grades, and probably make the whole process a lot more pleasurable for you.

University education is designed with 'learning outcomes' in mind; a "*statement(s) of what a learner is expected to know, understand and/or be able to demonstrate at the end of a period of learning*" according to various sources quoted in Adam (2004). Learning outcomes should be the foundation for the expectations of academics and students. Learning outcomes are usually based on the university's general academic regulations and policies, and these are in turn informed by experience, policies and theory. Faculties and course leaders may then tailor these general outcomes to suit the field of study. Students are encouraged to locate the "module aims" and "learning outcomes" in the course documentation or obtain them from their tutor.

A typical **aim** for a dissertation module is "*to deliver an in-depth, reasoned and coherent analysis of a topic relevant to the student's course or profession in an appropriate format*". This has implications for the dissertation and its preparation:

- The chosen topic must be relevant to the course or degree's field of study.
- The literature review and empirical research should be comprehensive and thorough.
- Argument and logic should be sound, rational and clear.
- The dissertation's structure needs to be well thought out and logically ordered.
- The dissertation and its contents must be submitted in the approved format.

Typical **learning outcomes** for a dissertation module will require a student to be able to, and to be assessed on their ability to:

- Design and execute a research project.
- Identify and propose a researchable topic.
- Understand and apply an appropriate research methodology and method.
- Critically acquire, analyse and evaluate relevant information.
- Explore, derive and test hypotheses, problems or situations.
- Draw appropriate conclusions and draw recommendations.
- Communicate knowledge and analysis effectively.
- Cite and reference the work of others correctly.

Students are therefore expected to acquire, display and improve their range of skills and knowledge in areas like planning, time management, design, reading, comprehension, synthesising, critical thinking, researching, analysing, evaluating, writing and communicating.

2.3 Assessment

Assessment refers to the process of evaluating and grading your work. It is a planned activity, meaning your examiners will have a defined set of criteria by which they will judge your work. This information is made available to students so they know what the goal posts are. Assessment information also provides a list of subjects and concepts that should be studied, a checklist that can guide and self-assess the project, and may even suggest a structure for the

dissertation. Four types of assessment information are usually available in the course documentation, module handbook or research module notes; the assessment breakdown, general quality characteristics, grading criteria, and marking schema.

2.3.1 Assessment breakdown

The assessment breakdown describes in broad terms how marks will be allocated. Usually found in the module handbook, this shows examiners and students where emphasis is to be placed. A typical assessment breakdown weights argument and empirical evidence as follows:

Problem statement, methodology and literature review	30%
Argument and evidence	60%
References and presentation	10%

It is sound practice for students to consider the assessment breakdown and apportion their time and effort accordingly.

In contrast to this, experience suggests that many students expend most of their time and effort in choosing a topic, selecting and writing up a methodology, and reviewing the literature. Empirical research usually receives insufficient attention, and findings and conclusions are developed in a rush. Fellow supervisors have even reported single paragraph conclusions.

2.3.2 General quality characteristics

General characteristics describe the basic standards that a dissertation should aim for. These will help in planning the project, designing the research methods, and even reviewing and reflecting on the work in progress.

Collis and Hussey (2009, p.15) offer a useful comparison of good and poor dissertations, described in Table 1 below.

Criteria	Good project	Poor project
Research problem, scope	Sharply focused. Related to academic debate.	Unclear and unfocused.
Literature review	Critical evaluation of relevant, up-to-date literature. Linked to focused, feasible research questions.	A list of items. Relevance unclear. Little or no evaluation. Research questions missing, impractical or unfocused.
Methodology	Cohesive design. Excellent review of research design options. Linked to the literature.	Little appreciation of research design. No justification of choice. Not linked to the literature.
Analysis and discussion	Clear findings discussed analytically. Generates new knowledge or insight. Linked to the literature review.	Unclear findings. Unrelated to research questions. Little or no attempt to relate to literature review.
Conclusions	Conclusions clearly linked to research questions. Attention paid to implications and recommendations.	Some conclusions. Not linked to research questions. Implications and limitations of results not addressed.
Referencing	All sources cited. Full bibliographic details provided. Correct system applied.	Poor citation and missing references. Plagiarism through omission or inadequate referencing.
Communication	Clear flow of ideas. Appropriate spelling and grammar.	Difficult to follow. Many spelling and grammar mistakes.

Table 1: Characteristics of good and poor dissertation projects

This guide has been written for Bachelors (undergraduate) and Masters level students. Although the format and structure may be the same for both levels, there are some fundamental differences between the two levels that will impact on the work involved and the grade earned.

Each university and faculty sets out the requirements for the different levels of dissertations in their academic regulations and policies. Table 2 below assembles and compares a typical range of these differences, and students are advised to confirm what the requirements are for their particular course.

Aspect	Bachelors degree	Masters degree
Critical thinking	Descriptive. Critical analysis.	Evaluating. Critically analytical.
Topic and research problem	General issues facing the field. Emphasis on learning, understanding. Looks at the breadth of the subject.	Topical, pressing problems. Emphasis on theory building, problem solving, situational change. Looks at the subject in depth.
Research methods	Awareness of methodologies and methods. Building essential research skills. May apply an exemplar, paradigmatic or commonly used method without much critique or justification.	Awareness of methodologies and methods. Selection and use of the right tools and skills. Informed selection of appropriate methods and techniques.
Literature	Awareness of relevant, general theories, concepts and debates Weakly critical. Informs the hypothesis, research questions. Some use of some journals and conference proceedings is expected.	Comprehensive review, with strongly critical comparison of key relevant theory, concepts and debates. Emphasis on debates and the student asserting their position. Extensive use of recent journal and conference articles is required.
Data selection and collection	Generic convenient subjects. Research questions should be sufficient to answer descriptive questions about the topic. Sample size is determined more by convenience than representation.	Subjects relevant to the research. No student subjects unless the research is about or pertains to students. Research questions must be probing, analytical and supportive of inference. Samples should be representative.
Data analysis	Quantitative analysis need only involve descriptive statistical techniques. Informal qualitative analysis techniques are permissible if the analysis is insightful, consistent and discussion is rigorous.	Quantitative analysis should involve descriptive and inferential statistical techniques. Qualitative techniques should be formal, rigorous, well defined and based on theory.
Findings	Valid interpretation of the data. Links findings to questions or hypothesis. Displays correct use of formal analytical techniques.	Valid and insightful interpretation. Links findings to questions / hypothesis, contrasted with literature and evaluated in terms of the student's chosen stance. Displays correct and enlightened use of formal analytical techniques.
Conclusions	No unique contribution to the body of knowledge. Clear links to topic and research questions. Reveals a good general understanding of the subject.	No unique contribution. Clear links to topic, research questions and major contemporary debates. Worthy of publication in academic journals. Reveals deep understanding of the subject. Displays an ability to analyse in an informed and insightful manner. Displays ability to apply the right tools to finding solutions and deriving practical recommendations.

Table 2: Differences between Bachelors and Masters level dissertations

2.3.3 Grading criteria

Breakdowns and characteristics are indicative of what to aim for. Grading criteria are more definitive and describe what is needed to achieve a particular grade. These criteria are level specific and usually provided in the dissertation module handbook.

Table 3 below offers a generic set of criteria taken from one such source. To achieve a particular grade, all the requirements for that grade and those below it should be met.

Grade	Grade requirement
Distinction (70%+)	Objectives of the study are clearly specified. Displays understanding in the choice and use of data collection methods. Imagination shown in the analysis of data collected. Provides a comprehensive and critical analysis of various strengths and limitations. Comprehensive review of literature and critical analysis of key issues. Logical argument displaying academic rigour and original ideas throughout. Thoughtful and reflective in making recommendations. Lucidly, concisely and accurately written. Presentation visually stimulating.
Merit (60 – 69%)	Objectives of study clearly stated. Displays understanding in selection of methods of data collection. Appropriate methods of data analysis selected. Comprehensive analysis of the methodological strengths and limitations of the material. Comprehensive review of the literature and critical analysis of key issues. Presents a cogent, well-balanced argument Appropriate conclusions drawn and recommendations made. Lucidly, concisely and accurately written. Demonstrates good presentation skills.
Pass (40 – 59%)	Objectives of study clear. Limited choice of data collection methods. Adequate analysis of the strengths and limitations of the material. Wide range of the literature, key issues identified. Adequate analysis of findings. Logical argument is offered. Appropriate conclusions drawn and recommendations made. Accurately written. Well presented.
Fail (<40%)	Field of enquiry and objectives of study unclear. Inappropriate choice of data collection methods. Limited analysis of the strengths and limitations of the project. Limited acquaintance with the literature appropriate to the chosen topic. Limited analysis of data. Superficial argument, lacking in structure. Inappropriate conclusions drawn and recommendations made. Poor writing skills. Inadequate presentation of materials.

Table 3. Grading criteria

Students should have a fair idea of the grade they wish to take away for the dissertation, but need to check that it is realistic! Review all the requirements in Table 3 up to and including that grade, and make sure these are taken into account when you design your research. Repeat this review as you are nearing completion of your dissertation too so as to ensure your work meets the desired criteria.

2.3.4 Marking schema

Breakdowns and characteristics provide general direction, but students need a definitive indication of how their work will be marked by the examiners. A marking schema solves this problem and provides a number of following benefits:

- For examiners, a marking schema:
 - Ensures tutors, supervisors and examiners work towards the same goals.
 - Brings clarity to the assessment.
 - Ensures that students on the same course are marked consistently.
 - Ensures less subjective academic judgement.
 - Enables quicker, more methodical and structured marking.
 - Helps the examiner remember the criteria and avoid being distracted.
 - Allows the examiner to break from marking without losing track.
 - Supports focus on particular or important issues.
 - Ensures that assessment is repeatable and reliable.
 - Ensures first and second markers are consistent.
 - Helps prevent and resolve disputes.
 - Supports stronger and more consistent feedback.
- For students, a marking schema:
 - Supports planning and design.
 - Indicates the amount of work required.
 - Provides detail of what to include.
 - It provides a self assessment tool.
 - Sets boundaries to work within, and gives more freedom to explore safely.
 - Removes anxiety about what is expected.
 - Removes anxiety about subjective marking.
 - Removes anxiety about poor relationships with academic staff and examiners.
 - Leads to a better learning environment.

Appendix 1 offers three examples of marking schema, ranging from a basic one to an exhaustive model. Students are advised to refer to their module documentation for a marking schema, and use this when preparing chapters and reviewing their work prior to submission.

 **Useful tip: reviewing the schema and attending to the problem areas in the last two days before submission of your dissertation can usually earn an extra few percent.**

2.4 *Personal goals: how much effort you want to put in?*

A research project will always be a balance between scope, time, effort and quality. Dissertations often end up requiring a lot more work than two modules because students must engage in a broader spectrum of subjects and the work is self-directed. Use the personal benefits in section 1.1, the marking schema in section 2.3 and your first discussion with your supervisor to firmly establish the scope, time, effort and quality (marks) you are aiming for.

One question is how big a problem do you wish the project to solve or how complex a phenomenon do you wish to investigate? Do not forget that the primary objective of a dissertation is to finish it. Overly ambitious topics or complex subjects develop a life of their own and can prevent a student from obtaining a desired grade. It is the student's responsibility to firmly identify with the module leader what the requirements and expectations are, to choose an appropriate topic and to keep their project focused on that topic.

A second question is to establish what grade you want to achieve. A pass, normally 40%, requires identification of the key theories in the area, a fair bibliography and basic empirical research and analysis of just about any subject or problem. On the other hand, a distinction will require a strong problem statement, deep critical review of the literature, good analysis of the data, and plausible, valid conclusions. Clarify your goals with your supervisor once they have been assigned, and listen to their instruction and encouragement.

2.5 In summation

This chapter has discussed the general purpose of a dissertation and how it will be evaluated. Students are advised to bear these points in mind throughout their research as this will make the process more efficient, less confusing and lead to better grades.

Task 1. Time to set the goals!



Take out the module materials and locate the aims, objectives and variety of assessment information. Prepare a checklist that can be used to self-assess your own dissertation as you write it, with sufficient detail to leave you confident that you are achieving the grade you desire.

Also consider your personal objectives. Why are you doing this dissertation, and what do you wish to accomplish? If you want to do more than just to pass the module then prepare a two-column table to list your objectives and note some ideas about how to achieve each one. You will also use this in Chapter 5 for topic selection.

2.6 Recommended reading

More information about the issues discussed in this chapter may be found in:

Collis, J. and Hussey, R. (2009) *Business Research*, Palgrave Macmillan

Draper, S. (2010) "Taxonomy of learning aims and objectives", *University of Glasgow*, online <http://www.psy.gla.ac.uk/~steve/best/bloom.html>

Goldacre, B. (2008) *Bad Science*, Fourth Estate, London

Green, D. (2006) "Bloom's Taxonomy, Guide to Learning Outcomes", *UCE Birmingham*, online <http://www.ssdd.bcu.ac.uk/outcomes/UCE%20Guide%20to%20Learning%20Outcomes%202006.pdf>

3 The Format of a dissertation

The previous chapter described dissertation research as an investigation and explained ‘*why*’ these activities are to be carried out. Your aims and objectives must now be translated into practical action, and the first step is to understand the forms that a dissertation can take.

A dissertation’s structure may be described in several ways. It is a **project**, and like all projects it has a beginning, an end, and various phases or activities in between. A dissertation is also a **process**, a set of activities that convert ideas, goals and knowledge into a tangible academic product. Dissertations have been described as a **conversation** between the student and their examiners. This conversation will flow as a series of **chapters**, with content arranged in a **discourse** that binds the various concepts and subjects together into a well-ordered discussion. Finally, the dissertation must also be seen as an academic **argument** that employs a series of logical statements to arrive at an appropriate conclusion.

Research is a complicated activity and dissertations are complex documents. Seeing the big picture is vital, and the various dissertation formats will give you a good practical understanding of ‘*how*’ to conduct the research, ‘*what*’ to do, and ‘*when*’ to do it. These may also be used as frameworks that may be used as templates to help prepare your dissertation proposal, design your research and lay out the chapters and contents of your dissertation. You should also gain a better understanding of the research process and your research activities will be more organised, efficient and focused.

3.1 The dissertation as a project

The Association of Project Management defines a project as “a *unique, transient endeavour undertaken to achieve a desired outcome.*” Projects and dissertation research share common characteristics. They have a defined beginning and end, they last for a finite amount of time, they consume resources like time and effort, there are a variety of stakeholders, and they produce specific deliverables.

Dissertation research can take advantage of many project management tools and techniques:

- Analogies like building a house can be used to explain the process of preparing a dissertation.
- Project managers know the benefits of proper planning. Among the many reasons, well thought-out dissertation research will experience fewer surprises, less rework and changes, better time allocation, effort better aligned to the assessment criteria, fewer delays and distractions, a better quality dissertation and submission on time.
- Various project lifecycles can be applied to the research process. Even simple models such as *initiate-design-develop-implement* will guide you in planning what activities to perform at each stage of the project.
- Breaking a problem down is a vital step in comprehension and analysis. A work-breakdown-structure (WBS) is essential to managing projects and extremely useful in planning, designing and controlling your dissertation.
- Project management tools and techniques can be useful. Planning tools like a Gantt chart will be a valuable addition to your dissertation proposal, and will help you keep track of progress and submit on time (an example is provided in Figure 4). Time management techniques and a to-do list will improve your personal efficiency and reduce procrastination and panic. Tools like brainstorming, mind-maps and fishbone (or Ishikawa) diagrams will help with problem solving and information overload.

3.2 The dissertation as a process

The shortest possible route to completing a dissertation may seem to be writing it from cover to cover. A dissertation is not a diary and its chapter structure is not the same as the steps involved in completing it. Preparing a dissertation is a process, which may be defined as a series of actions, functions and decisions that convert inputs like knowledge into a variety of tangible and intangible academic outputs.

Why is a process view useful? There are strong advantages to doing things one-step at a time. A process offers tutors a natural framework on which to hang topics, concepts, relevant knowledge and useful experience. It provides supervisors with a guide for their students and a ready checklist to gauge progress. A documented process relieves students of having to comprehend a huge amount of material on the subject of 'research' before starting work on their dissertation. It also helps students start earlier and faster, encourages more positive attitudes toward the subject and the project, results in less confusion and provides greater clarity about what needs to be done and when, helps students make more efficient use of their time, and ultimately leads to better learning and project outcomes.

Some tutors, supervisors and authors impose a strict process on their students. These are often similar to the broad steps described by Collis and Hussey (2009, p.10):

- Choose a topic
- Search and review the literature.
- Define the research problem
- Develop the research questions.
- Design the research
- Write the proposal.
- Collect the research data.
- Analyse and interpret the research data.
- Write the dissertation.

Preparing a dissertation is a far more complex endeavour however. There will be a lot of inputs, many sub-processes and a host of choices and decisions to be made. Figure 1 illustrates what is involved. Students should not be alarmed or deterred as this guide has been designed to lead you through the necessary steps by following the fifty tasks.

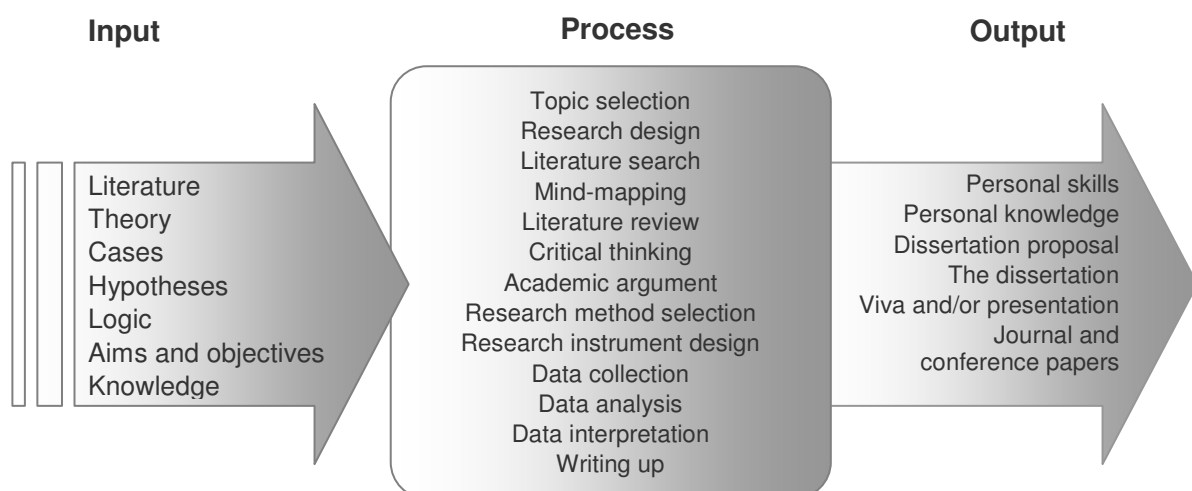


Figure 1. The dissertation research process

Offering a series of fifty steps does not imply there won't be challenges. Agnew and Pyke (1969) described research by means of a humorous but quite relevant diagram called the Island of Research. Although this may be more typical of Doctoral research than undergraduate dissertations, most students who have completed their dissertations will recognise more than a few of their landmark features. The serendipity mine, the bog of lost documents, a canyon of despair and peaks of confusion fill the landscape. Most prominent on their island is the amount of wandering about that is involved. Although there will be some surprises along the way on any research project, careful planning and a methodical approach will help avoid most of the setbacks.

3.3 The standard conversation

The process of research is not the same as writing about it. One useful way to look at a dissertation is as a conversation between the student and their examiners.

A dissertation is a coherent and reasoned argument about a problem. This can be treated as a discussion that structures the dissertation as well as the process of writing it up. A reliable and often-used model of the discussion is called the “*standard conversation*”, a hypothetical dialogue between an examiner asking questions and the student answering them. Versions of the standard conversation are described by O’Leary (2005, p39-60), McNiff and Whitehead (2006) and Yin (2003). O’Leary’s version (2004, p208) is noteworthy in its usefulness, and this has been amended slightly in Table 4 below to include some housekeeping.

The questions	Answers that structure chapters or sections
Tell me what your research is about?	Title Abstract Introduction Research question/s Hypothesis or position (as appropriate)
And why did you choose this particular topic/question?	Introduction Rationale
What do you hope to achieve?	Introduction Aims and objectives
I really don't know much about this; can you fill me in?	Background/literature review Recent and prior research (literature review) Theory (current and seminal) Context (social, cultural, historic and other)
How exactly did you go about doing your research?	Research design/approach Methodological approach Methods Limitations
And what did you find out?	Findings/results/emergent story Text, tables, graphs, themes, quotes Discussion, analysis, interpretation, meaning
How would you explain the relevance/importance of what you've done?	Conclusion Implications Significance Recommendations (especially applied research)
What literature informed you?	References and citations

Table 4. Amended O’Leary’s standard conversation

The standard conversation has other uses. It helps group related discussion into separate chapters, indicates what the chapters and their contents should be, and provides another way

for students to measure the quality of their dissertation as they write it by asking “Am I answering the question?”

Task 2. Schedule your work

It is time to prepare a rough schedule. Use a spreadsheet, a Gantt chart or even a piece of paper to draw the project timeline.



Start date is today (yes, start now!) and the completion date is the submission deadline. Use the standard conversation to identify primary tasks and chapters. Consider how much time to allocate to each chapter based on the assessment breakdown and marking schema. This schedule will be finalised in Chapter 4.

3.4 The dissertation as a series of chapters

Students find a chapter structure, or list of chapters and their order, to be useful as a template. Unfortunately this leads to a ‘paint-by-numbers’ approach and students can lose an important opportunity to be creative or tailor their document to suit their subject or research method. Assuming your examiners give you the freedom to do so, any chapter structure should therefore be looked upon as a *suggestion* rather than as a rule or shortcut.

Chapter structure does tend to be dictated by convention and the principles that underpin the standard conversation, and opportunities for creativity will tend to lie in the chapter title. Even then, some examiners will expect generic headings. Ultimately the chapter structure and chapter titles become a balance between readability, familiarity and creativity. To keep things simple, it is recommended that Masters students choose alternative formats but Bachelors students are limited to the standard conversation unless they can provide a compelling reason not to do so.

TITLE PAGE
ABSTRACT
ACKNOWLEDGEMENTS
TABLE OF CONTENTS
CHAPTER 1: INTRODUCTION AND OVERVIEW
CHAPTER 2: THE RESEARCH PROBLEM
CHAPTER 3: LITERATURE REVIEW
CHAPTER 4: RESEARCH DESIGN
CHAPTER 5: ANALYSIS AND FINDINGS
CHAPTER 6: SUMMARY AND CONCLUSIONS
CHAPTER 7: REFERENCES
CHAPTER 8: APPENDICES

Universities retain copies of all dissertations, and these provide an invaluable source of information about what is expected of a dissertation, typical topics, typical research methods, chapter structures, titles and so on. Dissertations are stored either in the university library or in faculty libraries, and some academics keep copies on their own bookshelves. Be aware though, you may not be actively encouraged to refer to these old dissertations because they can be plagiarised, can be used to dodge large aspects of work like the literature review, and can limit a student’s creativity. If you choose to use these works, be advised to use them properly as there is a good chance that one of your examiners will have supervised or examined any particular one!

3.4.1 Discourse structure

A review of the assessment criteria in Chapter 2 shows a high proportion of marks are awarded to argument and structure. Examiners appreciate dissertations that stay focused on their aims, objectives, key theories and hypotheses and research questions. Examiners take a hard line when presented with disjointed, rambling discussion, particularly when marking late at night or trying to cope with tight deadlines.

Each chapter needs to discuss the key elements in a way that is easy to find, logical, flows or reads well, and leaves the impression of competence, analytical thinking, rigour and planning. An efficient mechanism for structuring this discourse is to use “swim-lanes”; a construct used in process modelling to group activities throughout the duration of the process (referred to as longitudinal modelling) according to particular criteria. Students can use swim-lanes to ensure the clarity, coherence and completeness of their discussion, and use them to prevent waffle and extra, irrelevant concepts creeping in. Examiners use them consciously or unconsciously to ensure the student has been thorough in their treatment of the issues.

What does a swim-lane look like? The dissertation chapters become the lengths of the swim (or process). Each concept such as an aim, objective, theory or problem takes up its own swim-lane and should be covered in each chapter. Figure 2 below illustrates. Discussion will be kept in its relevant swim-lane, and each chapter may even be structured using section headings with consistent terminology to signpost that lane. The same order would then be retained throughout the dissertation.

This model may also be used as a checklist. “*Have I addressed the project objectives in the literature review, in the methodology, in findings and in conclusions?*” The review order may also be reversed. “*Are my conclusions consistent with my aims, key theories and hypotheses?*” And the review may also be used to manage knowledge and the argument. Ask yourself “*Is this concept relevant to my aims and hypotheses?*” Rather than being constrictive, experience suggests that this compels students to keep track and deliver relevant and complete discussion.

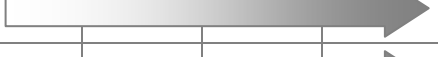
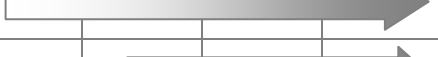
	Introduction	Literature review	Methodology	Findings	Conclusions
Topic					
Project aim/s					
Project objective 1					
Project objective 2 etc.					
Key theory 1					
Key theory 2 etc					
Research problem					
Research question / hypothesis 1					
Research question / hypothesis 2 etc.					

Figure 2: Discourse structured into swim-lanes

3.5 Argument structure

The word ‘argument’ has an important place in dissertation research. At its most simple it may be regarded as “*expressing a claim or point of view on a subject that is supported with evidence*”. Dissertations involve complexity and formality. A dissertation argument may therefore be defined as a series of rational statements that lead to an appropriate and defensible conclusion, with each statement being supported by appropriate evidence and each statement being linked to the other with inferences that are supported by logic.

Your dissertation is in itself an argument. It aims to investigate a topic by putting forward a number of statements that are derived from literature, observation, hypothesis, logic and other statements. Each statement will be supported with evidence, such as an observation or cited literature. A suitable conclusion will be arrived at that is supported by all the statements and the evidence presented.

Figure 3 illustrates an argument that was presented in an actual dissertation. The research hypothesis was that stress is a problem for project managers. The student searched the literature and found some support for this hypothesis. Further review found more literature that described related factors like causes and effects that indirectly confirmed the hypothesis. The student then used logic to construct a model from literature that linked stress to burnout. Research questions were derived and the model was put to a sample of project managers. The majority of the sample agreed with the hypothesis, and the student was able to conclude that this model described one of the factors that cause stress in project managers. The student did not make the mistake of making claims that were not supported by the literature, the research questions and the data.

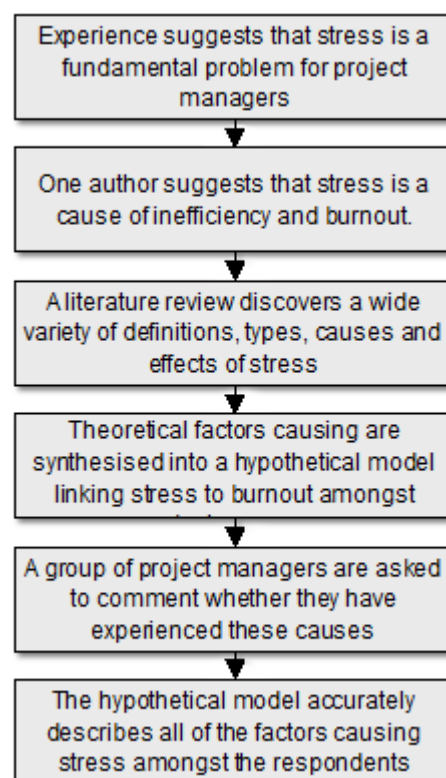


Figure 3. An example of a dissertation argument

Mapping the dissertation argument is a powerful way of keeping a discussion relevant, focused and most importantly valid. Mapping begins with choosing and reading up on the topic and is taken all the way through to the conclusion, as shown in Figure 3. The argument map may be

used to identify gaps in the evidence, eliminate irrelevant discussion and a summary of the argument may even be used to form the abstract.

Arguments are discussed in more detail in section 4.9.

Task 3. Prepare your dissertation document



Writing is made so much easier if you are working to a template. Preparing a master document and configuring it to the university requirements will keep your writing in one place, make sure the work is presentable from a very early stage, make the supervisor's job easier when they review it, and assist you by encouraging methodical thinking.

It is assumed that your dissertation will be written on a wordprocessor because no-one should be using a typewriter anymore.

- Create a folder / subdirectory on your computer to hold all the dissertation work plus data and files that are collected and created.
- A folder will make your work easier to back up.
- Don't store a dissertation on a memory stick – they are easily lost or corrupted.
- Create a new document in that folder. If the university provides a template, copy that into the folder and rename it.
- Create a title page using the university format.
- Add a contents page with a title 'Contents' at the top. Don't build the contents yet.
- Add a page for each of the major chapters, and add chapter headings for each.
- Use the wordprocessor software to automatically build the contents page from the headings style.
- Add page numbers as per the university format.

i Useful tip: Learn your wordprocessor's automation features. Instead of pressing ENTER several times to move to the next line, insert a PAGE BREAK. Don't manually create headings and try to build a contents page. Use heading STYLES for each chapter heading. Use style based chapter and section NUMBERING limited to three levels (i.e. chapter 1, section 1.2, section 1.2.3). Then automatically build a contents page using those heading styles. Automation will take 5 minutes to learn, and will save hours of work later when reformatting.

3.6 In summation

This chapter has described the dissertation as a project, a process, a conversation, a series of chapters and an argument. Understanding these formats is vital to efficient completion. On finishing this chapter you should also have scheduled the work, configured the dissertation document, and know a little more about logic and argument.

3.7 Recommended reading

This chapter refers to and recommends the following literature:

APM (2012) Association of Project Management, www.apm.org.uk

Collis, J. and Hussey, R. (2009) *Business Research*, Palgrave Macmillan

Cottrell, S. (2005) *Critical Thinking Skills*, Palgrave Study Skills

Facione, P.A. and Facione, N.C. (2007) *Thinking and Reasoning in Human Decision Making: The Method of Argument and Heuristic Analysis*, The California Academic Press, Millbrae, CA

Fisher, A. (2001) *Critical Thinking: An introduction*, Cambridge University Press

Murray, R. (2005) *Writing for Academic Journals*, Open University Press, Maidenhead, England

O'Leary, Z. (2005) *Researching Real-World Problems*, Sage, London

Onions, P.E.W. (2009) "Thinking Critically: An introduction", working paper, available online at <http://www.patrickonions.org/docs/academic/2009%20Thinking%20critically.pdf>

4 Preparation

A little knowledge and a couple of skills are needed before work can begin on the project. This chapter will explain the project organisation, review the project deliverables, finalising the schedule and briefly touch on a few important skills.

i Useful tip: At this stage you should be clear about the overall purpose, process and structure of a dissertation, as well as an understanding of research quality. You should also have prepared a set of goals, a rough schedule, and a template dissertation document. If these tasks have not been completed then now is a good time to do so.

4.1 Understand the project organisation

Dissertations are self-directed study projects, meaning the student is responsible for the planning, execution and delivery of the project. The lack of direction can be unsettling for students who are used to being told what to do and when. Help is available with the aid of those involved in the project. Dissertations involve various stakeholders who play several roles.

4.1.1 The module tutor

A research module tutor provides students with instruction in the subject of research and recommends further resources like textbooks. Students are typically required to submit a dissertation proposal to complete the module, so tutors will also be available to support students with queries about research and how to choose and investigate their particular topic.

4.1.2 Examiners

A dissertation is marked by an examiner and second marked by a moderator or second examiner. The examiner will use academic judgement and a defined set of criteria to evaluate the dissertation and award a mark and/or further action.

4.1.3 The supervisor

A supervisor is a mentor, guide, educator, sounding board and motivator. The supervisor does not mark a dissertation and there is no formula for supervision. Students may have little to no choice in their supervisor and are typically assigned a supervisor on the basis of workload, subject knowledge, supervision experience and personal attributes.

Any one supervisor may have only a couple of students, or be supporting several dozen. Supervisors may have time to engage with students, or they may be bogged down in a busy schedule of teaching, marking, research, publication, administration and generating income for the university. Your supervisor may be an expert in the subject or topic, or they may only have a basic working knowledge. They will generally have a good knowledge of research and the various research methods students typically choose, and they may have examined (marked) dozens or even hundreds of dissertations.

Each faculty and university will have unique dissertation and supervision requirements, and supervisors are invariably individuals who will see their role, responsibilities and approach differently. Some may be autocratic and expect their students to do exactly what they are told. Others may be nurturing and provide a lot of reassurance and support whilst the student learns and evolves. Unfortunately some may even be too busy or distracted to spend much time with their students. For these reasons it is important that students quickly get to know the expectations of their supervisor and clarify each other's roles.

What is a supervisor typically responsible for?

- Assessing research risks and research ethics.
- Offering guidance but not necessarily instruction on aspects of the project, including:
 - The selection of a topic.
 - The standard of work and language expected.
 - Planning and scheduling the work.
 - The structure of the dissertation.
 - The methods and techniques involved.
 - Where the student can find instruction or technical support if needed.
- To meet with the student to review progress and offer guidance.
- To assist with arrangements for study leave or absences.
- To read through and make general comments on the dissertation at least once.
- To encourage students to engage with their subject and to complete the dissertation.

A couple of things to remember:

- A supervisor will be quite busy and not able to meet on demand. Don't leave things to the last moment; make an appointment ahead of time.
- A supervisor will not be able or willing to proofread your work. They will typically scan anything you send them before every meeting, identify a couple of points of concern, and focus on those.
- Meet with your supervisor as soon as possible, establish expectations and start building a good working relationship.
- Supervisors are not impressed if you come to meetings unprepared, ignore suggested changes, arrive late or are aggressive in your demeanour. Be respectful and diligent.

The following advice was kindly supplied by Mark Laurillard, senior lecturer at the Center for Project Management.

Support

The role of your supervisor is to provide you with a support framework. He or she will advise on the practicalities of your research and may be able to suggest people or groups to get in touch with as well as recommending reading material. As far as possible, your supervisor will be familiar with the particular area of study you are engaged in.

Once you have been given the name of your Dissertation Supervisor you must make an initial appointment to see him/her. The earlier you have your first meeting with your Supervisor, the better

You will need to see, and keep in contact with, your Dissertation Supervisor regularly throughout the final year. This will be your responsibility

Your meetings with the supervisor will be recorded on a formal supervision record, requiring each student to plan and report at specific milestones and requiring the supervisor to give interim feedback at each milestone. Appendix 2 provides a template record form.

The record will be opened at the first supervisory meeting. Students will transcribe their milestone schedule from their proposal onto the record, and agree on milestone dates with their supervisor. The supervision record will be kept by the supervisor, and maintained at each supervision meeting. All meetings will be recorded and the student's progress will be evaluated and noted with any recommendation and guidance from the supervisor.

Supervisors will evaluate the dissertation at the end of each milestone and award a RAG status (red-amber-green). Red status means rework, with no progression, Amber means proceed with

caution, and attention to feedback is mandatory. Green means proceed, and feedback is optional but recommended.

Students will not be able to submit their dissertation for final marking unless the record has been completed. Students who have not followed a realistic timeline (i.e. submitted a completed dissertation without regular supervision) may be rejected or will be subject to a viva panel to determine the authenticity of their work.

Criticism

Academically it is your supervisor's role to provide a critical analysis of your work as it develops. This means probing the strength and coherence of your arguments; questioning the validity of the evidence you provide; and scrutinising the logic and structure of your dissertation as it emerges. Your supervisor may also extend criticism to syntax and style. You must realise, however, that you will only be offered advice; you will not be told what to do.

Do not expect your supervisor to be your proof-reader! They will usually comment on an issue once as they encounter it, and then expect you to make the appropriate changes to the remainder of the dissertation.

Do not expect your supervisor to provide you with a printed copy of your dissertation. Many Universities now have printing budgets and supervisors will likely be unwilling to print your evolving work every time.

Supervision contact

You should meet with your supervisor regularly, preferably an individual meeting every three weeks or so.

Send each chapter to your supervisor as it is done, and ideally a few days before each meeting. Do not overload your supervisor. Send them the whole dissertation in the beginning so they can determine whether the structure is acceptable. Therefore only send the updated chapter/s. Feedback will be quicker, easier to correct, large problems can be remedied sooner and not magnified in later chapters.

It is recommended that both students and supervisors keep a record of supervision and progress, and students also keep a copy of notes provided by their supervisor. Appendix 2 includes a template supervision record.

4.1.4 The student

Students are responsible for practically every aspect of the project apart from assessment. If in doubt, you should assume that it is you who needs to deliver. Some responsibilities are worth mentioning:

- Familiarity with and adhering to rules, guidelines and assessment criteria.
- Choosing a suitable topic and agreeing this with your supervisor.
- Planning all aspects of the project.
- Preparing a schedule of work and deliverables, and agreeing on these with a supervisor.
- Making appointments with your supervisor.
- Preparing for meetings, attending on time, taking notes and agreeing on action points.
- Taking the advice of supervisors.
- Providing progress reports if required.
- Reviewing appropriate literature and preparing accurate bibliographic references.
- Developing sufficient knowledge of your topic's subject.
- Developing sufficient knowledge of the subject of research.
- Choosing an appropriate research methodology, method and instrument

- Appropriate and accurate sample selection, data collection, analysis and interpretation.
- Writing up, avoiding plagiarism and presenting the dissertation correctly.
- Proof-reading and making suggested corrections.
- Submission on time and according to relevant regulations.

Task 4. Make an appointment with your supervisor

Once you have completed this chapter you will be ready to meet with your supervisor for the first time. Get in touch, and remember to prepare a checklist of things to discuss.



4.2 Identify the project deliverables

The research module and dissertation research require the production of more than just the dissertation itself.

- Various administrative tasks.
- The research proposal.
- Completed and approved research ethics forms.
- The dissertation.
- A presentation and perhaps a viva.
- A conference-style paper.

Task 5. List the deliverables

Review the module information and make a list of the various project deliverables.

This list should be discussed with your module tutor over the course of the research module, and again in your first meeting with your supervisor.



4.3 Finalise the project schedule

The next step in planning the dissertation is to complete a schedule set out in Task 2. Schedules are simply a list of tasks with a duration, a start date and an end date. They can be planned on a piece of paper, as a list, or using software like spreadsheets or project planners.

Begin with the outline schedule from Task 2. Add the various deliverables to the schedule. Identify the respective deadlines for each deliverable, and assign these to the end date of each of the deliverables on the schedule. Use the dissertation process in section 3.2 to identify the activities needed to produce each of the deliverables, and add these to the schedule.

At this stage it is impossible to give more than a rough estimate as to how long each activity will take. Use the assessment criteria as a guide and approximate how much time should be allocated to each of the tasks. Do not worry about being too accurate as the estimate will change as the process and activities become clearer. It is also recommended that more weight

be given to the time consuming activities. Experience suggests the following activities tend to take far longer than anticipated:

- Reading about research.
- Designing the research.
- Reviewing the literature.
- Collecting data.
- Analysing data.
- Writing up.

On the other hand, too much time tends to be spent on choosing a topic, reviewing irrelevant literature and designing the document - particularly the cover page. It is also recommended that a week be devoted to the end of the project for reviewing the dissertation before submission. In most cases this time will be lost to overruns, but adhering to the schedule and using the last week to improve overall dissertation quality can often win an extra 5-10%.

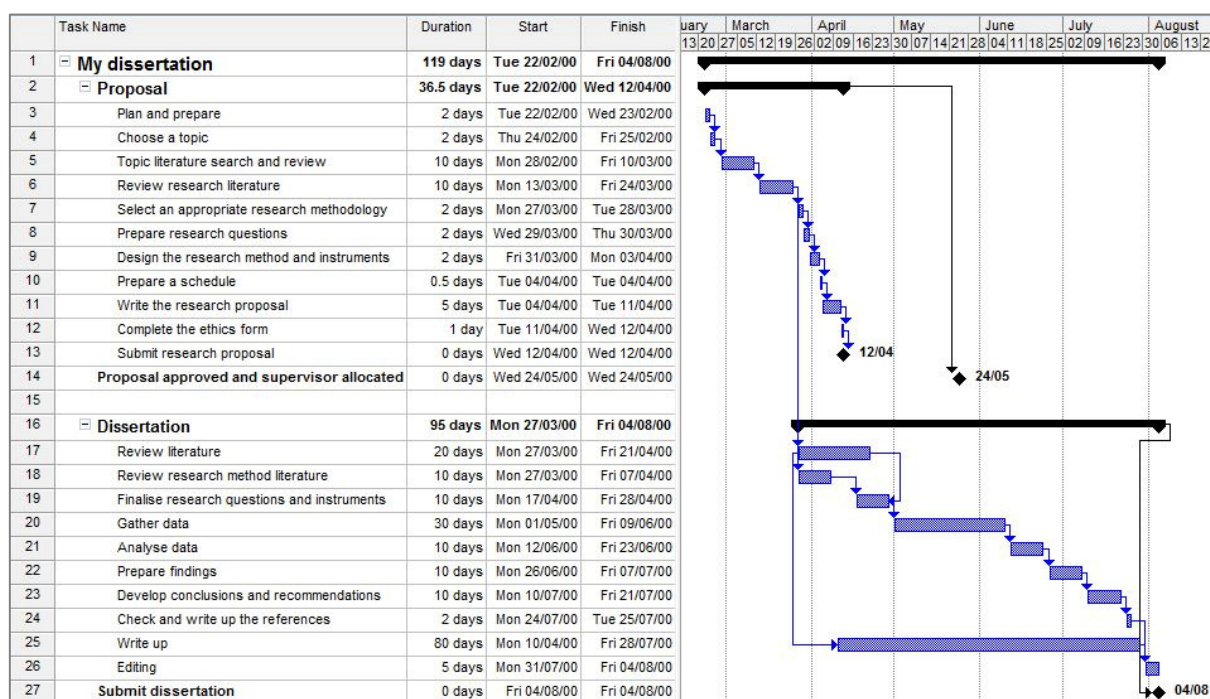


Figure 4: A sample dissertation schedule

Now, plot the deliverables and activities. A Gantt or bar chart is the best. Project scheduling software produce neat charts such as that illustrated in Figure 4, but a hand drawn chart can be just as effective. This chart should then be placed in a convenient visible location where it can be reviewed at least once a week. This will keep you focused and prevent any activity from taking on a life of its own.

Task 6. Finalise the schedule

Follow the instructions in this section and review the schedule. Does it seem plausible? Review it with your module tutor and supervisor. If the schedule is not viable it may not be used in your dissertation proposal.



4.4 Get to know the library

Whilst it is possible to complete a dissertation without a visit to an academic library of some sort, that dissertation will not receive a good grade. Knowledge of the latest theory is important, and an examiner can usually tell within the first couple of pages of the literature review whether the library has been used effectively!

Modern university libraries offer two main resources; the traditional physical repository of books and journals, and electronic repositories that offer search facilities, databases of information and even electronic copies of material. Libraries also offer instructional material such as training, guides on referencing and literature, and tutorials on learning and writing. One example is Leeds Metropolitan University's Skills for Learning website, where topics from referencing and reading to research and reflection are provided.

Students are advised to acquaint themselves with accessing the traditional and electronic libraries. If this is still an outstanding item on your 'to-do' list then walk over to the library and speak to the friendly folk who have the job title of librarian. They will help you ensure your library card is up to date and access has been granted to the electronic areas of the library.

Whilst there, it is good practice to ask the librarian for some assistance on your dissertation. They have had years of experience helping students find the right material, and may even have assisted students with dissertations on the same topic.

Books offer a useful and comprehensive start, but it is not sufficient at either Bachelors or Masters levels to rely on books alone. Books take time to write and publish, so their knowledge can be out of date. Students are expected to cite journals and conference papers. Whilst at the library, ask the staff if they keep physical copies of any journals relevant to the field of study. For example, the library may retain copies of the *International Journal of Project Management*, an indispensable resource for any students wishing to research that field.

Journals and conference publications may also be made available in electronic format through the library or through its subscription service. A library card may grant access to these sources, and students should acquaint themselves with using the search engines provided. Librarians again can provide assistance in using this resource.

4.5 Get to know Internet resources

The Internet has exposed an enormous amount of knowledge and enabled a great number of people to publish their opinions on every conceivable subject. The Internet is a gateway to a large number of authoritative and expert repositories, but it is also a dumping ground for a lot of unsupported views. Module tutors and library tutorials will help explain how to identify valid evidence and acceptable Internet sources.

4.5.1 Useful websites

Students are advised to locate and bookmark websites that are relevant to their research and host authoritative material. Some examples include:

- The Athens portal to academic databases - <http://www.athens.ac.uk/>
- Emerald research publishers - <http://www.emeraldinsight.com/>
- Elsevier health and science - http://www.elsevier.com/wps/find/homepage.cws_home
- William Trochim's Social Research Methods - <http://www.socialresearchmethods.net/>
- The Stanford Encyclopaedia of Philosophy - <http://plato.stanford.edu/>
- Trade, industry and association sources.

- Online journals, such as;
 - The International Journal of Project Management - http://www.elsevier.com/wps/find/journaldescription.cws_home/30435/description
 - The Electronic Journal of Knowledge Management - <http://www.ejkm.com>
 - Practical Research, Assessment and Evaluation - <http://www.pareonline.net/>
 - Forum: Qualitative Social Research - <http://www.qualitative-research.net/index.php/fqs>

4.5.2 Using search engines

A search engine is an invaluable tool in answering just about any research question. There are many online tutorials that will help you learn how to use them, so this section will cover some key steps you need to consider.

Choose a **search engine**. Google (www.google.com) is the major player but a search will deliver websites from wikis, commercial, marketing, blog, forum, email, personal sites, academic, government and other sources. A search of the phrase “*role of the project manager*” in quotes produces 6.9 million hits, most of which are irrelevant. The same query on Google Scholar (<http://scholar.google.co.uk>) produces a more manageable 1500 hits from sources like the International Journal of Project Management.

Translate the topic into search terms.

- Start with copying the title exactly and not using quotes. The search engine will look for all documents in which those words appear, not necessarily in that order. Then use quotes on either side of the phrase. Now the search engine will look for documents that contain the exact words in the same order.
- Look for synonyms. In the example used above, substitute the word *function* for the word *role*.
- Rephrase the phrase. In this example change “*role of the project manager*” to “*project manager role*” or even “*project management role*”.
- Add words to refine your search. If you think that gender may have an effect on the roles that project managers play then alter the search query to “*role of the project manager*” + *gender*. This will produce 122 hits in Google Scholar and from these you can write a paragraph or two on how gender impacts the subject and even derive a research question to add to your overall study of the general topic.
- Look for similar concepts to substitute for one of the elements in the topic. For example you could replace ‘*role*’ with words like *leadership*, *behaviour*, *skills* and *duties*. These will all discover new perspectives on the topic.

Review the results on the first 3 or 4 pages of hits. Are you getting the material you were hoping for? Is the search taking you in a particular direction? If there is anything useful here then start building a mind-map or list of the key authors, concepts, debates and theories you have found.

Use the literature you are uncovering in your broad search to focus. Look for more articles by the same author. What terminology is being used by authors to describe your topic? What literature do they refer to? What journal or publication are they writing for and are there more articles in there you could use?

Finally, think about your topic. Project management will be discussed in project management journals, but there are other sources of information about what project managers do. Online job descriptions are a good source of information.

 **Useful tip:** Do a search now on ‘search engine tutorial’ and learn a bit more on how to get the most out of these tools.

4.6 Learn how to read efficiently

Any dissertation topic may involve scanning thousands of journal articles and books, and reading maybe a hundred or so. The process of reading efficiently is vital to completing a dissertation on time and to the right quality.

Start by reading the right material. Read up to date journals and authoritative books, stay on topic, and don't get distracted by everything that appears remotely connected or vaguely interesting. This may sound obvious, but more than half of the literature reviews I have encountered displayed insufficient depth and discussion that had little to do with the topic.

The next suggestion is to cultivate your own method of gathering and building your understanding whilst reading. Mind-mapping, discussed below, is a powerful method of building an overall visual picture of the subject. Another technique is to write a single paragraph on each key literature source you find, critically reviewing what they have to say about the topic and comparing their views to other authors. These individual paragraphs may then be collated to form the literature review.

The third suggestion is to keep track of sources. Always record citations whilst reading, note or map the concepts and websites you encounter, and immediately record full bibliographic references. It is inevitable that these references will be lost if not recorded, and this usually costs days to remedy at the very moment when you are rushed trying to submit the dissertation.

Further discussion on the subject of 'reading' is provided in Chapter 6 along with practical examples.

4.7 Mind-mapping

Mind-mapping is a useful technique for building an overall understanding of a subject or research question, and is arguably the fastest means of modelling a subject whilst reviewing literature.

It is recommended that students review library tutorials or dedicated texts for an introduction to this technique, such as Buzan and Buzan (2006). A mind-mapping methodology that has proved useful to students comprises the following steps:

- Place the topic at the center of the map.
- Read the literature.
- Add new concepts to the map as you encounter them as branches.
- Record citations of the sources near the concepts as they are added.
- Record the references to these citations in your dissertation document.
- Organise, group and order the branches into logical categories.
- Review all branches and sub-branches:
 - Label appropriately.
 - Prune irrelevant branches.
 - Use colour to distinguish between one category and another.
- Start to use the mind-map effectively:
 - Print in large format and pin it up in your work area.
 - Use the branch labels as headings for the literature review and findings chapters.
 - Produce research questions that investigate each branch/category.
 - Check areas off as you complete them in your literature review.

Figure 5 below shows a simple mind-map. This was created using the free software package FreeMind, but there are other alternatives like MindJet's MindManager and even creating diagrams using Microsoft Excel's drawing tools. Further discussion and examples will be presented in Chapter 6 (Read about the topic) and Chapter 11 (Review the literature).

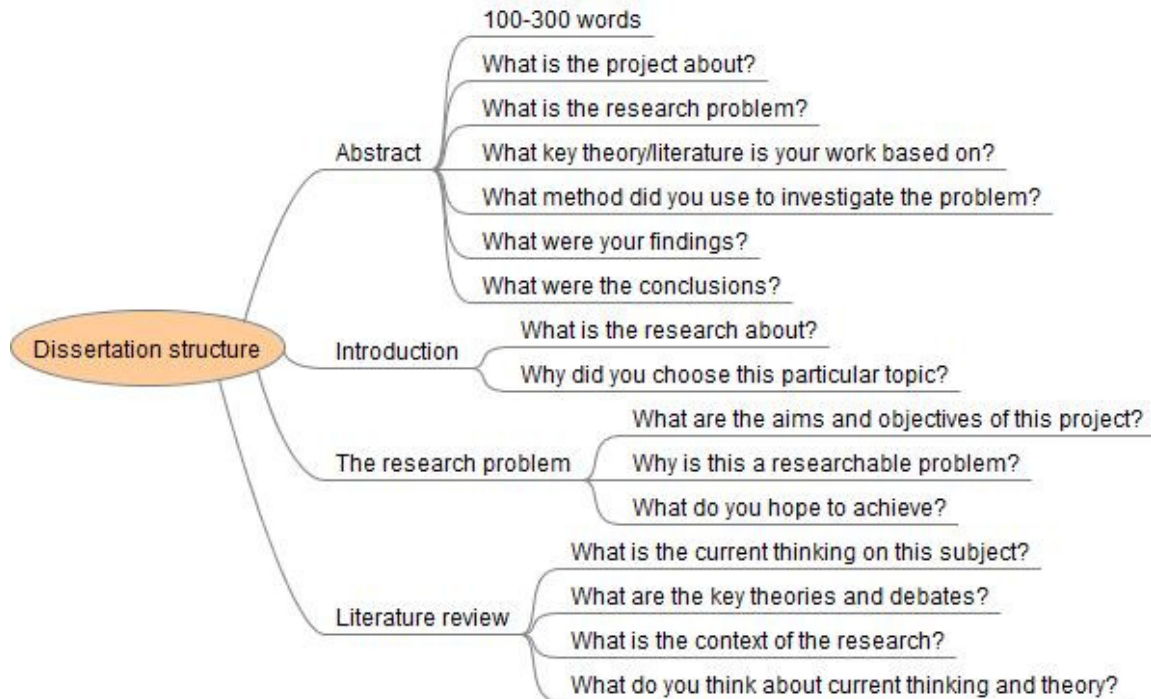


Figure 5. Mind-map example

4.8 Learn how to write in an academic fashion

According to Murray (2005) in her useful and insightful book *'Writing for Academic Journals'*, writing skills are not automatically conferred on the author by schooling or careers. Academic authors have to grapple with challenging subject matter and exacting logic; all whilst contending with the field's rhetoric, accepted language and writing style, required format, critical thinking and the need to cite and reference correctly. Academic writing is more art than science.

Art however has its limitations. Most academic authors' primary objective is to write about their subject, not demonstrate writing prowess. Discovering efficient writing skills takes time, so practical methods are needed for preparing the dissertation. The writer needs to identify the standards and expectations of their audience, since failure to meet expectations will far outweigh the value of arguments and ideas contained within. Writers then consider these expectations whilst writing, and evaluate the dissertation in terms of them before submission. The following 'measures' are typical of an examiner's 'soft' expectations:

- Clarity and simplicity.
- Complete.
- Critical.
- Current.
- Readable.
- Soundness of argument.
- Relevance.
- Structure.
- Substance.

Academic writing may be viewed as a process of convincingly communicating an argument and its substantiation to an audience. Metcalfe (2003) sees the argument as a fundamental format for research. This paper will treat the argument as the basic yardstick for measuring the quality of the contents of a paper. In terms of how to write, the technical advice offered by Gopen and Swan (1990) comes highly recommended. These authors describe communication as the “*fundamental purpose of scientific discourse*” and focus on the constructs of the written document, particularly on sentences and paragraphs.

In terms of further reading, research textbooks frequently provide useful writing tips and it is worth reviewing these sources and making a checklist of issues to remember whilst writing up. Bryman and Bell (2003, pp.559-565) offer one such checklist. More extensive literature is available, such as Crème and Lea (1996) and Fairburn and Winch (1996).

4.9 Critical thinking

Critical thinking is an essential skill for students, academics and those whose thinking forms an important aspect of their jobs. It is a way of seeing things and a descriptive term for the set of methods used to consider problems. Critical thinking leads to an informed, aware, systemic, considered and logical approach to deciding what to believe or do; with arguments and conclusions that are more likely to be valid, substantiated, resistant to criticism and representative of the situation.

4.9.1 Introduction

It is easy to fall into the habit of thinking and writing uncritically. Analysis can be tedious, Internet search engines allow us to dredge up copious quantities of literature to ‘support’ an opinion, and the contentious nature of ‘proof’ can make argumentation difficult and socially problematic.

As a mindset, critical thinking has broad and important application in academic and non-academic life. For the student, critical thinking is a set of skills that must be applied to a range of academic activities; including reading, research, analysis, argumentation and writing. Better understanding of critical thinking will improve assignments and dissertations, and compels students to diligently review literature and analyse data. For the practitioner, critical thinking underpins evidence-based decisions, encourages rational thought, and supports the decision maker against hype and emotive argument.

A concise introduction and useful bibliography for critical thinking is offered in Cottrell (2005). Facione and Facione (2007) examine the subject in even further detail, and Northedge (2005) discuss a range of related skills. Students are advised to read any of these works or consult with their bibliography before proceeding with their literature review.

4.9.2 Definitions of critical thinking

Critical thinking is a complex and tacit activity, and may be regarded as an art form. This nature is reflected in the broad range of its definitions, with some disagreement as to what it is all about (Johnson, 1992).

Beyer (1987) defines critical thinking as a process of determining the authenticity, accuracy and worthiness of information or knowledge claims. Scriven and Paul (1996) see critical analysis as the “*reasoned and logical process of skilfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information.*”

Browne and Keeley (2001) define critical thinking as an awareness of a set of interrelated critical questions, the ability to ask and answer critical questions at appropriate times, and a desire to actively use the critical questions. Some quotations may also be found in Fisher (2001):

Critical thinking is reasonable, reflective thinking that is focused on deciding what to believe or do. (Norris and Ennis, 1989)

Critical thinking is that mode of thinking - about any subject, content or problem - in which the thinker improves the quality of his or her thinking by skilfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them. (Paul, Fisher and Nosich, 1993)

Identifying what a subject is not is also a potentially useful exercise. One common misconception encountered whilst explaining critical thinking is that it is a negative, judgemental or fault-finding process. On the contrary, critical thinking is a positive and impartial approach to considering problems and situations. Critical thinking is not about 'academic pondering'; it is a transferable skill useful in most situations where instinct or 'gut feel' is unsatisfactory.

Common themes emerge from the above definitions. Some see critical thinking as a process, whilst others see it as an approach. Characteristics such as questioning, quality, veracity of arguments and claims and structuring recur. The following definition may be synthesised from these perspectives:

Critical thinking is a way of thinking, and a set of skills, that encourages an informed, aware, systemic, considered and logical approach to deciding what to believe or do. Critical thinking leads to arguments and conclusions that are valid, substantiated and resistant to criticism.

These definitions describe critical thinking as a mindset, or way of thinking, and as skills that may be applied in a methodical fashion to examining and discussing a problem.

4.9.3 Critical thinking as a mindset

Writers cannot jump directly into critical thinking as if following a recipe. Critical thinking begins with a state of mind that may be described as capabilities:

- Learning to think from any perspective.
- Readiness to explore new ideas or conclusions.
- Becoming open to and willing to engage with different viewpoints.
- Relating personally held points of view to the argument.
- Building supportable interpretations.
- Recognising how any discourse reflects its author's argument and perspective.

There is evidence of cultural differences in critical thinking, and international students in particular should identify what their tutors expect of critical thinking (Kutieleh and Egege, 2004).

4.9.4 Critical thinking as a process

A methodical process is inherently easier to explain and learn than abstract concepts. Some authors have treated the subject from the process perspective. Meyers (in Varaki, 2006) separated critical thinking into problem-solving and decision-making processes, with 8 steps:

Problem Solving

1. Recognise and define the problem to be solved.
2. Identify the problem's root causes.
3. Identify criteria for evaluating solutions.
4. Identify possible solutions.
5. Evaluate possible solutions against criteria.
6. Select "best" solutions.
7. Develop a detailed implementation plan.
8. Evaluate the effectiveness of the solution.

Decision-Making

1. Identify and define the goal to be achieved.
2. Analyze the opportunity/relevant issues.
3. Identify criteria to assess strategies and actions.
4. Identify possible strategies and actions.
5. Evaluate possible strategies and actions.
6. Select “best” set of strategies and actions.
7. Develop a detailed implementation plan.
8. Evaluate effectiveness and opportunities.

Meyer’s two processes are quite broad and therefore may be applied to many situations. They are however too generic to be applied to academic writing without adaptation and further defining. This paper will therefore seek to illustrate critical thinking through the process of writing an academic paper.

4.9.5 Analytical stances

There are a variety of analytical stances that the critical thinker can adopt:

- **Reflective** - a deeply considered evaluation of a discourse and the context of its production (Clark, 2008).
- **Reflexive** - a consideration of the impact of the writer or one’s own position on the discourse and how they interpret their situation.
- **Questioning** - a structured investigation into the issues at hand. The seven interrogatives of *what*, *where*, *when*, *which*, *who*, *why* and *how* may be used; as may Paul’s Socratic questions (1990):
 - Questions of clarification.
 - Questions that probe assumptions.
 - Questions probing reasons and evidence.
 - Questions about viewpoints.
 - Questions probing implications.
 - Questions about the question.
- **Dialogic** - the collaborative construction of viewpoints or knowledge.
- **Comparative** - examining the similarities, differences and consequent implications of writers’ positions in discussing a topic.

4.9.6 Critical thinking strategies

A writer may adopt three critical thinking strategies; non-critical, weakly critical and strongly critical:

- **Non-critical thinking** identifies, regurgitates and describes a set of ‘facts’ without relating them to each other or to a broader context or topic. An example illustrates:

Dove (1999) says that knowledge management has huge potential. Malhotra (2005) says knowledge management has failed to deliver on its promises.

Here the reader is presented with the ‘facts’, that two authors each made statements about a subject. The reader is left to link them or draw conclusions, and cannot easily ascertain the writer’s opinion or position.

- **Weakly critical thinking** involves analysing situations, considering different viewpoints, and developing own conclusions. For example:

Whilst Dove (1999) says that knowledge management has huge potential, later authors such as Malhotra (2005) have refuted these claims by saying that few projects have delivered their intended benefits. One consequence would be waning commercial interest, which personal experience confirms to be the case.

Here the two positions are presented, linked, conclusions drawn and the writer's position (and claim) is clearly stated. Weakly critical thinking roughly equates with critical analysis, discussed below.

- **Strongly critical thinking** involves treating claims as human constructs that are complex, value laden and subject to challenge. Underlying assumptions, paradigms and logic require exploration. The reader would determine what meaning has been communicated through the writer's choice of language, medium, publication, authorities, evidence, position and arguments. In so doing the reader will understand why and how the author constructed their claims.

Dove's (1999) position that knowledge management has huge potential is strongly influenced and perhaps compromised by his commercial affiliations; evidenced by his position as consultant and the emotive selling and factually deficient style of language he uses. Time has proven this particular argument to be weak, with more recent and more credible authors such as Malhotra (2005) providing a rigorous and ultimately more plausible analysis of the reasons why such literature may be described as hype.

In this example the reasons for the original authors' positions and the values inherent in their arguments are explored. The reader's opinion and values are clearly evident, and the reader could go further and explore their own reaction to this literature and their own values and judgements. Strongly critical thinking is required for critical evaluation, discussed below.

4.9.7 What does critical analysis mean?

Your choice of strategy and argument may be influenced by a requirement to be critical, and exam question or assignment briefs may be prefixed with the instruction to 'critically analyse'. According to the University of Sussex website, critical analysis means "*considering the claims, what they are based on, and how far they seem to apply or be relevant to a given situation.*"

Critical analysis involves a thorough and ideally non-judgemental **investigation**, or weakly critical thinking. This involves identifying, scrutinising, describing, demarcating and testing the relevant subject. Analysis entails close inspection; by considering the subject or problem from various perspectives, breaking it down into its constituent components or premises, checking the accuracy of and evidence for each, and checking the logic or relationships that binds the argument or concept together. Use the seven interrogatives.

4.9.8 What does critical evaluation mean?

Critical evaluation equates to strongly critical thinking, weighing up a statement or question, along with its underpinning premises, assumptions and evidence. It involves considering the arguments for and against, using a set of evaluation criteria that are relevant and meaningful, and arriving at a conclusion as to the soundness of the statement, position, argument or question. Since critical evaluation is a **judgement**, claims may be assessed in terms of own experience - if that experience is relevant to the issue under discussion. Personal experience will ordinarily influence judgements made as well as selection of evidence. The disclosure and inclusion of these influences consequently helps establish the validity and credibility of critical arguments and claims subsequently made.

4.9.9 The argument

An excellent examination of the subject of arguments as well as more complex and less linear examples may be found in Facione and Facione (2007). Murray (2005, p93) also provides useful pointers on how to start constructing an argument.

Critical thinking is structured by and expressed through an argument. Presenting a well-constructed argument is an essential skill for students to acquire. No academic paper or text should be prepared without prior and due consideration to its argument.

In the loosest sense an argument can be defined as a series of statements that lead to a particular conclusion. An argument is not the more colloquial understanding; a quarrel or clash (although some academic arguments can become heated). Arguments can be explained simply as:

- An argument begins with a situation, problem, question, objective or attempt to prove an idea.
- The argument consists of a series of premises, or declarations, which should each be supported by evidence or other argument.
- Premises are built up, lead into each other, or are connected by inferences, logic or reasoning.
- Assumptions may inform, group, prompt or constrain premises and evidence. They may also inform or determine the logic.
- Premises lead to claims; statements or positions of what is believed to be true.
- An argument concludes with an opinion, claim or position.

Arguments must be persuasive and reflective of the critical thinking. The writer must be able to convince the audience that each of the claims and conclusions are valid. The audience may know the subject, and even recognise many of the flaws in its contemporary thinking. Argument must be convincing irrespective of whether the writer proffers his or her own opinion, or chooses to agree with or adopt the opinion of someone else. The audience should also be convinced irrespective of whether they agree with the writer's position or beliefs. Evidence and logic are essential to convincing the reader of the truth of claims.

Evidence should be supportive of the argument and well founded (accurate, convincing, well articulated, current, and based in its own right on substantial and convincing evidence). Platts (2009) suggests initiating an argument by asking a series of questions:

- What needs to be true to support my ideas (claims)?
- What theoretical basis is there to support my ideas, or what theoretical base considers similar issues that I wish to argue against?
- What factual evidence is there for my argument (typically literature or empirical evidence in surveys, cases or experiments)?
- Can I find the evidence I need?
- Is this evidence available and easily accessible, and where and how can I obtain it?
- Is there enough evidence to support my ideas (claims) or should I be less ambitious and reduce the focus of my work or think again?

Logic defines the overall structure and flow of an argument. Windschuttle and Elliot (1999) describe logic as "*the study of correct and incorrect reasoning and the application of correct reasoning.*"

Research logic may be regarded as the sequence in which theorising, hypothesising, observing and empirical generalisation are conducted (Wallace, in Vuorimaa, 2005), illustrated in Figure 6 below. Wallace's model has implications for the structure of the argument:

- Does the writer commence with a literature review (theories), devise a hypothesis or synthesise a theoretical position, and then test it? This is a **deductive** logic, which Windschuttle and Elliot regard as arriving at a conclusion that is inherent in the premises and where the arguments are either valid or invalid according to correctness of the logic.
- Does the writer commence with observations and use the literature review to help formulate empirical generalisations and hence theory? This is the **inductive** argument, regarded by Windschuttle and Elliot as one that examines the real world to find evidence towards a conclusion, with arguments that should be assessed according to whether they are weak or strong.

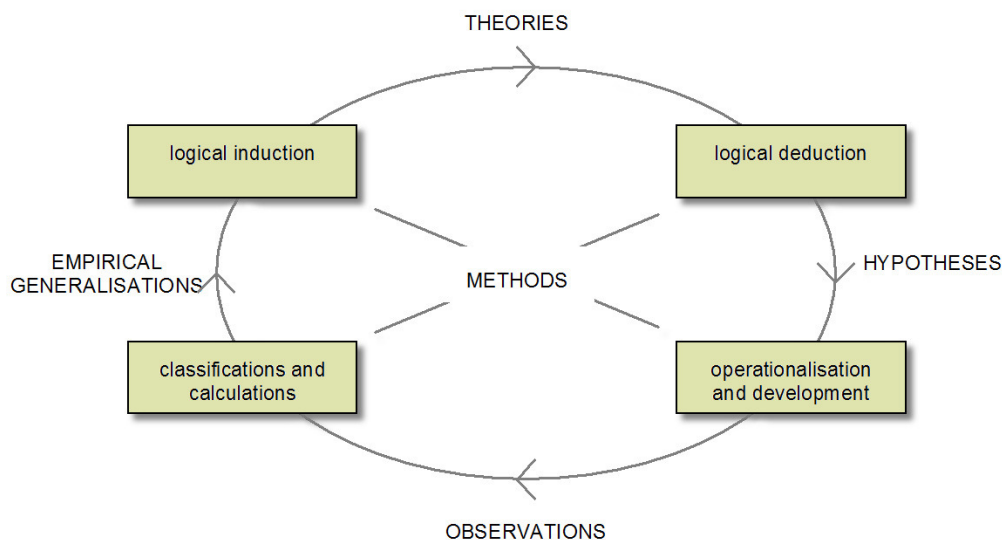


Figure 6: Wallace's Model of Research Logic

The soundness of an argument is a property called *validity*. Several criteria are frequently used by examiners to evaluate student research and arguments. These will be discussed in detail in section 8.5.

4.9.10 Applying critical thinking

This section has purposefully set out to describe critical thinking in the context of academic writing. Readers will be introduced to the idea that critical thinking is a process, and shown how to apply critical thinking to the generic sections of an academic paper.

The topic

The topic may be predetermined, in the form of a question or assignment. Thinking critically about a set question means identifying the expectations of the examiner, producing the appropriate answer, and citing relevant and expected theories and literature. Consider the meaning of the question in the examiner's terms, and avoid interpreting the question according to the answer or argument you wish to provide. Furthermore, understand the analytical stance and critical thinking strategy that is expected.

The topic may also be at the discretion of the writer. An open subject is a particularly relevant problem for Masters and Doctoral students seeking a dissertation topic. Topic selection is discussed in great length in a variety of academic guides, but it bears mentioning (or reminding) that critical thinking begins at this stage. Asking critical questions will help isolate a manageable, researchable and academically interesting research area and suitable analytical stance.

The literature review

A good literature review enables the writer to authoritatively inform and construct an argument. Critically reviewed literature performs several functions. It offers published evidence, logic and positions that the writer may build upon. A critical review may reveal gaps or flaws in the relevant body of knowledge, expose or question unchallenged assumptions, and inject creativity and progress into the field. A powerful application for theory is as a framework. Theoretical frameworks underpin a hypothesis or position, they may be used to compare situations against (i.e. theory says X, but Y happened on the project), and also offer criteria by which to assess what occurred or what was observed.

Research logic affects the employment of a literature review. A deductive approach would typically use a literature review to gather existing theories and formulate a position or hypothesis – an untested theory about the topic. Used inductively, a literature review informs the construction of an emerging theory and helps validate conclusions.

A **critical analysis of literature** would examine whether claims and positions are logical, unambiguous, impartial, supported by evidence, internally consistent with other premises in their argument, and assess whether the conclusions are supported by arguments and evidence. Rice (2004) feels a critical analysis of literature should:

- Highlight the point the author is making.
- Contextualise the argument.
- Provide a counter argument.
- Weigh up what has been said.

A **critical evaluation of literature** would adopt a more questioning stance, supplement the advice offered by Rice (2004) as follows:

- What are the key relevant theories?
- Who are the key relevant authors?
- What are their positions and claims?
- Are these positions and claims valid?
- What are their strengths and limitations?
- Have these positions been challenged? How?
- Is the literature a well-regarded classic?
- Is there later theory that refutes or updates it?
- Does the author use persuasion or argument?

As critical evaluation involves judgement, the writer may ask probing questions. When looking at literature, ask whether the author is stating, implying, assuming, accepting or refuting? Is their choice of literature significant, convenient, lazy or informed? Ask what assumptions have been made, and why? Do the conclusions stand up to any common sense evaluation? Ask what has been included, what has been left out, and why? Importantly, also consider your opinion on the issue.

It is worth noting that an examiner will question the literature review by asking questions:

- Is the reviewed literature current?
- Is the review sufficiently comprehensive?
- Is the review relevant to the topic?
- Does the review support the argument?
- Does the review consider the target audience?
- Does the review express an opinion?
- Does the review arrive at a conclusion or position?

It is suggested that writers begin mapping their argument as soon as they engage with literature and develop an understanding of the topic.

Analysing situations

Many phenomena can only be examined through analysing situations in which they appear, and situations are usually far more complex and affected by a greater breadth of factors than theory suggests. Discovering the causes of situations and drivers of behaviours is a key objective for analysis, but it can be the most challenging aspect of real-world research.

The starting point for analysis should be the theory that emerged during the literature review. Theory forms an important framework for analysis, as it should be used to identify, compare and evaluate behaviour and actions. Linking analysis to theory also ensures relevance, where problems are looked at from the perspective of the topic. A project management student should, for example, look at the problem from a project perspective and use project management theory.

Using the theoretical framework also helps ensure impartiality. This means the bias of the observer ideally should not affect the interpretation. In practice this is difficult, so observers need to recognise the effect of their position and limit its impact wherever possible.

Critical analysis of a situation involves asking questions similar to those asked of literature:

- What happened?
- Where and when did it happen?
- How are the events related?
- Are place and chronology significant?
- What triggered the events?
- What were the causes and underlying issues?
- What were the outcomes?
- What could have been done differently?
- What would the alternative or likely outcomes have been?
- What conclusions may be drawn from this?

Critical evaluation of a situation should build on this analysis by:

- What are the criteria that may be used to assess the situation?
- Judging efficiency.
- Judging effectiveness.
- Judging soundness of decisions made.
- Draw recommendations.

Preparing a case study helps record a situation and grounds subsequent analysis. Headings derived from case studies in Yin (2003) and Tellis (1997) provide an analysis template:

- Context - background and environment.
- Summary of project and approach.
- Project aims, objectives and deliverables
- Project metrics; including budgets, expectations and drivers.
- Organisation; including roles, participants, structure, decision makers and stakeholders.
- Project timeline/schedule.
- Project and decision evidence.
- Outcomes for project and business
- Conclusions and recommendations.

4.9.11 Conclusions about arguments

Argument leads to a conclusion. Conclusions that have been derived using deductive research logic should confirm or refute the hypothesis or research problem; and summarise the key theory, main findings and supporting evidence. Inductive research on the other hand should conclude with the theory that has been produced, and summarise the supporting theory, findings and evidence. No new evidence or theory should be lead in the conclusions.

Writers should ensure the conclusions address the following questions:

- Do the conclusions answer the assignment, research aims and objectives, or the problem?
- Are the conclusions supported by argument and evidence?
- Is the writer's position clear?
- Are limitations clearly stipulated?

The product of the argument may be an opinion, a claim, a position, a proven hypothesis or even recommendations.

Claims may be classified as positive and normative (Talesi, 1999). Positive claims are descriptive and describe how things are through statements of causation, comparison, explanation, observation, prediction and relationship. Normative claims on the other hand judge the importance, morality or value of something, and describe how things ought to be or should have been.

Claims should not be unsupported, by the evidence led or by the argument. Students and even authors frequently make claims as to the applicability of their findings and theories; yet their evidence, subjects, context and even methods often cannot support such claims.

What is an **opinion**? According to Platts (2009), it is:

...the view-point or conclusion you come to after considering the evidence for or against a particular theory (analysis/explanation of events) and with reference to factual evidence or the logic structure of someone else's argument. Opinion in academic terms has to be demonstrated using evidence. The role of students is to select evidence which is appropriate and present it in such a way that any intelligent person could come to a similar conclusion (opinion).

Recommendations are appropriate if the paper is aiming at improvement or change, or if the topic is a practical subject like project management. Recommendations should be practical, relevant to the topic of the paper, relate to the argument, and be supported by the theory and evidence.

More discussion about conclusions will be presented in Chapter 14.

4.9.12 Writing up

A well thought out critical analysis or evaluation needs to communicate ideas properly if it is to persuade the reader. Even a good argument with few limitations will fail to convince the reader if it is poorly written. Well-written papers improve communication, clearly reveal and lead the reader through the argument, ensure key points are conveyed in a timely, appropriate and convincing manner, and ensure the reader arrives at the intended conclusion.

A writing style guide will not be provided here. Rather, the aim is to offer guidance on how to write up critical thinking so as to optimise the intended effect. Common mistakes encountered whilst marking assignments suggest attention should be paid in particular to the following areas:

Structure

Structure helps the argument to flow and to convince:

- Structure may be a grouping of premises, claims and supporting evidence that help the reader to understand the argument and appreciate its validity.
- Use headings to group concepts, to signpost the route, and use the title to grasp and inform the reader.
- Use paragraph and sentence structure to lead the reader through the discussion (Gopen and Swan, 1990).
- Introduce the topic and problem in a way that engages and interests the reader. Readers need to understand the context of the work, and will want to enjoy reading it.
- Make sure the paper reflects the topic, logic argument and methods used. Choose the appropriate research logic, analytical stance and critical thinking strategy. Do not blindly apply a template structure if that is not appropriate.

Terminology

Writers can use terminology, jargon, obscure language and even convoluted grammar in a way that makes reading difficult and alienates the reader.

- Readers should not feel inferior for not understanding what should be a comprehensible subject (Gopen and Swan, 1990).
- Defining ambiguous, vague or disputed terminology is a good habit for academic authors to get into. Definitions inform readers who are new to the subject, confirm the writer's knowledge of the subject, and establish what perspective the writer has chosen to adopt.
- Illustrating terminology through using examples reveals an ability to relate and apply theory and concepts to real world situations.

Language style

Style of language can subtly affect the readability of the writing and influence the attitude of the reader:

- Don't use forceful or emotive language to persuade. Logic, argument and evidence should be used instead.
- Use eloquent language to make reading enjoyable. Dry points may be technically correct, but can make progress difficult and boring. Difficult passages detract from the reader's ability to follow the argument.
- Care should be taken over use of pronouns like 'this,' 'that', 'it' etc. Opening a paragraph by saying "*This...*" forces the reader to retrace steps to remember what the writer is talking about.
- Excessive quotes demonstrate laziness to reword or interpret. Quotes should be context related, relevant and illustrative.
- Improving one's general literacy, diction and grammar will improve understanding and help articulate arguments.
- Writers who are familiar with the terminology, abbreviations, discourse and theoretical positions of the field being studied are better able to understand and correctly interpret literature.
- Writers can make their work unnecessarily incomprehensible through the use of jargon, subject specific language and excessively obscure or uncommon diction. Writers should demonstrate they know the language of the field, and find a balance between writing for a specific audience and writing in a manner that is accessible to a wider audience.



Useful tip: refer to Manchester University's Phrasebank for useful commonly used ways of expressing yourself. See recommended reading for a reference.

Writing as thinking

Many people construct and document their arguments whilst writing. Writing as a way of thinking does not work well at the macro/strategy level or during the conceptualisation stages. Writing should begin once the core of the argument has been established.

Critical thinking and writing in an unfamiliar language can be difficult. Concentration and train of thought can be disturbed by translation and difficulties in properly expressing oneself. The strategy of writing the paper in a home language and then translating it can be tiresome, and isn't optimal in the long term.

Experience with international students suggests critical thinking in all cases should begin with gathering the knowledge, then structuring thoughts before articulating them in writing. Useful techniques include argument mapping (Twardy, 2004) and mind-mapping (Buzan, 2000). A suggested process is to:

- Build a mind-map or model of the problem, its components and relationships, and the relevant theory and literature. This allows the writer to conceptualise the various elements, gain an understanding of their relationships and the dynamics of the situation, and to quickly identify and remember all the concepts and issues to be discussed.
- Then build an argument map so as to structure the discussion into clear paragraphs and sections. This will keep the thinking critical and on track.
- Identify positions and potential conclusions. This will keep the discussion focused.
- Begin writing, with frequent reference to the argument map as a guide.

Skills required to think critically

The critical thinker needs to employ a variety of skills. This begins with reflecting on and continually practicing the capabilities and adopting the stances. Facione (1998) identified the six core skills of critical thinking to be self-regulation, interpretation, analysis, inference, explanation and evaluation. Hargreaves and Grenfell (2003) take a different approach in relating critical thinking skills to student learning outcomes. Their model shown in Table 5 below is intended for science and mathematics research, but it is still valid in other contexts.

4.9.13 Concluding critical thinking

This section has considered critical thinking from the perspective of a student or novice author who wishes to think and write in a more academic and analytic style. Critical thinking has been shown to be a complex activity that entails adopting a mindset and applying a range of skills. It is practically inseparable from arguments, logic, evidence, analysis and the process of writing. Critical thinking can be learnt through a process of observing, analysing, reconstructing and communicating. Several processes have been described and an extensive number of references are provided for further reading.

4.10 Notes for plagiarists and ghost-writers

Make no bones about it, supervisors and tutors detest having to mark and deal with students who are not prepared to put the time in to research and write their dissertations themselves. Cheating lowers the standard of research, gives the university a bad name and encourages others to do the same. This section serves two purposes; it provides tutors with helpful hints, and it provides potential plagiarists and ghost-writers with extra reasons not to cheat.

1. Good supervisors and tutors should be able to spot generic proposals as a potential risk, particularly if the language used by the student differs from previous coursework and exam papers they have submitted:
 - a. Review the student's previous work
 - b. Ask the student to explain their research choices.
 - c. Has the student adopted a different perspective, focus on a particular area, change their subjects or sample, or change their research method?

Skills	Objectives (student learning outcomes)
Designing experiments and testing hypotheses	Understand the need to isolate and control variables. Select appropriate experimental techniques. Use adequate sample sizes and avoid sampling bias. Distinguish observations from inferences. Critically evaluate the validity and reliability of data. Establish relationships among variables. Use inductive and deductive reasoning. Calculate uncertainties. Understand the limitations of extrapolation. Use sound statistical approaches.
Analysing arguments	Distinguish among data, opinions, and interpretations. Structure an argument to support a proposal or interpretation. Distinguish among premises, reasons, and conclusions. Judge the credibility of an information source. Identify relevant components that are missing from an argument. Recognise common fallacies (e.g. circular reasoning, irrelevant reasons).
Solving problems	Restate the problem and the goal in order to consider different problem-solving approaches, particularly with ill-defined problems. Represent the problem schematically. Develop mathematical models. Design algorithms. Select appropriate problem-solving strategies. Consider useful analogies. Make sound decisions on the basis of critically reflective processes. Appreciate the value of persistence.
Thinking creatively	Demonstrate insight in recognising a problem. Recognise patterns and visualise data. Recognise and critically evaluate a number of solutions to a problem. Select relevant information in relation to a problem and make unusual connections.

Table 5: Critical thinking skills

2. Regular supervision reveals how ideas have evolved and allows suggestions and corrections to appear in the final work. Experience shows that an overly high proportion of students who did not attend supervision turned out to be plagiarising or ghost-writing:
 - a. Insist on regular supervision and submission of work.
 - b. Insist on suggested changes being made.
 - c. Require notes and hand-collected evidence to be presented.
 - d. Submit students who have avoided supervision to a viva.
3. Use technology:
 - a. Use a Google search on phrases taken from throughout the dissertation to establish whether work has been plagiarised.
 - b. Follow up on sources of diagrams that have been copied into the dissertation. Students who do this often copy other content too.
 - c. Request an electronic copy of the dissertation, and submit it to electronic checking services like Turn-It-In.
 - d. Use online language translators to reverse engineer particularly obtuse language back to the language of the student and try a Google search on that language. The language may not be readable, but the references, citations diagrams and section headings often give the student away.

4. Consider the data carefully. The sources should be available and accessible to the student, the amount of data should be plausible, and the answers provided by respondents should reflect their demographic and the conclusions drawn.
5. Consider the overall argument of the dissertation, as plagiarism of sections may cause a disconnect somewhere between the aims and objectives, literature review, methodology, findings and conclusions.
6. Consider the citations and particularly missing references. Lazy people tend to make mistakes when it comes to the details.
7. Look for changes in font, terminology and layout. Again, simple mistakes!
8. Changes in language style, general diction and topic-specific terminology are relatively easy for native English speakers to spot, but hard for plagiarists to rewrite out.
9. Be concerned if students can't answer basic questions about their work like "*what are the key theories?*" or "*why did you choose that method?*"

4.11 In summation

This chapter guides the student through planning the series of activities needed to complete the dissertation. Ethics forms are discussed, and a range of useful skills are introduced that will improve the preparation and quality of the dissertation.

Task 7. Acquire the skills

Read through the contents of this chapter carefully, review the skills and practice them. Visit the library, visit the Internet sources provided and search for more. Prepare a mind-map of what you have learnt already and practice writing a paragraph or two using a critical thinking approach.



4.12 Recommended reading

- Beyer, B. (1987) *Practical strategies for the teaching of thinking*, Allyn and Bacon, Boston
- Browne, M. and Keeley, S. (2001) *Asking the right questions: a guide to critical thinking*, Prentice-Hall, Upper Saddle River, N.J.
- Buzan, T. (2000) *The Mind Map Book*, Penguin Books
- Buzan, T. and Buzan, B. (2006) *The Mind Map Book*, Educational Publishers, Harlow, England
- Clark, D.R. (2008) *Critical Reflection*, Big Dog and Little Dog, available online at <http://www.skagitwatershed.org/~donclark/hrd/development/reflection.html>
- Cottrell, S. (2005) *Critical Thinking Skills*, Palgrave Study Skills
- Crème, P. and Lea, M. (1997) *Writing at University: A Guide for Students*, Open University Press
- Denscombe, M. (2002) *Ground Rules for Good Research*, Open University Press
- Facione, P.A. (1998) *Critical Thinking: What It Is and Why It Counts*, California Academy Press
- Facione, P.A. and Facione, N.C. (2007) *Thinking and Reasoning in Human Decision Making: The Method of Argument and Heuristic Analysis*, The California Academic Press, Millbrae, CA
- Fairburn, G. and Winch, C. (1996) *Reading, Writing and Reasoning: A Guide for Students*, SRHE and Open University Press

- Fisher, A. (2001) *Critical Thinking: An introduction*, Cambridge University Press
- Gopen, G.D. and Swan, J.A. (1990) "The Science of Scientific Writing", *American Scientist*, Vol. 78, pp. 550-558
- Hargreaves, M.H. and Grenfell, A.T. (2003) "The Use of Assessment Strategies to Develop Critical Thinking Skills in Science", ATN Evaluations and Assessment Conference, Hilton Hotel, Adelaide, 24 - 25 November, available online at <http://www.unisa.edu.au/evaluations/Full-papers/HargreavesFull.doc>
- Johnson, R. H. (1992) "The problem of defining critical thinking in Norris, S.P. (Ed.) *The generalizability of critical thinking* (pp. 38-53), Teachers College Press, New York
- Kutieleh, S. and Egege, Y.S. (2004) "Critical thinking and International students: A marriage of necessity", *First Year in Higher Education 2004 Conference: Dealing With Diversity*
- Leeds Metropolitan University (2012) "Skills for Learning", available online at <http://skillsforlearning.leedsmet.ac.uk/index.shtml>
- Metcalf, M. (2003) "Author(ity): The Literature Review as Expert Witnesses", *Forum: Qualitative Social Research*, Vol. 4 No. 1, January
- Monk, P. (2001) "Mapping the Future of Argument", *The Australian Financial Review*, May, available online at http://www.austhink.org/monk/Argument_Mapping.doc
- Murray, R. (2005) *Writing for Academic Journals*, Open University Press, Maidenhead, England
- Northedge, A. (2005) *The Good Study Guide*, Open University Press
- Paul, R. (1990). *Critical Thinking: What Every Person Needs to Survive in a Rapidly Changing World*, Center for Critical Thinking and Moral Critique, Rohnert Park, California
- Platts, M. (2009) "Critical Analysis, Argument and Opinion", University of Sussex website, available online at <http://www.sussex.ac.uk/languages/1-6-8-2-3.html>
- Resnick, D.B. (2010) "What is Ethics in Research & Why is it Important?" *National Institute of Environmental Health Sciences website*, online at <http://www.niehs.nih.gov/research/resources/bioethics/whatis.cfm>
- Rice, G. (2004) *Critical Reading, Thinking and Writing*
- Scriven, M. and Paul, R. (1996) "Defining Critical Thinking", A draft statement prepared for the *National Council for Excellence in Critical Thinking and Instruction*, available on-line at <http://www.criticalthinking.org/University/defining.html>
- Talessi (1999) Teaching and Learning Resources, *The Talessi Project*, University of Greenwich, available online at <http://w3.gre.ac.uk/~bj61/talessi/>
- Tellis, W. (1997) "Introduction to Case Study", *The Qualitative Report*, Vol. 3, No.2, July, available online at <http://www.nova.edu/ssss/QR/QR3-2/tellis1.html>
- Twardy, C.R. (2004) "Argument Maps Improve Critical Thinking", *Teaching Philosophy*, Vol. 27 No. 2, June
- Varaki, B.S. (2006) "A Reflection on Three Web-Based Teaching Critical Thinking: Toward A Compromise Approach", *Journal of Faculty of Educational Sciences*, Vol. 39 No. 2, pp. 177-191
- Vuorimaa, P. (2005) "How to conduct scientific research", *Research Seminar on Digital Media*, Helsinki University, February
- Wallace, W.L. (1969) *Sociological Theory*, Aldine, Chicago
- Webster, J and Watson, R.T. (2002) "Analyzing the past to present for the future: writing a literature review," *MIS Quarterly*, (26:2) pp. xiii-xxiii
- Windschuttle, K. and Elliot, E. (1999) *Writing, researching, communicating: communication skills for the information age*, 3rd ed., McGraw-Hill, Sydney
- Yin, R.K. (2003) *Case Study Research, Design and Methods*, 3rd ed. Sage, Newbury Park

5 Choosing a topic

The biggest single challenge encountered by students in the early stages of their dissertation is the choice of topic, as succinctly summarised by Jasimuddin *et al.* (2005):

“Exploring a researchable topic and narrowing it down sufficiently to make it workable is a first task in any scientific research. This is particularly difficult when the researcher is a novice, because s(he) is unlikely to be properly aware of what the essential issues and the research question(s) in the field are.”

Often too much time and energy is wasted on finding a researchable subject. Unsuitable topics then lead to problems finding relevant literature, insufficient data and difficulties in analysis and interpretation. This chapter will offer some practical advice on choosing a topic.

5.1 Identifying a researchable topic

Students often spend a lot of time searching for a key problem affecting a subject or wishing to create new theory. Some on the other hand are not particularly concerned about their topic. As one student of mine once remarked:

“I don’t mind what topic, as long as you tell me what it is.”

Whilst novelty is always applauded, students should be more concerned with the quality of their research and the time required completing it.

Dissertation topics and questions may be identified through reviewing subject literature, but this is an imperfect solution. Well-documented or thoroughly debated theoretical problems may be difficult to research. Popular topics offer abundant literature and opportunities to pool knowledge, but offer fewer opportunities for originality. Examiners may also know the subjects quite well and therefore find it easier to identify poor research or find marking quite monotonous.

Selecting a suitable methodology and method are complex decisions. Some, like Holden and Lynch (2004), feel that the choice of research methodology should be based on the researcher’s stance and on the phenomena being investigated. Others like Daniel (1996, in quoting Kerlinger) feel the choice should be more concerned with the best way to develop and test a theory. My undergraduate and postgraduate students are strongly advised to consider choosing their research topic, questions, methodology and methods on the basis of available literature and data. This is consistent with the position taken by Holden and Lynch (2004), and, in so doing, many research decisions are simplified and sufficient material is readily available for the student to proceed to completion.

Gaining sufficient knowledge in order to make an informed decision is not easy since research is a broad and deep subject. Taught research modules can help, but many are limited in their focus on quantitative treatment of data, statistical analysis, and survey and questionnaire instruments. Quantitative research is arguably an inappropriate strategy for studying phenomena that involve people, including management in its many forms. In most cases it will be difficult to impossible to separate the subject from the context, and phenomena may be very subtle and influenced by a wide range of factors. Experiments are not suited to the study of social and socio-technical phenomena like the management of projects, information systems and construction. Observation and interpretation can also influence the subjects and the findings. Questions require careful design and pilot testing, accurate sampling, careful implementation, good data recording and comprehensive data analysis. Experience suggests that most undergraduate and many postgraduate students have insufficient understanding of question design, deployment of instruments, and inferential statistics to administer these techniques correctly and derive valid conclusions.

Data gathering is an activity that is seldom adequately planned for. In addition to choosing phenomena that are difficult to research, students are inexperienced, have too little time to solicit respondents, face ethical issues that dissuade engagement with human subjects, and are hampered by a distant relationship between industry and academia. This leads to limited access to respondents and the phenomena, poor observation opportunities, low response rates to surveys and excessive reliance on responses from fellow students and academics.

5.1.1 Sources of research problems

McMillan (2010) and others suggest a range of alternative sources for research problems:

- Personal sources:
 - Casual observation.
 - Intuition.
 - Reading.
 - Personal interests and experience.
- Experience based:
 - Academic experience.
 - Work experience.
 - Exposure to the field and its problems.
 - Practical situations and events.
 - Consultation.
 - Brainstorming.
- Theoretical sources:
 - Mathematic propositions.
 - Deductions from theory.
 - Comparing theory with practice.
 - Gaps in the literature.
 - Problems identified by other authors.
- Professional sources:
 - Current political, economic, social and technological issues/problems.
 - Policies and procedures.
 - Evaluations, assessments and measurements.
 - Statistics and trends.
- Research based:
 - Replication of previous studies.
 - Checking the findings of a major study.
 - Applying research used on one subject to a different subject.
 - Checking trends or changes.
 - Checking important findings using different methodologies³.
 - Clarification of contradictory research or debates in the literature.
 - Repeating past research to determine if it is still applicable.
 - Follow-on research, the recommendations and extrapolation of previous work.

³ Students are referred to the term 'triangulation'.

5.1.2 Researching work experience

Part-time students, foreign students and students with work experience have extra options available to them. The following suggestions and the discussion on data selection in section 8.4 may be of help in selecting a suitable topic.

Work experience means lengthy and deep immersion in situations and subjects. This type of exposure is impossible to attain in the timescales involved in writing a dissertation. Immersion exposes a researcher to nuances and context, resulting in an arguably better understanding of the phenomena and improved understanding of the underlying theory. Students may not be the only ones to benefit from researching work experience. Management research is arguably better informed by practice than by theory. Academic tutors may find the resulting dissertations more interesting to read, experiential insights are a source of research ideas, and this experience can often challenge and enrich the theoretical work of supervisors.

Student work experience is a sound and useful alternative source of research material. As with any subject, appropriate planning and action must be taken to ensure the research is rigorous and valid. This paper will examine what constitutes researchable work experience, propose suitable research strategies (methodologies), and suggest a few of the more common research methods that may be used.

What is researchable work experience?

Work experience refers to knowledge and skills gained whilst engaged in a job, occupation or practice. Work experience confers procedural knowledge, or understanding how to do a task or job. Work experience may be gained through gap-year placements, previous employment or ongoing employment.

Four broad criteria should be met for work experience to be considered 'researchable' and to help avoid what Goldacre (2009) refers to as "outrageous pseudoscientific claims:

- The experience should be *relevant* to the field being studied and the phenomena under investigation. Students studying project management should have experience in managing or coordinating projects. Students examining team motivation should have experience in motivating, not just being motivated.
- The experience should have been acquired by the student practicing in an *emic* role, as an insider rather than as an external observer. Experience gained whilst working with a project team would not normally provide suitable data to draw conclusions about the managing of that team.
- Experience should be *accessible* to the researcher, meaning it is available, in a researchable form, and that appropriate methods can be applied to gather and analyse it. Project documentation, correspondence, emails and other tangible artefacts offer strong and accurate data and support objective analysis. Intangible evidence, such as recollection, tends to be very unreliable, difficult to accurately investigate and validate, and prone to subjective treatment.⁴
- Experience should be *sufficient*. There should be enough data available to comprehensively research the phenomena, and enough cases to make appropriate generalisations. Deep, intensive investigations will require fewer cases but more detailed information about each case, whereas broad but shallow investigation will require many cases.

Suggestion1: Researchable problems at work

Mature and gap-year students often encounter researchable problems or phenomena during the course of their employment. Work experience can yield interesting and relevant research problems the student may have encountered in industry. Illustrative examples taken from recent

⁴ Some like Jankowicz (2001) feel that managers deal with uncertainty all the time, and that managers (and hence management students) should learn to be comfortable with subjectivity.

student dissertations include: adoption of project management in Nigeria, construction procurement practices in the UK, use of value management in the charity industry, and the failure of information systems development in small and medium enterprises.

This strategy simply aims to identify a dissertation topic and/or set of research questions from relevant work experience. In implementing this strategy, students may reflect on the experience to identify issues that affect practice. The problem or phenomena would be described along with context in introductory chapters. The literature review and research questions should then refer to the problem, and conclusions may be followed by recommendations that discuss how the findings or conclusions relate to or could be applied to the original problem.

This strategy is suitable where the data (work experience) is barely researchable, where there are ethical or confidentiality complications, or where the student wishes to examine the problem from a theoretical perspective. Choice of methodology and method will not be influenced by this strategy.

Suggestion 2: Work offers illustrative insights

Work experience can be used to illustrate the application of theory in practice, to inform arguments, and to help explain ideas. Illustrative insights may be used where a non-critical review of theory can be perfunctory, not meet assessment requirements to be critical, and fail to show the student understands the theory.

Insights, anecdotes or observations can represent very weak evidence, even unsubstantiated opinion. Students should document their expertise in introductory chapters so as to establish why their insights are valid evidence for the argument. Relevance is important, so students should ensure the insights have been derived from situations that are similar or relevant to the theory, argument or situation being illustrated.

This strategy is more appropriate when the student has extensive experience, but where the experience is not researchable or weakly relevant, or where the student does not wish to research a specific work experience topic. There will be few (if any) methodical implications to adopting this strategy.

Suggestion 3: Investigating interesting workplace phenomena

The workplace is a good source of interesting and relevant phenomena, and investigating them is particularly appropriate for management since management is practice-based and management theory is arguably focused on problem-solving.

Investigating phenomena is an inductive research approach, a theory or explanation is derived from observations⁵. Investigations can take two forms; describing or explaining. Describing requires accurate analysis of the situation; identifying the what, where and when of what is happening, who is involved and how the situation arose. Explanation involves describing the situation and identifying why it happened.

To investigate a phenomenon, work experience is used to identify a problem and to provide research data. Discussion of context becomes more important in introductory chapters, with the background informing the reader and establishing the relevance of the data. Empirical analysis would then use a suitable method to gather data from the work experience and analyse it. Generalisation of conclusions and recommendations would then be limited to the organisation/s the data was drawn from and/or phenomena with a similar context.

This strategy is appropriate where researchable data is available and the experience is relevant. Broader or deep investigations are both possible, depending on the number of cases and on the generalisations the researcher wishes to make, but investigation is often more suited to intensive investigation of a few cases.

⁵ As opposed to deductive logic, where a hypothesis is proposed and then tested through empirical observation.

Suggestion 4: Comparing theory to practice

Theory and practice diverge in a number of ways and for different reasons. Smith (2006) notes performative contradictions and a mismatch between theory and empirical evidence. Theory focuses on knowledge creation whilst practice is concerned with knowledge application, knowledge exploitation and implementation. Truch *et al.* (2000) see academics, consultants and business as having different agendas and different understanding of fundamental concepts. Comparing theory to practice can highlight and bridge any gaps between these worlds.

“The academic literature is full of advice and descriptions of the advantages to be gained from emphasizing knowledge while practitioners’ accounts alternatively reflect excitement and frustration at the costs and time taken to realize benefits. The two groups are often not quite in agreement about which are the most pressing problems and the order in which they need to be tackled.” (Jacob and Ebrahimpur, 2001)

This type of research will compare theory, which is a generalisation, with practice that is a specialisation. Theory and cases need to be chosen carefully to ensure they cover the same subject areas. Each case’s background should be examined to establish relevance. Theory should then be modelled by identifying and critically evaluating key theories, concepts, entities, and their relationships. Treatment of workplace phenomena will then be critically analysed and differences identified and explained in the findings and conclusions. Recommendations for practice or theory may be produced, and limitations should be treated carefully.

Comparison is suitable when there is researchable data, where there are obvious or important differences between what the student has experienced and been taught, the student possesses good skills in critical analysis and evaluation, and where the limitations are acceptable.

Suggestion 5: Solving a workplace problem

Practitioners implement knowledge and solve problems. Research can be an interactive process, finding solutions and testing their impact. This topic selection focuses on situational improvement whilst developing and testing practical knowledge. Problem solving may be undertaken using an action research methodology. Problem definition, solution identification, implementation and assessment are undertaken iteratively until the project is completed or problem is solved. The literature review can focus on identifying solutions, findings will assess performance and note any changes, and conclusions and recommendations will discuss the value of the solution.

Students considering this strategy require a single suitable case, to be executed concurrent to the research process, and ideally to be completed within the timeframes of the dissertation. This strategy has ethical considerations, particularly around responsibility for project failure.

Suggestion 6: Exploring a new direction

Writing a dissertation will be a unique experience for most students. Some students use the opportunity to study a subject that has interested them, research and prove a hypothesis, or prepare for a new career. In a few cases, students have used the time to investigate, design and even develop an idea they acquired whilst at work.

Proving a theory involves defining the problem, formulating a hypothesis, testing the hypothesis, and making generalisations on the basis of findings. This is a deductive approach, according to Wallace’s (1969) model of research logic (Vuorimaa, 2005).

There are considerable methodological complications to trying to prove a theory through retrospective analysis of data that was not generated from application of the theory. This strategy may only be used where the logical cause-and-effect relationship has not been broken, and it is highly unlikely this would be found. It is therefore recommended that this strategy be avoided by students wishing to use work experience, and investigatory or comparative strategies used instead.

5.1.3 A process for topic selection

The important choice of topic will be made clearer using the following flowchart:

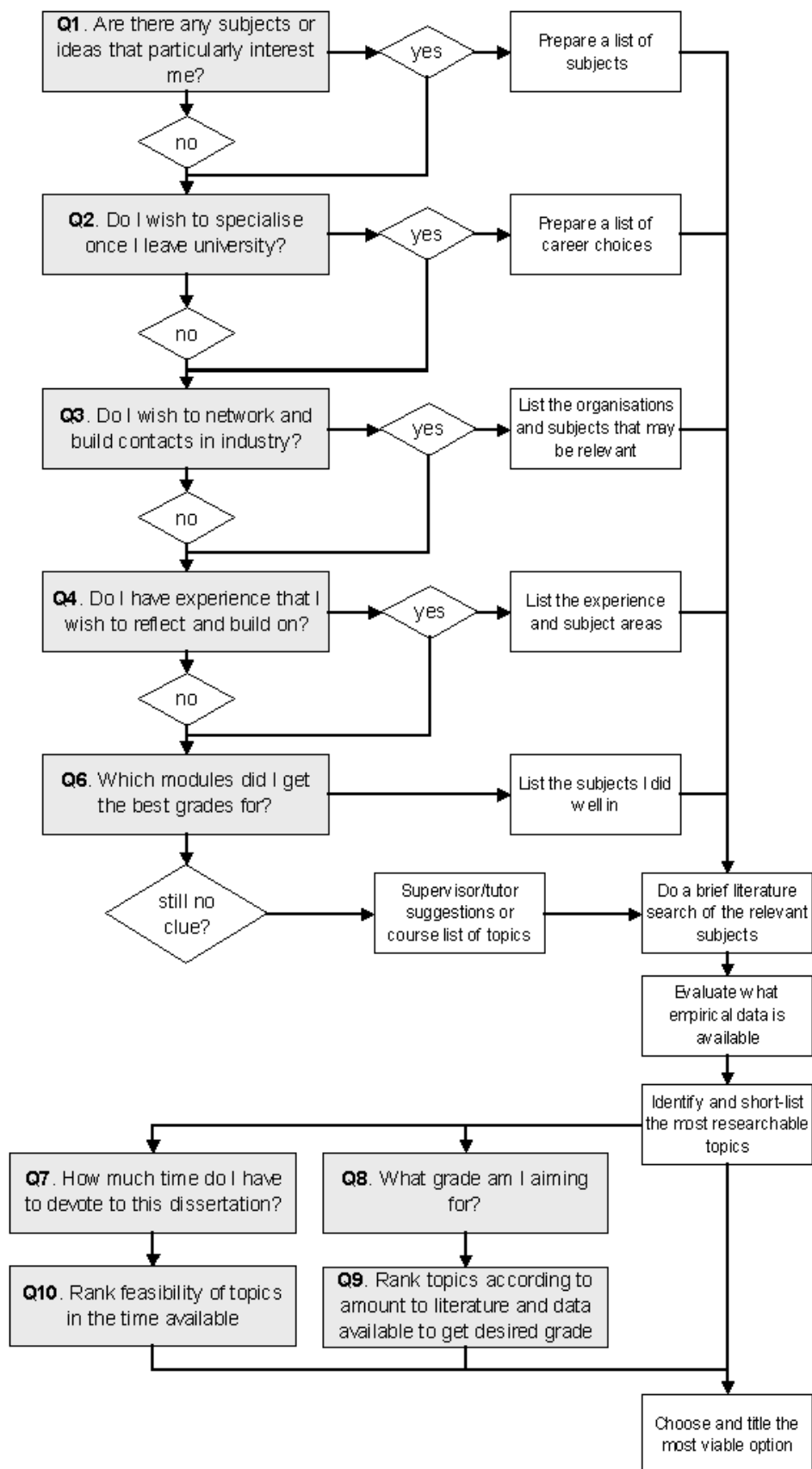


Figure 7. The topic selection process

5.2 Selection based on student circumstances

Broad research strategies are recommended in section 8.4 to students who have limited access to data, international students and students with work experience. These are decisions related to quality and quantity of researchable data and on the nature of the research problem. Please review these before proceeding.

Task 8. Choose your topic

Make a copy of the flowchart in Figure 7. Use a highlighter to mark the most appropriate path through the process. Follow the instructions in the flowchart and make notes as you go. Prepare a shortlist of researchable topics and identify the most viable option with reasons. Keep the marked flowchart and the notes because these will be used to write up a section in the Introduction about why the topic was selected.



5.3 Criteria for good topics

The simple view is that a good topic is one that achieves a good mark with the least amount of effort. There are other characteristics though that may help in choosing between various alternative topics. A topic should:

- Be relevant to the student's course and field of study.
- Be relevant to the student's career.
- Take advantage of any work experience and emic (insider) perspectives.
- Offer benefits to the researcher in addition to completion of the module.
- Be capable of being competently and independently completed within the timeframe.
- Be interesting. Never underestimate the power of an interesting topic to carry a student through some rough patches. Dissertations take time to complete and a boring subject can make the time drag by. Interesting topics also improve the examiner's mood.
- Be easy to explain. If you cannot quickly answer the question "*What are you studying*" to casual friends, then your research is likely to be aimless or difficult to focus.
- Be accompanied by sufficient and relevant literature available from accessible and authoritative sources. Scarce literature will cause problems for the literature review and research design.
- Be capable of expressing as a clear research problem. A broad or vague topic makes it difficult to derive useful and relevant questions.
- Support the application of manageable, common, established research methods.
- Be researchable and the problems capable of being resolved through research. World peace and vehicles exceeding the speed of light are probably insoluble and too ambitious.
- Involve sufficient data to investigate and sufficient access to that data. There is an expectation that researchers should investigate real data and not rely on 'desk research'.
- Enable findings and conclusions to be reliably produced and verified.

Students should avoid the following if possible:

- Subjects that have been over-researched. There will be excessive literature to review, supervisors will be bored and unenthusiastic, students will find it hard to shine, and examiners will know the subject well and easily pick holes in reviews and arguments.
- Controversial subjects, especially those involving philosophical or untestable positions. Students will have to work hard to review the various debates and convince examiners that their claims are valid.
- Topics that will cause intellectual property issues. Universities usually own the rights to student research, and resolving rights issues will be time consuming, distracting and result in compromises and ethical issues.
- Topics with serious confidentiality, secrecy and ethical considerations. Again, these issues tend to be problematic. Students can usually achieve similar objectives by studying public data and topics.
- Attempting to argue social phenomena using logic. Empirical testing or observation will always be required.
- Topics that rely excessively on reflection. Reflection is easily challenged and observations and claims have to be supported with established theory and independent observation.
- Topics that will require arguments and conclusions to rely on value judgements.

Task 9. Evaluate the topic shortlist

Assess the short listed topics in terms of the criteria for good topics. Choose a different topic if necessary. The shortlist should also be reviewed with your tutor or supervisor to find the most researchable alternative.



5.4 In summation

By the end of this chapter, you will have selected and evaluated a shortlist of tentative topics and identified the most viable alternative. The next chapter will show you how to read about the topic and develop your understanding of the subject.

5.5 Recommended reading

Jasimuddin, S.M., Klein, J.H. and Connell, C. (2005) "The paradox of using tacit and explicit knowledge - Strategies to face dilemmas", *Management Decision*, Vol. 43 No. 1, pp. 102-112

McMillan, J. (2010) Educational Research: Fundamental for the Consumer, *Pearson Education*, available online at http://wps.ablongman.com/ab_mcmillan_edresearch_4/16/4150/1062447.cw/index.html

Onions, P.E.W. (2010) "Work Experience and Student Research", working paper, available online at <http://www.patrickonions.org/docs/academic>

6 Read about the topic

How much do you know about your chosen research topic? Students are usually required to produce a research proposal during the course of the research module, and they also need to understand their chosen subject and its issues before deciding on how to study it. Reading about a topic is the first step towards producing a proposal, writing the literature review and developing the research questions.

At this point you need to know enough to be able to:

- Confirm whether the topic really is feasible.
- Identify some of the key theories and perspectives.
- Discover any research paradigms.
- Establish tentative research questions.
- Prepare the proposal.

This chapter recommends the following steps in reading about the topic:

- Understand a bit about reading.
- Ascertain the maturity of the topic.
- Locate primary sources of relevant literature.
- Read the literature, identifying key theories, positions, arguments and authors.
- Prepare maps of the topic knowledge.

6.1 What is 'reading'?

Researchers and practitioners do something called writing. The reasons for performing this act are never simple and seldom involve money. Everyone else can benefit from this strange self-inflicted punishment by performing a familiar sounding but often poorly understood act called reading.

Reading falls under the topic of cognition. How humans think and act is closely tied to their language, to the extent that different languages have been shown to use different parts of the brain and involve different cognitive skills (Harley, 1997). Reading is a process of *internalisation* where information in a written form is processed and mental maps are created in the reader's mind. This process is quite different from another mechanism for acquiring knowledge called *socialisation*, where people learn from each other. Reading is therefore a learning process, not a teaching activity. It is up to the reader to find, acquire, structure, comprehend and store their new knowledge at a pace and in a way that suits them. Like with any skill, it can be improved through practice.

Reading for research and dissertations is part of an iterative cycle. The more you read about a topic the more you begin to understand. The original questions that triggered the enquiry may be answered. It is also likely that more questions will begin to emerge as you get to know the topic. Preparing a dissertation will involve several iterations or turns of the cycle.

Because most subjects are quite vast and because there are many perspectives on a problem, it is quite unlikely that a researcher will eventually reach the end of what is known and written

about a topic! It is also common to encounter literature as you are about to finish that refutes your findings and conclusions⁶.

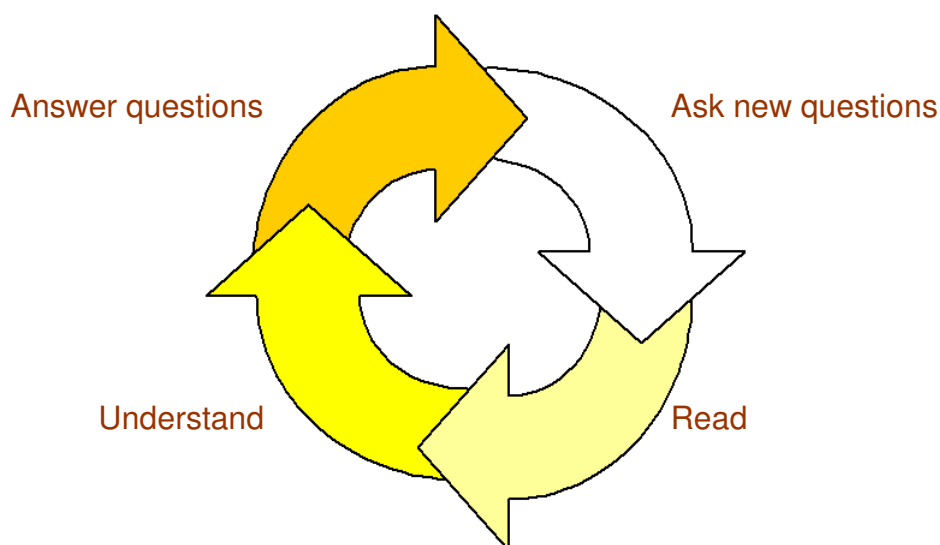


Figure 8: Reading is part of a cycle

If you'd like to know more about reading then Webster and Watson (2002) may be quite useful. There are study skills and tutorials available in most UK university libraries' online sections, and a more comprehensive guide on this and other study skills may be found in Northedge (2005).

6.2 Start your literature search

A literature search is an orderly search for and gathering of enough previously published literature on a particular topic. It serves a number of purposes:

- It is the process by which you will find enough of the right literature to review.
- The search identifies appropriate and authoritative sources and publications.
- Pinpoints key authors, broad concepts and relevant terminology.
- Broadens your understanding of the topic.
- Demonstrates and refines your ability to investigate a subject through its literature.

6.2.1 What literature is suitable?

Literature provides evidence that informs the dissertation argument and underpins research questions. Evidence should be convincing, so literature should meet certain criteria:

- It should be recent, ideally written in the last five years or so.
- It should be relevant to the topic, ideally written with the same context in mind.
- Older work that is frequently referred to may be used, but it will be up to you to check that the ideas have stood the test of time and not been refuted or disproved at a more recent date.
- The publication should be reputable, of good standing and ideally reviewed or edited.
- The author should be writing in a critical manner and supporting claims and opinions with evidence. Avoid rhetoric and emotive discussion that is unsupported.

⁶ Chapter 14 on Conclusions and Recommendations provides some advice on how to deal with this situation, as does the Q&A in Appendix 4.

There are several sources of suitable literature, including:

- Books:
 - Research textbooks.
 - Subject books meant for a general audience, 'airport books'.
 - Handbooks, guides and manuals.
- Reports:
 - Census and government statistics.
 - Public sector research.
 - Commissions and investigations.
- Journals:
 - Print versions.
 - Online journals.
 - Online databases.
- Conferences:
 - Conference paper and proceedings.
 - Conference presentations.
- Lecture notes.
- Media:
 - Trade magazines.
 - Newspapers.
- Internet:
 - Search engine results.
 - Self publishing.
 - Forums.
 - Blogs.
 - Online journals.
 - Company websites.

6.2.2 The literature search strategy

A disorganised search will take longer, discover too much irrelevant material and slow down your comprehension of the subject. There are several strategies for a literature search:

In an **unguided exploration** the student will begin with little understanding of the breadth of concepts involved, and read generally until a broad understanding emerges or a particular model or theory is encountered. This strategy is weak and generally not recommended under any situation, although it may be useful if you are searching for a topic rather than literature about a topic.

A **theory-guided search** uses a theory, model or framework that the student has encountered at some stage. The model will provide keywords, concepts, behaviours and relationships. You will then use the model to structure your search and expand upon each of the terms in the model using the models actual phrases and vocabulary. This strategy assumes you know something about the theory underpinning your topic and have chosen a theory for a particular reason.

A **focused search** seeks specific keywords, subjects, authors or other filtering criteria. Here the student starts by strictly limiting the scope of their search such as only reading about "*boredom*" as found in journals published in Europe, such as the British Journal of Psychology and Scandinavian Journal of Psychology. This can be a very narrow strategy and you should have

to have clear and convincing reasons for doing so. This strategy is probably most suitable when you are very familiar with your subject.

A **wide to narrow search** begins with broad concepts and gradually tightens onto the specific topic. Benefits of this strategy are that it will provide a better understanding of the general subject area, its terminology, the interplay of the different theories and how problems have been resolved. The downside is that a search conducted on a broad topic could discover millions of potential documents, and you will have to focus the topic, narrow your search criteria, or narrow the search to literature from research and practice sources relevant to the course, field or context you are studying. This strategy is useful if you don't know much yet about your subject but are able to quickly focus on the topic.

A **narrow to wide search** begins with literature discussing your specific topic and then widens to include peripheral concepts and general theory that emerged during the search. Often this involves a search for the actual words and phrases in your topic title (an example is provided in the next section). This strategy will quickly place you in the middle of your topic, but you may find yourself lost in the new vocabulary, many new theories and debates. Widening the search will then help make sense of the discourse and the context of the research you have encountered, and it may provide opportunities for comparing the specific to the general. This search is useful if you already know something about your topic or can define it quite tightly.

Search strategies raise two particular problems. The first is discovering **too much literature** and too much irrelevant material. The solution here is to either narrow your topic or narrow your search to focus more specifically on the topic you have chosen. For example, a search for general motivational theory will discover a huge amount of literature, but most of this will not be relevant if you are studying motivation in the military. In this case it will be far more productive to adopt a 'narrow-to-wide' search.

The second problem is a **lack of literature** discussing the topic. In this situation several actions may be appropriate:

- **Change or broaden the topic.**
- Your literature search may be **weak and lazy**. Use more general searches in Internet search engines to identify appropriate terminology and literature, ask the library for assistance in locating relevant journals or books, and if these steps fail then discuss the problem with your supervisor.
- You may be looking for specific discussion when you should be looking for **general theory**. Adopt a wide-to-narrow strategy. There may not be any academic literature discussing the growing of bananas in Manchester, but there could be discussion on growing bananas and other tropical fruit in general northern climates.
- Use **synonymous terminology**. The field may be using a different set of terminology to describe the things you are looking for. By starting with a broad search you will start to identify words that the field uses and your vocabulary will grow. Naturally the definitions you encounter will be reused in writing the literature review.
- There may be no literature written in your **language**. Not every paper or book is written in English, and it may be more relevant to refer to literature published in the geographic region you are investigating. A few words of warning though. Be sure of your translation, particularly of terminology. Be prepared to have this research challenged. And do not be tempted to plagiarise as there is a good chance that this literature would have found its way into Turn-It-In.
- You may not be **thinking critically**. You may be looking for literature that proves your point rather than looking for theory or discussion that is unbiased. If you are researching banana growing in Manchester then you need to look for research that explains why this type of agriculture is likely to fail.

6.2.3 The literature search process

It will be difficult to describe a universal literature search process. There are different search strategies and a search is an iterative process; you will read something, discover an interesting point, and that will lead you to the next article. The following example illustrates a narrow-to-wide search strategy for a literature search on a topic entitled “*The relationship between project team structure and efficiency*”:

1. Break the topic down into its constituent elements or concepts. In this example there are three major elements, “projects”, “team structure” and “efficiency”.
2. Set limits on the search based on how much information you want to collect and how broad this needs to be. Do you want to gather all definitions of efficiency, or just those that examine project efficiency?
3. Start by using the topic’s terms to begin a database search using the library search engine and any online academic repositories you have access to.
4. Discuss the topic with university librarians and use the library catalogues.
5. Locate those journals, conference proceedings and books that the academic databases and the library suggest.
6. Analyse the references and bibliographies given in books, journal articles and conference papers. These will point to other relevant work.
7. Now widen the search. Use a general Internet search engine like Google or Google Scholar. In this example the full topic title produced nearly half a million hits on Google. Review the first couple of pages of search results and try to ignore those that are obviously marketing, hype and opinion.
8. Refine the search criteria by using quotations to look for phrases that describe the elements. In this case putting quotation marks around “project team structure” produced forty two thousand hits and these appear more relevant.
9. Quickly read the most interesting hits from the first 5 to 10 pages of search results.
 - a. Note the terminology used. Is the topic title using industry/research standard vocabulary? Are there important keywords or phrases that appear regularly?
 - b. Note the publications these articles appear in. There may be other relevant articles from those sources especially if they are journals. Remember that some sources may be more or less authoritative than others.
 - c. Study the bibliography of each article. The author will be referring to other literature that may be useful to your project.
10. Review general Internet articles like Wikipedia. This is a contentious point because many supervisors and tutors don’t like this practice, but these sites often provide a quick introduction that will serve to orient the student and point to other literature and concepts. Don’t base your argument on these sources however, take evidence from authoritative sources.
11. Finally, consider asking tutors, supervisors, faculty experts and fellow students for advice. There may be subject matter experts in your midst who will have good information on theories and debates, and who will also be able to provide personal insights that may be used anecdotally or even as interview subjects.

 Useful tip: Remember that you will encounter a broad range of concepts during the literature review. It will be counter-productive to try to remember all of these. You **MUST** use a system of structuring your search and recording any information as you encounter it. Applying a structure to the literature search and subsequent writing up will improve efficiency and thoroughness of your exploration, speed of writing up, developing the theoretical argument, conducting analysis and drawing conclusions. Use lists or mind-maps (as shown below) to keep track of what you have read and the concepts you have encountered.

Task 10. Search for literature

Use the steps discussed above to find at least a dozen or so relevant discussions. In so doing you should also have built a list of useful resources and journals in your subject area, acquired a working knowledge of the library, online databases and internet search engines.



6.3 Read the literature

Your search is well under way and you have collected articles, papers and books. Now you need to start building up your understanding of the topic.

It is often best to read the literature as the search discovers it, rather than stockpiling articles and reading them later. The search will evolve and you will be able to fine tune it and locate more relevant material as you go. You also need to be ruthless and immediately dump any article that turns out to be weak or unsuitable.

Reading is an iterative activity that involves comprehension and developing knowledge. The human mind stores knowledge as mental models. New knowledge is attached to existing mental models and takes on the perspective of that model. New knowledge may challenge existing models if it is persuasive and definitive enough, and in exceptional cases may even replace what we already know – it will ‘change your mind’. Models facilitate our comprehension of the world around us.

Visualisation is a particularly powerful way of recognising concepts and their relationships with each other. Techniques like mind-mapping are useful because they clarify and categorise our understanding, and help us separate the ideas we wish to study from all the other context and noise. In terms of critical thinking, reading is usually weakly analytical whilst modelling and visual representation tend to be strongly analytical activities.

A practical example will be used to illustrate step-by-site the process of reading the topic “*The relationship between project team structure and efficiency*”:

1. Use the copies of relevant articles gathered in the literature search.
2. Start reading the articles sentence by sentence. Look for definitions, models, theories, important authors and any key academic and industry debates, particularly those that are repeated. Focus on subjects drawn from the title, namely “*projects*”, “*team structure*”, “*efficiency*” and any relationships between these.
3. Start building a model as discussion emerges. If it is a mind-map then add nodes and branches to the tree using each of the subjects. Use the *in-vivo* terminology (terms used by each of the authors) and don’t try to interpret what they are describing.
4. Remember to record the citation on the mind-map (i.e. *Brown (2001)*) and to record the full reference in the dissertation References chapter at the same time.
5. It may be worth recording a précis of each literature’s argument next to the branch. For example explain the general approach taken by Frame (1995), and explain each of the dimensions in his model. These are quickly reused when producing a literature review.

At this point your model should start to appear something like Figure 9 below.

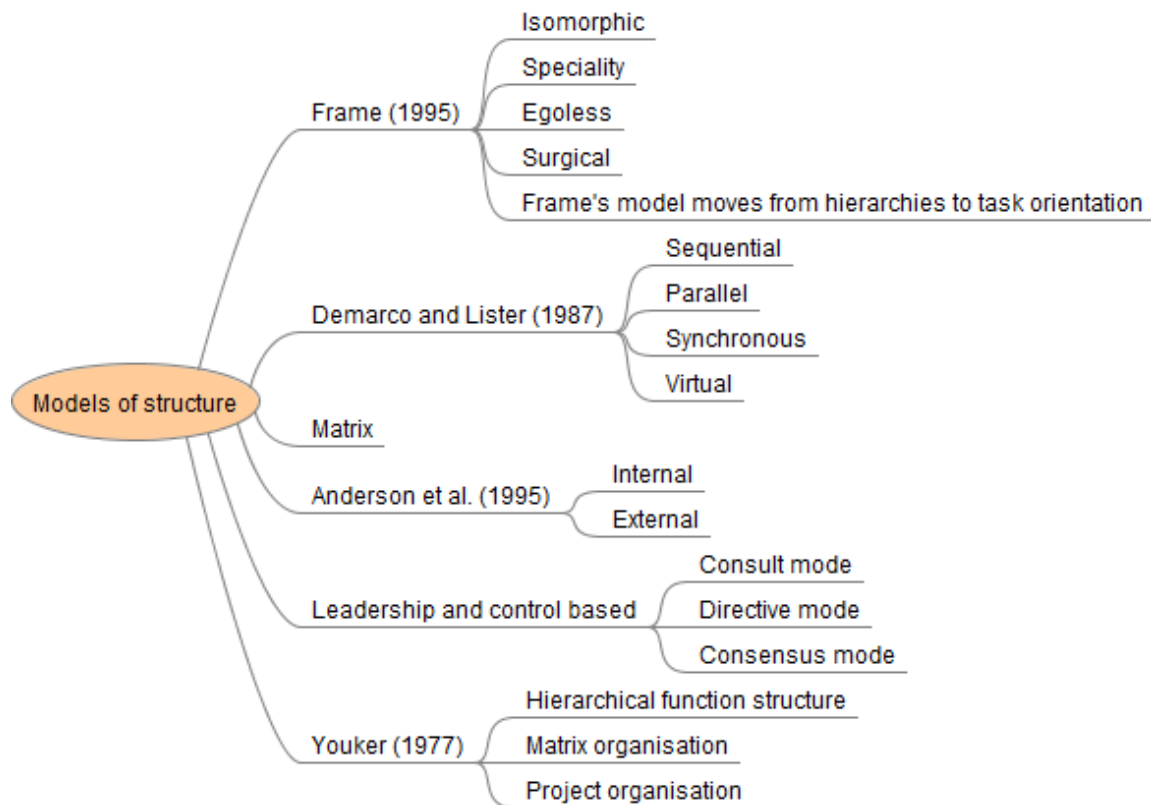


Figure 9: First steps in developing a mind-map

6. Flesh out the model by developing each of the subject areas.
7. Once you have found a fair amount of information and the model is looking well fleshed out, start looking for gaps, contradictions and inconsistencies between the authors. These are areas where there is little information.
8. Once the gaps are filled, examine the model to see if the authors are using different terminology to describe the same things. Make a note of these as this will aid in writing up the literature review (such as by saying “*What Brown (2001) regards as a silo structure, Jones (2008) refers to as a functional structure.*”)
9. Identify tentative research questions and even potential conclusions by studying the concepts and relationships and asking questions based on the seven interrogatives (what, where, when, which, who, why and how?)
10. Does the mind-map (or your understanding of the phenomenon) reveal any gaps or areas where you don’t have enough supporting evidence? If so, now is the time to iteratively expand your literature search and do more reading as you go. Do this until the model looks thorough.

The mind-map presented in Figure 10 shows the result when these steps were applied to the topic example. About a dozen pieces of literature were found to be relevant and these models were constructed over a 2-day period. This may seem an impossibly short period of time, but with practice and knowledge of where to find the literature it can be done!

i Useful tip: There is a lot of information in this dense image. If you are reviewing the PDF version of this document then you should be able to zoom into the image. At 400% even the smallest of text should be legible.

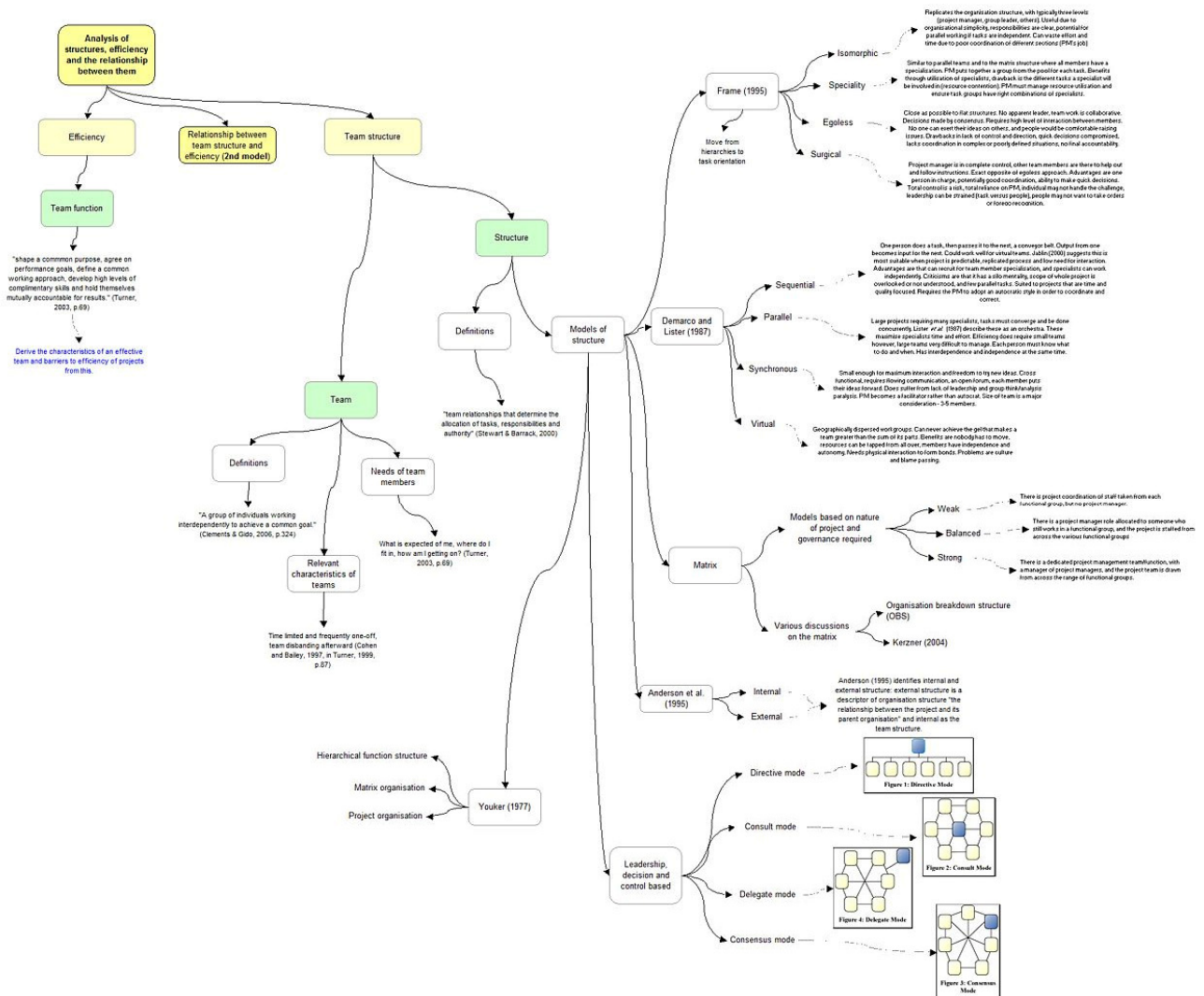


Figure 10: Mind-map of the concepts

Notice how the definitions and various views of several authors are clearly identified. Common themes are quickly apparent from inspecting the map, and can be compared and contrasted. This depth and structure of information is invaluable for writing the proposal and preparing the literature review.

The next model shown in Figure 11 describes the relationships between structure and efficiency that are discussed by these authors. By applying the mind-mapping steps described in section 4.7 the various concepts have been categorised and are now plainly visible. There is enough raw information in this diagram to now prepare a good proposal and a fair literature review.

The model that follows in Figure 12 describes the conclusions that the authors of the reviewed literature came to as well as conclusions that could be drawn immediately whilst reading the papers and inspecting the theoretical models. At this stage these may make good research questions, if only to confirm that they are in fact valid conclusions.

Task 11. Read and map

Use the steps discussed in section 6.3 and apply them to the literature you discovered in your literature search. Do this until your models are thorough.



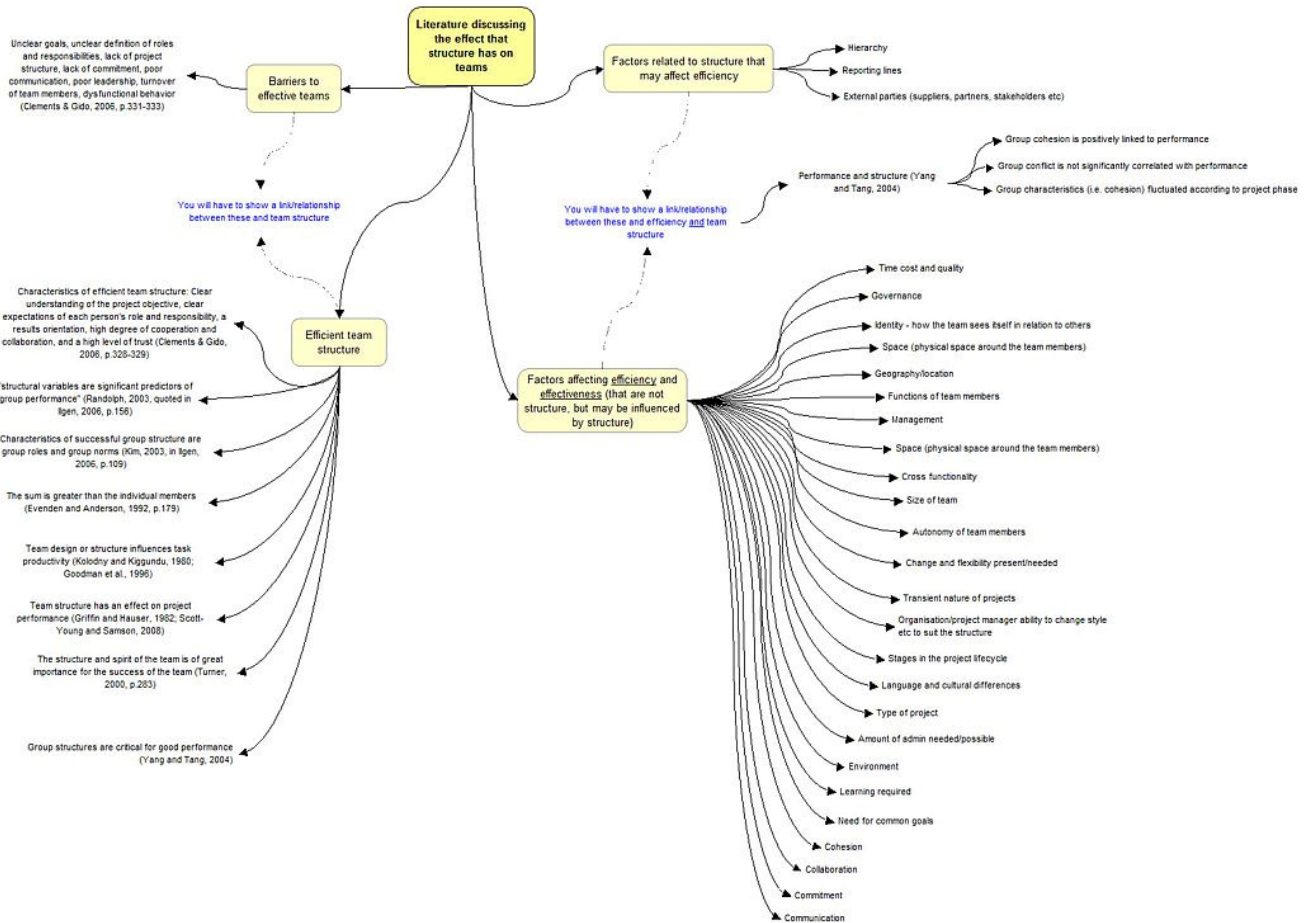


Figure 11: Mind-map of the relationships between concepts

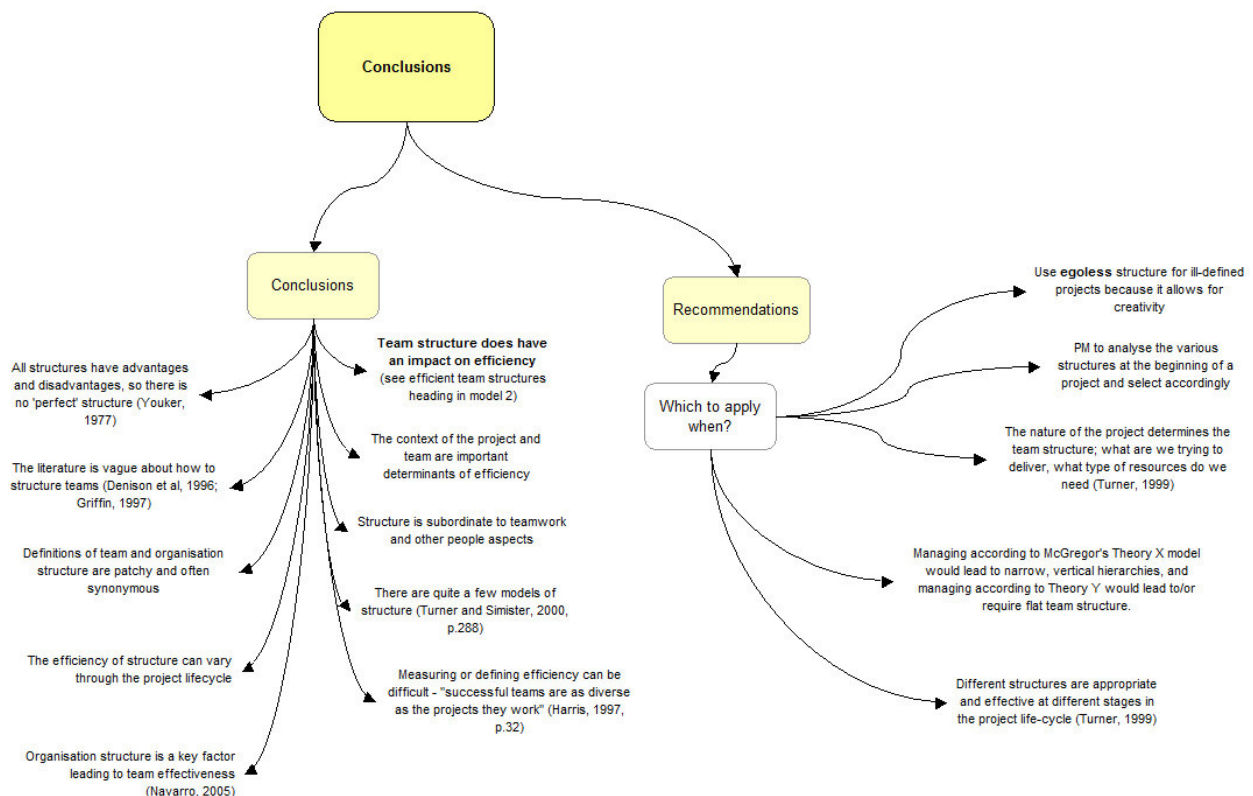


Figure 12: Mind-map of the conclusions

6.4 Establish the maturity of the topic

An important step in your analysis is to determine the state of theory and debate in your chosen topic's field. Maturity may be simply defined as the state of its development and quality of its theory. A mature field would display well-developed theory, clarity and established understanding. An immature field would be new, contain incomplete theory and display a lack of definitions, little clarity, gaps and unresolved contradictions. Observing this is a key conclusion in your literature review and an important consideration in preparing research questions and a methodology.

A review of a **mature topic** will involve identifying the key current theories and debates, selecting the most appropriate ones, and applying that knowledge to the research. There may be established research paradigms and commonly used research methods, and you should strongly consider using them. Your research questions should be based on or take into account the established theories. Your literature review should be careful about challenging theory without having a good knowledge of what others have said about it (and this may be an opportunity for you to investigate all these different positions, aided by a literature search involving citations of the original published theory.)

Reviewing an **emerging topic** will focus on the gaps and flaws in existing theories and debates. In the absence of research paradigms or conventional methods more unusual research methods may be employed. You may have a free reign to challenge theory, but your challenges need to be supported with evidence other than literature.

Remember that at an undergraduate and Masters level you should not be attempting to construct new positions, making a new contribution, developing new explanations or building new theory. Examiners will be wary of claims of new knowledge and instead may suspect that your literature review is inadequate. It is highly unlikely that you are investigating a topic that has never been researched, and even if you are then there will be underpinning theory and discussion.

Task 12. Evaluate the field's maturity

Conduct a brief search for literature discussing the topic. Read each document and make a note of each theory and conceptual discussion you encounter. Look for repeated patterns of discussion, frequently used concepts, theory or debates. Look for patterns of repeated citations – whose work comes up time and time again. Note the various research methods used by authors who have published in conferences and journal papers. Use mind-maps or lists to construct models of what you find. Take the steps mentioned above if you are not finding enough literature.



6.5 Find or define the research problem/s

A *research problem* is the specific problem or issue that is to be investigated. Reading should have uncovered enough about the topic to identify and define the problem that is to be researched. Like reading, finding and defining a research problem is an iterative (or cyclical) exercise. Use the criteria for good topics in section 5.2 and the discussion of purpose in Chapter 2 to review literature with the intention of identifying manageable issues worthy of research:

- Are there key or topical issues facing research or practice?
- Are there gaps or poorly researched areas?
- Are there particular perspectives that interest you?
- Are there opportunities that may be worth pursuing?
- Is there past research that is worth revisiting or updating?

More than one research problem may appear. Compare and evaluate these. Consider how easy it will be to find data, investigate the problem, analyse and interpret it. This may also involve clarifying and even altering the topic that you wish to research. Consider what it is about the topic you wish to research:

- A hypothesis.
- An idea.
- The situation or context.
- A known issue or noticeable problem.
- The underpinning theory.
- Any debate, contradiction or ongoing discussion.

Next, render the 'problem' down into a manageable sentence. Typically this will resemble or even form the title of the dissertation. When phrased differently, the problem becomes the aim of the research project. Using the example in this chapter:

- **Title:** An analysis of the relationship between project team structure and efficiency.
- **Aim:** The aim of this project is to understand and assess the relationship between project team structure and efficiency, with the intention of producing a working model for practitioners to use in the design of team structures.

Research questions may now be derived. Research questions are not the survey questions, they are specific lines of enquiry that the research will try to find an answer for. They may also be rephrased with an outcome focused on research objectives. Using the above example:

- **Question:** What project team structures are present in practice and how may they be classified?
- **Objective:** To explore and define the nature of project team structures by investigating and comparing theory and practice.
- **Objective:** What is project efficiency and how is it managed?
- **Objective:** To explore and define the nature of project efficiency by investigating and comparing theory and practice.

Do not worry if the research problem and questions are not yet crisp and well defined. Typically these will evolve throughout the dissertation process, and may even be fine-tuned once the conclusions are written!

Task 13. Define the problem and questions

Read the literature and examine the models to produce a title, aim and possibly even research questions and objectives. Remember to organise the objectives according to the swim-lanes (section 3.4.1).



6.6 Map the research argument

It has been said that the argument should be a fundamental format for research (Metcalf, 2003). Chapter 3 introduced the concept of the argument, and at this point students should have sufficient understanding of their topic to build a tentative argument.

Some simple pointers may assist in identifying the premises (or series of statements) in the argument:

1. An argument will depend on the start and end points, so try to identify these first.
 - a. Begin with definitions. What do they tell you?
 - b. Do the concepts or relationships suggest any research issues or questions?
 - c. What did the map of the conclusions suggest might be the likeliest outcomes for your research?
2. What does the big picture look like? Are the theories focused, or very broad? Are there many divergent viewpoints, is everyone in agreement, or is there polarisation? The mind-maps will assist here.
3. Is there any vagueness worth considering, or do you avoid it because it is problematic?
4. Are there any obvious contradictions, between authors and in their conclusions?
5. Is there a particular perspective worth exploring?
6. Are there standard arguments that the field employs?

The example of project team structure and efficiency revealed the following:

- Efficiency is difficult to define, and there are different academic opinions. One avenue to explore could be to establish what efficiency means in the context of projects.
- Project teams also appear to be difficult to define, particularly since they are transient. Since a team evolves over time, part of the research should consider how the relationship between the participants changes over the life cycle of a project.
- Most literature sees the term 'project team structure' as referring to the 'matrix organisation'. There are many other forms, such as virtual teams and isomorphic teams. One objective of the research could be to build a universal model of the different forms.
- Team structure is related to leadership, control and decision-making. Does the argument include those concepts, model around these perspectives, or ignore them for the sake of clarity? Only research will determine which the most valid approach is.
- There are an enormous number of factors affecting efficiency. How does this factor into the argument and the research? How can one research real life projects whilst avoiding those factors?

Notice how these in turn suggest research questions that contribute to defining the research problem.

Task 14. Produce a tentative argument map

Use the steps in section 6.6 to start compiling a flow chart of premises.



6.7 Discovering how others have researched the topic

Research in a particular field may be constrained by paradigms, culture and convention. It may not be useful, practical or prudent to use certain methods. Using methods that others have used also provides students with four shortcuts:

- There may be strong justification in the literature for using a particular method.
- The methods themselves may be specified in some detail.
- A list of methods employed can be used to narrow the review of research methods.
- A list of literature used by other authors to inform their research methodology sections.

Most journal articles and conference papers will describe their research method and how the data collection and analysis was conducted. In some cases the authors may even explain why they chose a particular methodology or method. Record the various approaches in a table as these may be used to justify the research choices you make later. You may also discover useful information about sample sizes, scope and types of participants. Use these examples to design your research. You may even choose to confirm the work of others by repeating their research or applying their methods to a different subject or purpose. In such cases you could review the literature with a view to updating the premises underpinning their research arguments.

Task 15. Produce a list of research methods used previously to study the topic

A simple review of the methodology section in conference papers and journal articles will uncover what methods were used and how they were applied.



6.8 In summation

On concluding this chapter students will have read up on their topic and produced maps of the concepts, relationships, key debates and potential conclusions. A tentative argument, title, aims and even objectives will have been compiled, and the student will have a shortlist of research methods used in the field.

6.9 Recommended reading

Northedge, A. (2005) *The Good Study Guide*, Open University Press

Randolph, J. (2009) "A Guide to Writing the Dissertation Literature Review", *Practical Assessment, Research & Evaluation*, Vol. 14 No. 13, online at <http://pareonline.net/getvn.asp?v=14&n=13>

Webster, J and Watson, R.T. (2002) "Analyzing the past to present for the future: writing a literature review," *MIS Quarterly*, (26:2), pp. xiii-xxiii

7 Choose a research strategy

A strategy is generally regarded as a plan of action designed to achieve a particular set of goals. It must be noted that there is some variation in research terminology. Some define 'methodology' as the entire process of how the research is conducted, others describe it as the method used to extract data, and others use it to describe the choice and nature of the data and its analysis (qualitative and quantitative⁷). To resolve this confusion, this guide will regard methodology and research strategy as synonymous.

Planned research is vital. A strategy ensures the researcher is prepared, the subject is studied in the right way, problems are anticipated, the right data is collected, the research activities are efficient, research stays focused and the desired outcomes are achieved. A strategy also forms a key component of your research proposal.

7.1 Terminology

Students often and justifiably feel intimidated and confused by the field of research. It is a broad and vaguely structured subject, with numerous methods, ambiguous definitions and synonymous terminology. Students are advised to acquire the necessary knowledge from prescribed general research textbooks like Bryman and Bell (1999) or Saunders *et al.* (1999). Research methodology and research method will however be defined here since they are specifically referred to.

Goddard and Melville (2007) describe research methodology as a broad range of activities, from identifying the problem to selecting data, designing the research, gathering data, analysis and writing up. Similarly, Buckley *et al.* (1976) define it as "*the strategy or architectural design by which the researcher maps out an approach to problem-finding or problem-solving.*" O'Leary (2004, p.85) defines it as "*the framework associated with a particular paradigmatic assumptions that will be used to conduct your research.*"

O'Leary goes on to clarify the relationship between methodology and other terms saying:

- *Research methodology* focuses specifically on the research project and the particular paradigmatic assumptions used to conduct it.
- *Research method* refers to the specific techniques used to collect data, such as surveys, experiments and observation.
- *Research tools* are devices used to help collect data, such as questionnaires and checklists.

Research methodology will therefore be taken to mean the overall strategy and plan of action for the research project, and research method as the techniques used to collect and analyse data. Other research terminology used here includes phenomena (or perceptible situations and observable events), hypotheses (or untested theory) and research instruments (a synonym for research tools).

⁷ Authors like Bryman and Bell (2003, p.61) treat qualitative and quantitative research as strategies. This guide avoids this terminology in this chapter as it regards these terms as more relevant to data and its treatment.

7.2 Research planning

Research decisions ideally have to take into account the many ‘research assumptions’, factors that involve the researcher, the subject, the project aims, theory, the nature of the data and how that data is to be collected and analysed. The large number of factors will place a burden on students who are looking for an economical strategy to quickly and easily design, research and write up. For most students, research planning becomes a trade-off between thoroughness, accuracy, convenience and speed.

This guide will try to lead you through the planning process by offering four steps:

- Identifying the research scope.
- Choosing a suitable type of research.
- Choosing appropriate research logic.
- Selecting a method from a shortlist (discussed in the next chapter).

Appendix 3 provides a detailed worksheet for making research choices based on the range of assumptions. This consolidates various models of choices that are presented in the following chapters.

7.3 Identify the scope of the research

The scope of your research generically refers to its boundaries, and boundaries may be identified in the amount of data, its availability, ethic issues, theory and even the topic.

Data comes from ‘research subjects’, a collective term for the objects, cases or respondents where data may be derived from, observed or measured. Objects include trees, computers, volcanoes and animals. Cases include organisations, events, projects, people or even the clinical history of a single person. Respondents are typically people who may be surveyed, interviewed or observed.

The number of subjects you can study and how you study them will depend on the topic. A topic like “*Investigating people’s attitudes to health care*” will be generally relevant and there should be few boundaries on the number of potential respondents. On the other hand studying “*The secret life of the Yeti*” might not find any subjects to study.

The number of subjects you can study will also depend on each student’s circumstances. Full-time students will be required to produce a dissertation in a shorter time; they may have no work or practical experience, no access to workplace research and probably have very few industry contacts. Foreign students seldom have local contacts to survey and may have to overcome language and cultural barriers. Part-time students on the other hand may have the benefit of more time to prepare their dissertations, some work experience and industry contacts and a workplace they can research.

Availability of subjects refers to the ease of gathering data from the subjects. This may depend on the topic. The volume of respondents and their likelihood of participating may be high for general business topics like marketing, but minimal for research into rare diseases. Availability may also be affected by types of data. Physical subjects like earth, wind or fire may require expensive instruments and time to investigate. Access to social subjects that involve people or their activities may be limited by the willingness of participants or ethical issues.

Ethical, confidentiality, security, safety and cultural issues may also compromise availability of data. Controversial, inflammatory or intrusive research will generally be blocked by the research committee, but if not it is these issues that can severely limit access to data sources and one’s ability to analyse and write them up.

The scope of the research may be affected by the theory. Are there many viewpoints to investigate, debates and gaps to clarify, or is the field too immature to assist in planning your research?

These issues may be used to determine the scope of the investigation. Any investigation may be described as **wide-and-shallow** with many subjects that provide a simple set of data, or they may be **narrow-and-deep** with only a few subjects that are examined in a lot of detail. For a student dissertation, a survey of 100 workers to identify their computer literacy levels would be regarded as wide-and-shallow. On the other hand an investigation into the leadership practices of 5 project managers would be seen as narrow-and-deep.

Issue	Circumstances	Scope of the investigation
Number of sources	Many	Wide and shallow
	Few	Narrow and deep
Availability of subjects	High	Wide and shallow
	Low	Narrow and deep
Ethical and other issues	Few	Wide and shallow
	Many	Narrow and deep
Topic	General, common issues	Wide and shallow
	Unique, specific	Narrow and deep

Table 6: Determine the scope of the investigation

Task 16. Consider the research scope



What sources are available for the chosen topic?

- If you can think of no data, then now is the time to change the topic!
- Do you have a few cases, or many?
- Can you investigate each case in depth, or only to a limited extent?

If the answers lead to the conclusion that there are few subjects or cases and these may only be investigated shallowly, then reconsider the topic!

7.4 Choose an appropriate form of research

'Form of research' is a broad classification of the manner in which the research will be undertaken. It is also to some extent a description of the purpose of the research.

Choosing the right form is quite important. Some forms may be more suited to the topic than others. The form chosen will affect the structure of the argument and the nature of evidence. It will also affect the literature review, research objectives and questions, research method and treatment of the data. Examiners are also unlikely to be content with purely descriptive research.

The choice of form is tricky. Topic and personal preference will be involved. Some forms require more effort and analytical thinking than others, and some forms may be better suited to a particular scope of investigation than others. It is also important to bear in mind how previous researchers have studied this topic, as discussed in section 6.7. Table 7 below describes nine forms, provides examples of each and makes selection recommendations on the basis of the scope of investigation.

- ① **Useful tip:** Document your reasons for your choices as you go along. These notes will be helpful when it comes to writing up your methodology chapter and explaining your research choices.

Task 17. Tentatively shortlist suitable forms of research

Consider which form/s would be the most efficient, relevant, useful and interesting for the chosen topic. Consider the data implications of each. Refer to section 6.7 and identify the types of research that others have used to study this topic. Keep notes for writing up the research proposal and methodology chapter.



Form		Scope	
Name	Explanation	Wide and shallow	Narrow and deep
Description	This describes subjects, phenomena and situations as they exist, including its components, behaviours and attributes. No attempt is made to explain why the subject is behaving as they do. This form of research answers the questions “What is going on, when did it happen, and who was involved?” An example of an illustrative research aim would be: <i>To describe the migratory behaviour of waterfowl.</i>	√	√
Experimentation	Experimentation involves testing of a hypothesis in a controlled environment, where the number of independent variables and unmanageable conditions can be limited. Ethics regulations also place limits on experimentation by university students. An example would be: <i>To ascertain through experimentation the effects of energy drinks on software developers.</i>	√	
Explanation	A phenomenon, situation or subject’s behaviours are explained, establishing why something has happened or why the subjects behave in the way they do. Explanation requires detailed understanding of the subject and answers the question “Why and how is this happening?” An example would be: <i>To explain the behaviour of project managers in stressful situations.</i>		√
Exploration	A topic area or subject may be explored if the knowledge about the subject is weak, incoherent or the researcher needs to know more. An exploration is characterised by vagueness about the subject or open-minded investigation at the beginning of the research. This form of research answers multiple questions using the seven interrogatives of “What, where, when, which, who, why and how?” An example would be: <i>To explore the popularity of social networking amongst managers.</i>	√	√
Problem solving	Research may aim to solve practical or theoretical problems that the student or others have observed. Here the emphasis is on systematically finding a solution to a specific issue. All seven interrogatives are used. An example would be: <i>To solve project control problems in Agile software development.</i>		√
Proving	Proving an idea, hypothesis or theory involves determining absolutely that it is true or false. This form of research is only partially possible in the study of physical entities, and impossible for the study of social phenomena. Proving and experimentation are related. An example would be: <i>To prove gravity has an effect on crystal growth.</i>	√	
Reflection	Reflection on practice or on an event is a useful mechanism for learning, explaining and improving. Reflection usually offers deep insight into phenomena, but requires perspective and bias to be recognised. An example would be: <i>To reflect on a salesman’s career in information technology.</i>		√
Situational change	Situational change involves changing a situation that the subject or stakeholders find themselves in. These are typically very practical and relevant to a specific organisation or situation. All seven interrogatives are used. An example would be: <i>To improve the retention of staff at XYZ Limited.</i>		√
Testing	Testing is the social research equivalent of proving. Testing involves assessing whether an idea, hypothesis, model or theory is valid. The concept is carefully applied to a situation or situations observed, and the outcomes are carefully analysed to determine whether the concept is suitable, applicable, convincing or compelling. An example would be: <i>To test the hypothesis that productivity declines in the afternoon.</i>	√	√

Table 7. Type of research with scope recommendations

7.5 Choose the research logic

Once the form the research has been chosen, some attention needs to be paid to how the research is to be conducted. Research logic provides an overall structure that answers the question “How do I go about investigating this topic?”

7.5.1 Explaining research logic

Research logic refers to the form of the argument. There are two types. Trochim (2006)⁸ describes these as **deductive** and **inductive**. Deductive research begins with a theory, derives a hypothesis, makes observations to confirm or refute the hypothesis, and that confirmation emerges. Inductive research on the other hand begins with observations, patterns are identified, tentative hypotheses are raised to explain the patterns, and a theory (or tested hypotheses) emerges.

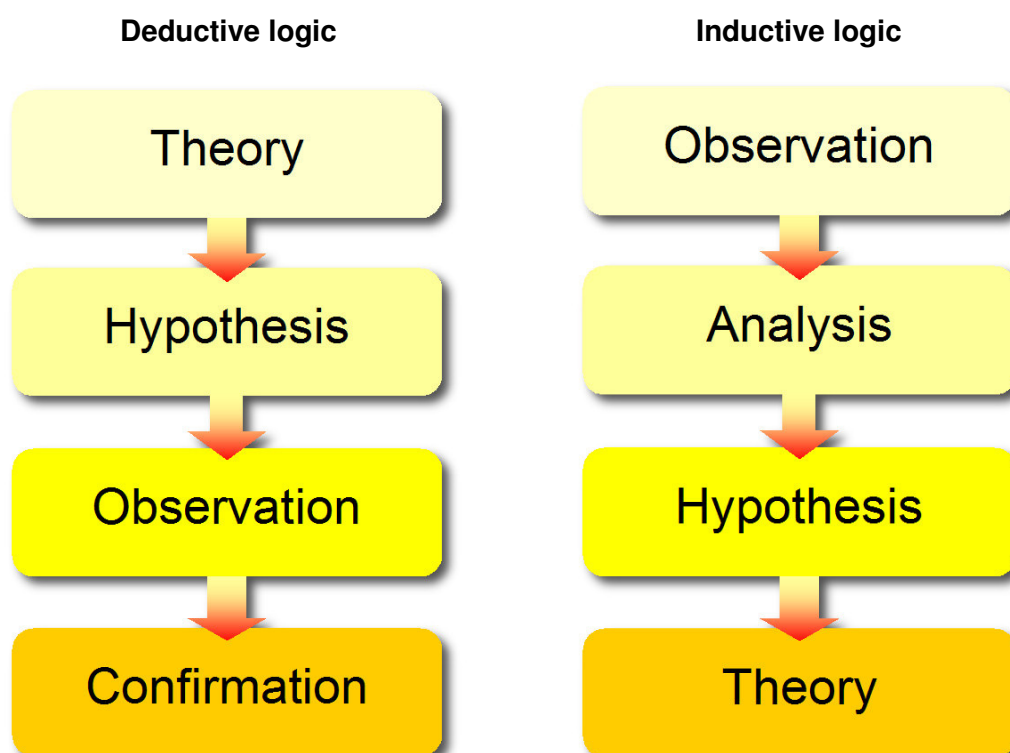


Figure 13: Deductive versus inductive research logic

There are practical implications to choosing between deductive and inductive logic. The topic “Exploring the causes of IT project failure” illustrates these implications:

1. **Deductive logic** proceeds from the general towards the specific:
 - a. Theory: Review relevant literature about project failure in IT to discover:
 - i. Various theories about causes.
 - ii. Various approaches to evaluating IT project performance.
 - iii. Various research methods used to study this topic.
 - b. Hypothesis: Synthesise a hypothetical model from the theory to explain how the subject should behave.
 - c. Observation: Collect data to confirm or refute that hypothetical model through by:
 - i. Testing the model by applying it to a real project⁹, or

⁸ <http://www.socialresearchmethods.net/kb/dedind.php>

⁹ Investigating real world projects to completion usually takes longer than the time available in a dissertation.

- ii. Examining the real world to ascertain whether it supports the model.
2. **Inductive logic** on the other hand proceeds from the specific towards the general:
- a. Observation: Acquire and analyse empirical data:
 - i. Historical project documentation.
 - ii. Reflections on personal experience.
 - iii. Observations of current practice.
 - iv. Observations of behaviours and properties.
 - v. Interviews with participants or experts.
 - b. Analysis: Study this data to look for patterns and descriptions, such as:
 - i. A set of empirically based success factors.
 - ii. Performance criteria that projects may be measured by.
 - iii. Methods suited to measuring performance.
 - c. Hypothesis: Develop general explanations for the situation.
 - d. Produce theory that:
 - i. Is tested by the data.
 - ii. Models the situation.
 - iii. Explains the phenomena.
 - iv. Compares the hypotheses to established theory.
 - v. Explains any discrepancy between literature and this theory.

7.5.2 Which logic?

The choice between deductive and inductive logic can be difficult. Choice involves what can best be described as philosophical and methodological implications.

Most scientific and quasi scientific faculties will lean towards or even demand a deductive approach. This stipulation makes sense when experimentation and the physical world is involved, but may be less valid when social subjects like marketing and management are concerned. From a philosophical standpoint, deductive logic involves observing a situation from a particular theoretical perspective which may not be accurate or may depend on the theoreticians understanding. A major difficulty for theory is that researchers frequently display a different understanding of their subject's environment to the people who live and practice in that environment. Theoretical project management for example is not the same as practical project management.

In the case of the example of "*Exploring the causes of IT project failure*", the student chose inductive logic since he was a practitioner, had experience in this area, and had access to historical data on real projects. This approach allowed him to observe what practitioners close to him were doing from a practitioner perspective. He could adopt the language and characteristics of practitioners, and derive explanations that were important to the practitioners and not to theory. This student was then able to compare the observed behaviour to theory discovered in the literature review, and draw appropriate conclusions based on that comparison.

Had this student been required to choose inductive logic, he would have had to look at the problem from the perspective of past theoreticians who may or may not have understood the nature of practice. He would also have had to use the language of the theory, which was different to that used by practitioners. By choosing inductive logic, the result was far richer and more relevant to his practitioner background, and led to a far better understanding of the subtleties of the organisation and its development practices.

7.5.3 Logic and scope choices

The choice of logic may be indicated by research scope, as shown in Table 8. Ignoring other factors, deductive research proceeds from the general towards the specific and evaluating a small sample can lead to poor generalisation and questions of validity. Deductive logic depends on a representative sample, control over the variables and a shallow examination of relatively simple situations. On the other hand, deep investigation into a relatively small number of cases is more suited to inductive investigation.

Scope	Deductive	Inductive
Wide-and-shallow	√	
Narrow-and-deep		√

Table 8: Choice of logic based on scope

7.5.4 Choices based on logic and research form

Which form of logic works best with each form of research? Deductive research imposes externally derived understanding and hypotheses on the observation of a subject, and researchers try to confirm what they already have proposed should be these. Inductive research on the other hand supports exploration and allows new knowledge and understanding to emerge from the subjects.

Table 9 makes general recommendations about what logic to choose. Note the correlation with scope, taken from Tables 6 and 8.

Form	Logic		Scope	
	Deductive	Inductive	Wide and shallow	Narrow and deep
Description	√	√	√	√
Experimentation	√		√	
Explanation		√		√
Exploration		√	√	√
Problem solving		√		√
Proving	√		√	
Reflection		√		√
Situational change		√		√
Testing	√		√	√

Table 9. Choice of logic based on form of research

Task 18. Tentatively choose your research logic



Consider how others have researched the topic. Is there a clear preference for deductive or inductive logic? What was the scope of their research? Consider whether deductive or inductive research is the most appropriate for the chosen topic, scope and type of investigation. Finally, consider how the more suitable form of logic could be implemented. Record these deliberations; they will be used to write up the research chapter.

7.6 Recommended reading

Collis, J. and Hussey, R. (2009) *Business Research*, Palgrave Macmillan

Cropley, D.H. and Harris, M.B. "Too Hard, Too Soft, Just Right ... Goldilocks and Three Research Paradigms in SE", *Managing Complexity and Change, INCOSE 2004*, 14th Annual International Symposium Proceedings

Trochim, M.K. (2006) Deductive and Inductive Thinking, *Research Methods Knowledge Base*, available online at <http://www.socialresearchmethods.net/kb/>

8 Choose a research method

A research method is a specific process used to undertake the investigation, and includes data selection, collection and analysis. Selecting the right method is a complex activity as there are a lot of factors to consider. Understanding the choices is not made easy by the sometimes obscure language used by the research community and philosophical debates raging in the background. To quote the Wikipedia on this issue:

“In most physical and biological sciences, the use of either quantitative or qualitative methods is uncontroversial, and each is used when appropriate. In the social sciences, particularly in sociology, social anthropology and psychology, the use of one or other type of method has become a matter of controversy and even ideology.”

This section is not a replacement for detailed discussion in a good textbook. It will instead recommend a range of methods, describe criteria based selection, offer recommendations based on student circumstances, provide examples, and discuss validity a bit further.

8.1 A range of common and useful research methods

Nine methods have been found by the author to be particularly useful to dissertation research. There are of course far more, but these tend to be frequently used, well documented, suited to intensive investigation, are suited to researching real world problems, and require only average skills and don't demand lots of experience.

8.1.1 Action research

Action research is an approach that allows the researcher to simultaneously solve a real world problem and create knowledge (McNiff and Whitehead, 2006). It is more a methodology than a method, an overall approach that may employ different methods to construct solutions and research a subject.

Action research is an iterative, critical and reflective process. The researcher will plan a step, review literature, design a solution, implement that solution in the real world, monitor execution, reflect on the outcomes, write up and then plan the next step accordingly. Each step's activities will be informed by theory and analysed in a rigorous manner. The success of the research may be measured in terms of the situational improvements, the quality of the research, and the quality of the knowledge produced.

Action research is suitable where the researcher is a practitioner, wishes to make a situational improvement or undertake a project as part of their research, and who have the ability to adopt an emic (insider) role. Action research involves flexibility, where the final solution is unknown at project inception, and methods and outcomes may evolve through the course of the project. Supervisors and examiners will recognise that situational improvement may be beyond the control of the student researcher. Students should only consider this method if the project begins and ends within the time allocated to research a dissertation and if the project has a good chance of being completed.

8.1.2 Case study method

According to Yin (1984, p.23), the case study research method is “... an empirical enquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used.”

In applying the case study method the researcher analyses and interprets a situation loosely, asks probing and analytical questions and builds a deep picture. New evidence can prompt new questions and new insights. The case is then written up in a narrative format so as to provide

the reader with information about the context, phenomena or problems, components and dynamics. The product is a 'theory' that explains the phenomenon.

The case study method is used to build an understanding of the "what" and "why" or to explore a situation. Tellis (1997a) distinguishes between descriptive cases, explanatory cases and exploratory cases. According to Kohn (1997), the case study method is particularly suited to situations where little theory is available, where measurement is difficult, or where situations are complex. It is an effective tool for exploring complicated and unclear causal relationships, and Yin (1984) finds it useful in examining contemporary events. The case study method is suited to an emic (insider) research role but can be used from an etic (outsider) perspective. Sufficient data has to be available to build up a satisfactory picture of the context, and detailed data is needed to explore or explain particular phenomena or problems in question.

One criticism of the case study method is the small number of cases do not provide for reliability or generalisability. Another complaint is that researcher bias is prone to affect the interpretation and findings. These possible weaknesses also point to case study strengths. Detailed and close investigation allows the researcher to understand the situation. Because the research is not necessarily tied to a hypothesis the researcher can encounter and explore phenomena and discover unpredicted explanations. Multiple sources and multiple techniques can be used to collect evidence, so researchers should ensure the study is well constructed and data collection is comprehensive and systemic.

The case study method has been used to study why projects fail, understanding knowledge management in organisations, practices in large construction organisations, information systems implementation and agricultural economics. Students selecting this method are advised to read Yin (2007), Tellis (1997a), Tellis (1997b) or Gomm *et al.* (2007).

8.1.3 Content analysis method

Content analysis is a method used to analyse the presence of words or concepts in written evidence. It can be applied to any form of document and be used to study any subject where written text is available as primary evidence.

There are two forms of content analysis; conceptual and relational. Conceptual analysis examines frequency and nature of particular concepts with the help of descriptive statistics. Relational analysis examines the relationships between two or more concepts, potentially using differential statistics. Some examples include studies of online communications, health care, social work, performance management and job opportunities.

Citation analysis is a specialisation of content analysis that has been used to evaluate research and its importance. Analysing the frequency, distribution and trends in citations is limited in its applications and findings but it can produce interesting and important findings. A good example is Loebbecke *et al.* (2007).

The basic steps to conducting a content analysis are:

- Identify the question/s the analysis will answer.
- Select a representative sample of texts.
- Scan each text for words or concepts.
- Code, or record, the occurrences.
- Perform statistical analysis.
- Prepare a theory or model of the analysis findings.

Mayring (2000) and Neuendorf (2002) offer flowcharts to describe the content analysis research process. Neuendorf's approach shows more emphasis on validity of findings and rigour of the coding process than the above steps. Further quantification of the process leads towards machine extraction of ontologies, a technology used in building dictionaries and classification

mechanisms for knowledge bases and portals. On the other hand a greater emphasis on analysis of concepts (rather than words) leads to the technique of conceptual mapping.

Content analysis is suitable when extensive documentary evidence is available, such as online forums and published literature. It may also be used in conjunction with the case study method to analyse specific problems or questions.

8.1.4 Critical reflection

Clark (2008) regards Dewey (1933) as the modern originator of the critical reflection, and it is one of the few formal ways to research personal experience.

This method involves critical analysis of a situation that the researcher has been a part of. This requires the analysis of their assumptions, examining the situation's context, imagining alternative outcomes, studying the events from multiple perspectives, and questioning their role and that of others. Critical reflection is quite different from other methods in its approach to evidence in that this evidence may be quite tacit, or held in the researcher's (or participant's) head/s. In some cases the researcher is encouraged to then reject this available evidence in order to "*establish the truth or viability of a proposition or action*" (Clark, 2008). Reflection may occur during, immediately after or a long period after the event (Liston and Zeichner, 1996).

Critical reflection is used to explain a situation and to imagine alternative outcomes that may have been possible. It is a learning tool and is suited to research where evidence is anecdotal or tacitly held. It also can underpin industry techniques like the post project review of the COLA methodology (Orange, Cushman and Burke, 1999). Researchers should be aware of the challenges to the validity of any study based on reflection, and should take care to support their empirical data with theory and secondary data wherever possible.

8.1.5 The Delphi method

Murray and Hammons (1995) regard the Delphi technique as being characterised by anonymous group response, several rounds of questionnaires or interviews, researcher controlled feedback and statistical responses, and eventual presentation of statistical group responses. The Delphi technique is a useful and valid option for students who:

- Do not wish to send out a weak survey.
- Wish to learn about a subject in more depth and through the eyes of experts.
- Do not have access to a large number of respondents.
- Have access to a few experts, and there are plenty of those in UK universities!
- Wish to build up their profiles within a group or gauge the response to a new idea.

Linstone and Turoff (2002) provide a comprehensive resource on this method¹⁰. Skulmoski *et al.* (2007)¹¹ recommend the method for postgraduate research and provide useful flowcharts and a set of examples of dissertation research. Applications include:

- Identifying critical success factors for ERP projects.
- Developing a model of technology evolution.
- Improving IT security audit quality.
- Identifying the criteria for measuring knowledge management efforts.
- Identifying reasons for Defence Department IT project strategy performance.
- Identifying emerging IT issues that affect public school board policies.

¹⁰ Available online at <http://is.njit.edu/pubs/delphibook/delphibook.pdf>

¹¹ Available online at <http://jite.org/documents/Vol6/JITEv6p001-021Skulmoski212.pdf>

8.1.6 Document analysis method

Document analysis is similar to content analysis in that both study written texts. Whilst content analysis looks at frequency and patterns of words or concepts with each text, document analysis focuses on the text as a whole.

Document analysis is essentially a critical evaluation of a document and could be used to perform a rigorous literature review. It asks what the document is about, its main arguments, the evidence to support those arguments, the writer's authority and bias, values reflected, the format and presentation of the document, the intended audience, and the purpose and agenda behind the document.

Researchers choosing this technique should take care not to be limited to drawing overly general conclusions on the basis of a small or incomplete sample. Researchers should also try not to interpret the writer's intent and values too much.

8.1.7 Grounded theory method

Grounded theory was first proposed by Glaser and Strauss in 1967, and has subsequently evolved into two different approaches (Bryant, 2009; Onions, 2006). It is an interpretive and investigatory technique that allows theory to emerge from the data as analysis takes place, rather than starting with a hypothesis that the researcher wishes to test. This is termed *tabula rasa*, or beginning one's research with a clear mind.

The general grounded theory process is described in Figure 14. Grounded theory is a rigorous and complex process, involving coding (similar to content analysis) and iterative construction of theories through the use of categories and memos. Describing its processes in detail is beyond this paper. Recommended reading includes Charmaz (2006) who provides a readable and informative introduction and Charmaz and Bryant (2009).

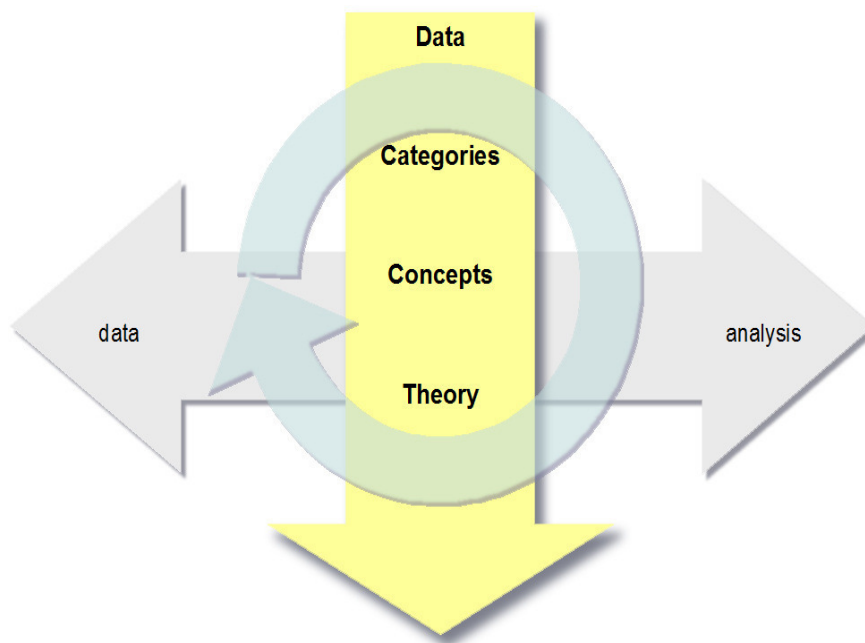


Figure 14. Iteration in Grounded Theory (and other inductive approaches)

Grounded theory has been used to research subjects like health care, psychology, information systems, knowledge management, entrepreneurship and process engineering. It is suited to complex situations that involve people and events, and is suited to research of unfamiliar or disputed territory. The method should only be tackled by skilled and confident researchers.

8.1.8 Structured observation

Structured observation is a planned and methodical study typically carried out by an independent observer. Structured observation is treated as a method rather than as a data collection technique since it involves careful research design and execution. It is relatively easy to conduct and is suited to student research where the researcher is passive and a number of subjects can be observed ideally without disruption. The quality of the observations will be determined by the insight or familiarity that the observer has of the subject, and by the quality of the observation guide. The process involves the following steps:

- Determine what is to be observed.
- Identify a suitable data sample.
- Choose the observers.
- Develop observation guides.
- Select or design the setting for the observations.
- Pilot the study to train observers, test observation guides and evaluate data produced.
- Conduct the observations.

This is a practical technique that may be applied to a range of subjects and for a variety of purposes, such as animal husbandry, business, drug trials, education and information technology. Bryman and Bell (2003, pp. 175-192) provide more detail.

8.1.9 Survey method

The survey is possibly the most commonly used technique in management and social research. It is being described here as a method rather than as a technique because it can refer to a range of data collection activities as well as the design of the survey and analysis of that data.

This section will not describe the method because there is a vast quantity of literature available and most research modules will cover it (and sometimes no other!) Instead, it may be more beneficial to warn students against choosing this method. The construction and application of a good survey is surprisingly difficult. Surveys are unfortunately also overused, poorly applied and unsuited to many dissertations. A survey is suitable when:

- The situation is not complex or variables can be identified or controlled.
- Simple responses are required.
- Data is quantitative or structured.
- Data collection is simple and mechanical.
- Little skill on the part of the surveyor is required. It is recommended that other techniques are used when the 'survey' is more like an interview.
- Large numbers of respondents are available (a representative sample).
- A high rate of non-responses is acceptable.
- Missing data can be managed and is not crucial.

A few words of caution should also be uttered:

- Surveys are NOT suitable for detailed investigation of complex phenomena.
- It is not acceptable to rely on 10 survey questions or less, often the limit offered by online services like Survey Monkey!
- Do not ask questions that will not be analysed and reported on.
- Don't ask for demographic detail if it has no bearing on the research.
- Students should be wary of making exaggerated claims based on statistical analysis.
- Basic descriptive statistics are not sufficient to prove causality.
- Inferential statistics are required at Masters level and suggested for undergraduates.

Bryman and Bell (2003, p.176) discuss further issues and offer structured observation as a more suitable alternative for studying behaviour. Surveys have their place, but students should be made keenly aware of their limitations and realise that they are not the 'easy' option! Tutors should try a little variety and ensure their students' choices are determined by factors like topic and data.

Task 19. Review the short-listed research methods

Review the descriptions of the methods. Compare their strengths and weaknesses, and consider which will be the most suitable for your research project.



8.2 Factors affecting the choice of method

Many factors may impact on the choice of research method. In addition to the factors affecting choice of research strategy, this section will explain the factors most relevant to methods and describe a selection mechanism. What can affect the choice of method?

- **The data:** The data collected for a study of microprocessor performance will be very different to that collected in a study of resident's reactions to their council increasing the tax rate. This choice will be discussed further in Chapter 12.
- **Subject relationship:** Researchers who have an intimate or insider relationship (termed *emic*) with the subject have potentially greater access to data, greater knowledge of the context and more ability to observe and understand the nuances of behaviour. In other words they can delve deeper into situations and develop richer interpretation. Outsiders (or *etic* researchers) on the other hand have less access to this type of knowledge but are more likely to be independent.
- **Research skills:** Experienced researchers may choose to reuse methods they are familiar with, may use more complicated and powerful methods, or they may try experimental options. Some methods require greater proficiency than others.
- **Context dependency:** Certain phenomena will occur and behave irrespective of their environment. On the other hand, phenomena may be completely reliant on their surroundings or circumstances.
- **Situation complexity:** Related to both context and type of data (qualitative or quantitative) is the issue of complexity. Complex subjects tend to require deep investigation or the taking into account of a large number of variables.
- **Data analysis:** Numerical and structured data may be analysed using quantitative techniques like statistics. Narrative or 'soft' data like discussions and cases that are not comprised of numeric data may be analysed using qualitative techniques like coding.

8.3 Research method selection

The above criteria are added to those from the previous chapter to develop the selection model shown in Table 10 below. Ticks represent the most common or most appropriate options.

Criteria	Option	Action research	Case study	Content analysis	Critical reflection	Delphi	Document analysis	Experimentation	Grounded theory	Structured observation	Survey
Scope of research	Wide and shallow			√			√	√		√	√
	Narrow and deep	√	√		√	√			√		
Form of research	Description	√	√	√	√	√	√	√	√	√	√
	Experimentation							√		√	
	Explanation		√		√	√		√	√	√	√
	Exploration		√	√		√	√		√	√	
	Problem solving	√	√			√			√		
	Proving			√				√			
	Reflection	√	√		√				√		
	Situational change	√			√				√		
	Testing			√		√		√		√	√
Logic	Deductive			√	√	√	√	√		√	√
	Inductive	√	√		√	√			√		
Relationship with subject	Emic, insider	√	√		√				√	√	
	Etic, outsider		√	√		√	√	√	√	√	√
Research skills required	High	√							√		√
	Low		√	√	√	√	√	√		√	
Context dependence	High, influential context	√	√	√	√	√			√	√	
	Low influence			√			√	√		√	√
Situation complexity	Complex, many variables	√	√		√	√			√	√	
	Simple, few variables			√			√	√		√	√
Nature of analysis	Quantitative			√			√	√		√	√
	Qualitative	√	√	√	√	√			√	√	
TOTAL (add up all highlighted ticks)											

Table 10: Criteria based research method selection model

The example of the topic “*To explore the causes of IT project failure*” chosen by a student who was a practitioner studying projects at work will be used to illustrate the use of this model. Highlight the most relevant options (rows) for each criterion. Now count the number of highlighted ticks in each column and record the total in the last row. In this example the case study, critical reflection, Delphi and grounded theory methods were found to be the most suitable. Note the multiple ‘forms of research’ chosen indicate that all these forms were relevant. The student in this case eventually chose the case study method.

Criteria	Option	Action research	Case study	Content analysis	Critical reflection	Delphi	Document analysis	Experimentation	Grounded theory	Structured observation	Survey
Scope of research	Wide and shallow			√			√	√		√	√
	Narrow and deep	√	√		√	√			√		
Form of research	Description	√	√	√	√	√	√	√	√	√	√
	Experimentation							√		√	
	Explanation		√		√	√		√	√	√	√
	Exploration		√	√		√	√		√	√	
	Problem solving	√	√			√			√		
	Proving			√				√			
	Reflection	√	√		√				√		
	Situational change	√			√				√		
	Testing			√		√		√		√	√
Logic	Deductive			√	√	√	√	√		√	√
	Inductive	√	√		√	√			√		
Relationship with subject	Emic, insider	√	√		√					√	
	Etic, outsider		√	√		√	√	√	√	√	√
Research skills required	High	√							√		√
	Low		√	√	√	√	√	√		√	
Context dependence	High, influential context	√	√	√	√	√			√	√	
	Low influence			√			√	√		√	√
Situation complexity	Complex, many variables	√	√		√	√			√	√	
	Simple, few variables			√			√	√		√	√
Nature of analysis	Quantitative			√			√	√		√	√
	Qualitative	√	√	√	√	√			√	√	
TOTAL (add up all highlighted ticks)		7	10	4	9	8	2	2	8	7	1

Table 11: A scored method selection example

Task 20. Shortlist the most suitable research methods

Use the criteria based research method selection model to identify and list research methods and rank them in order of suitability. Remember, caution and common sense should be exercised with any tool like this! Compare your thoughts from Task 19 with your findings here.



8.4 Selection based on student circumstances

Choices may also be affected by a student's own circumstances. The student's relationship with their subject and their research skills are covered to some degree in the model described in the previous section. Experience suggests three further circumstances frequently have an impact on the student's ability to research their topic. The suggestions provided here are intended to inspire ideas, help refine topics and to be used to confirm or clarify the choice of a research method.

8.4.1 Students with limited access to data

Limited access to data means students are not able to find enough of the right subjects, make adequate observations or persuade their subjects to respond. In these cases a wide-and-shallow approach and broad generalisations are not possible and students should aim for a narrow-and-deep approach that allows them to maximise their limited opportunities. The following suggestions have been recommended to students with limited access to data:

Suggestion 1: Improve your introductory letter and the 'selling' of your survey.

A poor letter introducing your research and asking people to fill in your survey practically guarantees no one will respond. Choose your sample carefully, be polite, be clear and succinct, be trustworthy, and write well. If your language is not good then employ someone to help you write a good introduction. Give potential participants a reason to respond, such as a view of the findings once the project is complete or a draw for a prize. Finally it is vital that your survey is designed well, the questions are of top quality, and you are properly investigating the subject. Ten weak questions on Survey Monkey will not inspire confidence. Why should people respond if you can't be bothered?

Suggestion 2: Study those subjects working and studying at the university.

Universities typically employ and teach tens of thousands of people. All will be aware at some level of what research is about and most are usually willing to participate in the odd study.

The Delphi method, grounded theory and surveys may be used to engage with a sample of academic staff. Delphi methods are particularly effective as the panel members will be recognised experts or tutors in the subject and can contribute very useful views and even literature suggestions to the novice researcher.

Surveys are a particularly common means of researching other students, but probably the most abused and least explanatory. There are a wide variety of students on campus and it can be difficult to nail down the details sufficiently. It may be more useful to target specific groups, or engage with part-time students who are working professionals. Other methods may be used to take into account the nature of student subjects and these include critical reflection and structured observation. In rare and now possibly unethical cases, students have even been experimented on.

Case studies may be drawn from university projects that tutors and supervisors have been involved in. Universities regularly engage in research projects, build new facilities or even change departments around. Academic staff may also be involved in projects as external consultants. Ask your supervisor or tutor whether there are any projects that would be relevant to your research.

Suggestion 3: Research one or two cases in great detail.

If students are able to persuade an organisation, group or project to participate in their research, it is possible to use case study methods, action research, or structured observation to investigate a single case in sufficient detail.

This type of research requires extensive access to that one subject. Students may ask family, friends, tutors, professional bodies, Chambers of Commerce or government development

agencies for assistance in locating a suitable subject. You will then have to approach the management with a clear and professional proposal that explains what you wish to do, why, how, when and what the benefits will be to them and to yourself. Students may offer free services to the organisation, but be aware that the research will take time and you cannot afford to prioritise work over research.

Suggestion 4: Research the body of literature.

Students may perform rigorous analysis on the body of knowledge relevant to their course and career. This leads to deep insight about what research is being conducted in the area, how it is being researched, who is doing it, trends and so on. This is not a literature review; it is a methodical document or content analysis to extract meaningful and typically quantitative data. Analysis can produce information and conclusions that are useful and interesting to most academics in the field.

Published examples include the evolution of project management research (Turner, 2010, in the International Journal of Project Management), a citations analysis examining research importance in information systems (Loebbecke *et al.*, 2007) and an analysis of knowledge management literature and ranking of its journals (Serenko and Bontis, 2009 and 2010).

Suggestion 5: Research of student research.

Student research may be studied in the same way that the general body of literature may be examined. Student research presents a researchable opportunity if sufficient dissertations can be obtained. Content and document analysis may be used to identify what previous students have investigated, literature referenced, methods used, conclusions and other trends and phenomena. Data may be statistically analysed, contrasted with published research or even subjected to a Delphi panel for comment.

An illustrative example would be “*Most successful Masters research over the last ten years at the Faculty of Business.*”

Suggestion 6: Internet forum research.

The jury is still out as to whether data gathered from Internet forums is of sufficient quality to base university research upon. Forums do provide access to a target group of people, it is usually acceptable to post a questionnaire online or discuss topics online, and may be possible to properly qualify and even interview respondents. On the other hand you will need to bear in mind that people from all over the world use forums, the prevailing forum ‘culture’ will bias results, and there are many reasons why people participate in forums the way they do.

One example is that of a PhD student who used Internet forums to identify people to evaluate his software methodology. His respondents completed a questionnaire after using the technology he had developed and these answers contributed to the evaluation of his hypothesis that was embodied in the technology.

If this is a desirable source of data then it is recommended that you select the forums carefully, join the forums early and participate in them to build up your credibility since people will be suspicious of someone looking for information on the day they join. You should clearly establish the limitations of such a study and look for ways to improve the validity of your research.

8.4.2 Suggestions for international students

Suggestions for international students are based on three general assumptions; their language skills are weak, they are not able to work full time due to visa restrictions, and they have few or no local industry or family contacts who may assist in finding or being subjects.

Suggestion 1: Internet forum research.

This option, discussed above, allows the student to locate a larger number of respondents than they would normally have access to. Forums with a global membership may assist in

overcoming language barriers, people tend to be more tolerant of people like themselves, and language specific forums may help avoid language issues entirely.

Suggestion 2: Cases 'back home'.

Although research may be a useful way of building a reputation in the country you are studying in and possibly intend on immigrating to, it may also be useful to build your reputation back in your home country. Students with connections may consider persuading them to locate subjects who are amenable to long distance research.

The method used will depend on each student's circumstances. Case studies and critical reflection will be a good choice if the student was previously employed and has access to a large amount of data and insights. If the student is able to pay a visit to sites or organisations back home (at their own expense), then case studies, the Delphi technique or structured observation may be useful options. A long distance survey may be suitable if students are not able to return for a research visit but are able to reach subjects via telephone or email.

There are difficulties. Supervisors and examiners need to be persuaded that the subjects exist and that the data is valid and not 'cooked'. Ethics committees will worry about a range of issues, and there will be concerns about the costs involved which will have to be borne in their entirety by the student.

This type of research is common due to the large numbers of international students in universities around the world. Some examples include a grounded theory investigation into banking technology in Bangladesh, project practices in Morocco, investigating use of construction methodologies in China, and causes of project failure in Nigeria.

Suggestion 3: International comparisons.

International students are in an advantageous position in being able to compare home practice to research and practice in the country in which they are studying. As discussed in the previous section, data must be available to support the study. Another option is to research the challenges they face as they try to study and become professionals in a new country.

Examples encountered include: a comparison of building practices in the UK and China, the challenges facing foreign project managers, and a comparison of UK theory to Greek project practice.

Suggestion 4: Multi-cultural and multi-lingual issues.

International students may be more familiar with the issues facing organisations and practices that transcend national, cultural and language boundaries and time zones. This familiarity gives them a particular sensitivity towards the nuances and problems involved.

8.4.3 Suggestions for students with work experience

The following five strategies illustrate the choices recommended to students wishing to utilise their work experience in their research. Choices will be based primarily on the quality of researchable data and on the nature of the research problem. Each strategy will have different implementation, methodological and methodical implications, and these are discussed briefly.

Suggestion 1: Just proposing a set of research questions.

Mature and gap-year students often encounter interesting and researchable problems or phenomena during the course of their employment.

This strategy simply aims to identify a dissertation topic and/or set of research questions from the work experience. Students may reflect to a limited extent on their experience to identify issues that affected practice and describe a general context in the introductory chapters. The literature review will then study the problem from a theoretical perspective, and any conclusions and practical recommendations will be general rather than specific to the original case.

This strategy is suitable where the data from the work experience is barely researchable, where there are ethical or confidentiality complications, or where the student wishes to examine the problem from a theoretical perspective. Choice of methodology and method will not be influenced by this strategy. Illustrative examples taken from recent dissertations include: adoption of project management in Nigeria, construction procurement practices in the UK, use of value management in the charity industry, and the failure of information systems development in small and medium enterprises.

Suggestion 2: Providing illustrative insights.

Work experience can be used to illustrate the application of a theory in practice, to inform arguments and to help explain complex concepts. Illustrative insights may be used where a non-critical review of theory will be too perfunctory, where the literature review does not meet the assessment requirements to be 'critical', or when it is necessary to show the student understands the theory.

Insights, anecdotes or observations may be regarded as very weak evidence or even unsubstantiated opinion. In order to overcome the criticisms students should document their expertise in introductory chapters so as to establish why their insights are valid and relevant. Students should ensure the insights have been derived from situations that are similar or relevant to the theory, argument or situation being illustrated. The insights should then be treated rigorously by being broken down and critically analysed or even critically evaluated.

This strategy is more appropriate when the student has extensive experience but where that experience is not researchable or weakly relevant or where the student does not wish to research the topic that would be more relevant to that work experience. There will be few (if any) methodical implications to adopting this strategy because the illustrations are not to be used to substantiate the argument.

Suggestion 3: Investigating a phenomenon.

The workplace is a good source of interesting and relevant phenomena, and investigating them is particularly appropriate for fields of study like management that are practice-based and where the theory is arguably focused on people and problem-solving.

Investigating phenomena can be approached using inductive research, where a theory or explanation is derived from observations. These investigations can take the form of describing or explaining. Describing requires detailed and accurate analysis of the situation; identifying the what, where and when of is happening, who is involved and how the situation arose. Explanation involves describing the situation, identifying why it happened and perhaps making judgements.

Work experience contributes the research problem, context, research data and insights useful for illustration and interpretation. Introductory chapters will present the background to inform the reader and establish the relevance of the research. Empirical analysis would then use a suitable method to gather data from the work experience and analyse it. Generalisation of conclusions and recommendations would then be limited to the organisation/s that data were drawn from and to similar phenomena in a similar context. Organisations are highly complex, and it is generally not possible to generalise findings from one case study to another organisation unless practically all the variables / conditions are the same.

This strategy is appropriate where a lot of researchable data is available and the experience is relevant. Broader or deeper investigations are both possible, depending on the number of cases and on the generalisations the researcher wishes to make, but this type of investigation is more suited to a narrow-and-deep scope of research.

Suggestion 4: Comparing theory to practice.

Theory and practice diverge in a number of ways and for different reasons. Smith (2006) notes performing contradictions and a mismatch between theory and empirical evidence. Theory

focuses on knowledge creation whilst practice is concerned with knowledge application, knowledge exploitation and implementation. Truch *et al.* (2000) observe three different groups (academics, consultants and business) and that they have different agendas and different understandings of the fundamental concepts.

Research that compares theory to practice can highlight and bridge any gaps between these worlds.

“The academic literature is full of advice and descriptions of the advantages to be gained from emphasizing knowledge while practitioners’ accounts alternatively reflect excitement and frustration at the costs and time taken to realize benefits. The two groups are often not quite in agreement about which are the most pressing problems and the order in which they need to be tackled.” (Jacob and Ebrahimpur, 2001)

Comparison is suitable when there is researchable data, where there are obvious or important differences between what the student has experienced and been taught, the student possesses good skills in critical analysis and evaluation, and where the limitations are acceptable.

Students can productively compare the generalisation of theory with the specialisation of practice. Theory and cases need to be chosen carefully to ensure they cover the same subject areas. The background of each case should be described carefully so as to establish relevance and validity. Theory should then be modelled by identifying and critically evaluating key theories, concepts, entities and their relationships. Practice phenomena should then be investigated and critically evaluated in terms of theory. The differences will be identified and explained in findings and conclusions. This approach may also produce recommendations for practice or for theory. Limitations should be treated carefully and broad generalisations and recommendations should be avoided.

Examples include: a comparison of UK project management theory to Greek practice, and a comparison of IT systems development theory to practice in a Yorkshire bank.

Suggestion 5: Solving a problem.

Practitioners implement knowledge and solve problems. Research can be used as an interactive tool to find solutions and evaluate their performance.

This approach involves situational improvement whilst developing and testing practical knowledge and maybe even theory. Problem solving is typically undertaken using an action research methodology. Problem definition, solution identification, implementation and assessment are iteratively executed until the project is completed or problem is solved. The literature review will focus on identifying solutions, findings will assess performance of what was developed, and conclusions will present recommendations to practice.

Students considering this strategy will require a single suitable case, be able to lead the change in practice, be able to integrate the work with the research and complete the project within the timeframes of the dissertation. This Approach will have ethical considerations and risks like responsibility for project failure will have to be managed.

Suggestion 6: Proving a theory.

Writing a dissertation will be a unique experience for most students. Some students use the opportunity to study a subject that has interested them, research and prove a hypothesis, or prepare for a new career. In a few cases, students have used the time to investigate, design and even develop an idea they acquired whilst at work.

Proving a theory involves deductive research logic in defining the problem, formulating a hypothesis, testing the hypothesis and making generalisations on the basis of findings. ‘Proof’ has a formal meaning and in most cases it is only possible to indicate the likelihood of a hypothesis being true or false.

This approach should only be used where it is possible to be sure about the nature of the phenomenon, where the relationship between cause and effect can be determined with a high degree of certainty, and where the context can be strictly controlled. This approach may therefore be more suited to experiments and development of systems where the system is evidence or proof that the underlying hypotheses are true.

Task 21. Review your circumstances

Do any of these circumstances apply to you, and does this affect your choice of research method?



Are you ready to finalise your choice of research method yet? Does this confirm your topic? If not it may help to take your shortlist and list of reasons for preferring each one to your tutor or supervisor and discuss the choice with them.

8.5 Research quality and issues of validity

Trochim (2004) said “*Validity is the best available approximation to the truth of a given proposition, inference, or conclusion*”. He goes on to say “*The theory of validity and the many lists of specific threats provide a useful scheme for assessing the quality of research conclusions*”. Validity is an essential quality of arguments and research.

Some examiners consider the validity when grading dissertations but others do not. A major shortcoming of the marking sheets in Appendix 1 is that they do not require the examiner to evaluate validity. Nevertheless, students are however expected to pay attention to this concept in two ways:

- Ensure their arguments are valid.
- Ensure their research is valid, as discussed in this section.
- Critically evaluate their own research when writing up their conclusion.

Validity is a not cut-and-dried notion. Winter (2000) feels that validity is not a fixed concept, being conditional on the research methods adopted and being concerned with whether the researcher has measured what they intended to and whether the information captured about phenomena is appropriate.

Validity is multi-faceted and difficult to quantify. Terms frequently encountered in literature include conclusion, internal, construct, external, and the less frequently occurring measures of face, content, criterion, predictive, concurrent and logical validity. The following table combines practical concepts from Charmaz (2006, pp.182-183) with a modification of Guba and Lincoln (1985) by Bryman and Bell (2003) to produce a pragmatic set of basic validity criteria for dissertation students. Students are advised to read about the specific issues of validity that apply to the method they have chosen, and review Table 12.

Criteria	Explanation	Application suggestions
Construct validity	Does this research measure what it was intended to measure?	- Review your method and data in terms of your aims and objectives. - Ask yourself "Will this answer the question?"
Significance	How likely is it that the findings are due to chance? Did the independent variable produce the observed effect (internal validity)?	- Carefully analyse the phenomena and ensure all the relevant variables and relationships have been identified. - Critically evaluate the hypotheses to ensure they correspond with the variables.
	How important are the findings?	- Compare theory to the research, looking for gaps and unresolved debate. - Examine the practical aspects of the research.
Generalisation	How representative is your sample or experiment of the real world (external validity)?	- Use statistical functions to support sampling. - Critically review your understanding of the population. - Ensure the sample is large enough to support your analysis and conclusions.
Credibility	Ensuring that the research is believable and accurately reflects what it is investigating.	- Select representative data. - Design instruments to collect relevant data. - Develop familiarity with the subject. - Increase the range and depth of observations. - Check logic, causality and the truth of evidence for conclusions. - Ensure there is sufficient evidence and argument for the reader to arrive at the same conclusion.
Transferability	Can the research be applied to other contexts, as implied by the generalisations?	- Do not make unsubstantiated or untested claims. - Ensure that generalisations are substantiated.
Reliability	Is the research dependable and does it inspire confidence in the outcomes? Can another researcher reproduce your results using the same methodology?	- Retain written records to ensure the data is auditable. - Ensure the findings are repeatable by retaining calculations, making explicit the logic and inferences. - Explain and support logic, inferences and conclusions.
Objectivity	Do the researcher's values impact appreciably on the research?	- Carefully document assumptions. - Explain judgements and value-laden aspects of the research.
Resonance	Does the theory or conclusions have bearing and significance? Does the research convince the examiner the student has made the grade?	- Comprehensively describe phenomena or findings. - Show awareness of meanings and causes. - Ensure the findings and conclusions make sense. - Provide deep insight into what is happening. - Check the research against the module requirements and marking criteria.
Usefulness	The research has a practical significance to subjects, researchers, industry and the field (even if it is not unique).	- Make pragmatic interpretations. - Specify the audience and what they can gain. - Identify generic processes or characteristics and their implications. - Contribute to the body of knowledge. - Contribute to society and one's own growth.

Table 12: Validity criteria

Task 22. Plan to produce valid argument and research



Review the points in Table 12. Consider how each point applies to your research, and make a note of that next to the appropriate point. You will use this when designing your research questions and instruments, and when writing up your methodology and the conclusions.

- ① Useful tip: It is more important to deliver valid research than to confirm your original hypothesis was correct. In other words it is just as valid to prove your hypotheses were incorrect. If your results disprove your argument then you will gain better marks by disclosing the fact and explaining why. Perhaps the fault lay in the original assumptions, too narrow a literature search, the methodology, the sample, the analysis or even the interpretation. Your results don't depend on 'proving' your hypothesis!
- ① Useful tip: Absolute accuracy may not be possible in arguments. Persuasive discourse and compromises may be warranted in particular situations and for certain subjects. Academic writers should be aware of the limitations that arise as a result of using persuasion, emotion and compromises and inform their readers accordingly!

8.6 Recommended reading

Bryman, A. and Bell, E. (2003) *Business Research Methods*, Oxford University Press

Onions, P.E.W. (2010) "Work Experience and Student Research", working paper, available online at <http://www.patrickonions.org/docs/academic>

9 Write the research proposal

The research proposal is a simple document typically 2000 to 3000 words in length that outlines a student's plan for the investigation. It sets out in clear terms what the student wishes to achieve, why the topic is worth researching, who or what the subjects are, and how the topic will be investigated.

There are several reasons why a proposal is necessary. It is a course requirement and a requirement for completion of the research module. Students benefit from better outcomes due to planning, identifying risks and early feedback from tutors on topic, problem, method and data. Tutors and supervisors on the other hand can check that the research is achievable, that the outcomes ought to be valid, that there are no insurmountable ethical challenges, and that the student is capable of completing within the time frames.

A proposal should be regarded as a planning document. Occasionally the literature review will indicate at a later stage that the topic or problem is not feasible and sometimes data acquisition issues require a change to the research method. In these cases tutors or supervisors would typically allow minor changes without much ceremony. Major changes may require approval and changes to ethics forms – which may require the approval of a committee. Please consult with the academic team if you are in doubt.

9.1 *Proposal contents*

This section provides a generic list of contents as well as advice on how to prepare them. Students should refer to their module instructions for specific requirements. Students may wish to refer back to the standard conversation in section 3.3.

9.1.1 Title

A title is meant to reference the dissertation, point to the topic, suggest the aim of the research and engage the reader. Titles should be short and precise. Collis and Hussey (p.122) advise students to keep the length to 12 words or less, remove superfluous words, and make it clear whether the investigation is industry or organisation specific. A working title is acceptable for the purposes of a proposal.

9.1.2 Introduction

The introduction describes in an engaging manner what the research is about, why the topic was chosen, and what is to be achieved. This is typically a short section that contains:

- A brief overview of the topic, typically in a couple of sentences or a short paragraph (Chapter 5)
- Context that is relevant to the topic, the research project, its subjects and the researcher.
- Rationale for the study (informed by Tasks 8, 10 and 13) that explains why the topic is of interest to the student and why the research topic is relevant, interesting or useful to the course or field.
- The research problem (Task 13, section 6.5).
- Aims and objectives (Task 13, section 6.5).

9.1.3 Initial literature review

A brief literature review, informed by Tasks 10-12, will demonstrate the student has identified and begun to engage with a relevant body of literature and has identified recent key or important definitions, theories, models, concepts and debates. This should be sufficient to propose potential research questions and expected outcomes, and should form the basis for the

dissertation's literature review. This review should be critical, analytical and well structured. Take the mind-maps prepared for Task 11 (section 6.3), arrange the main branches or concepts of each model in argument order, create a section heading for each of these areas and then write a paragraph under each heading.

Using the example used to build the mind-maps in section 6.3 (Figures 10-12), the structure of the initial literature review for the topic "*The relationship between project team structure and efficiency*" could contain the following sections and content outline:

- Section 1. Project team structure:
 - Definitions.
 - Key theories and models:
 - Physical models.
 - Functional models.
 - Leadership and control based models.
 - Virtual teams.
 - Debates and perspectives.
- Section 2. Project team efficiency:
 - Definitions.
 - Key theories and models.
 - Debates.
- Section 3. The relationship between structure and efficiency. In this example, this section discusses a range of theories and opinions that are grouped around concepts like:
 - Cohesion.
 - Working conditions.
 - Cultural preference.
 - Communications.
 - Control.
 - Context.
- Section 4. Expected outcomes. For this example, the research is expected to confirm the findings of prior research in the areas of:
 - Structure affects team performance.
 - Structure affects team morale and cohesion, which affects efficiency.
 - The relationship between structure and efficiency can vary through the project lifecycle.
 - Structure and efficiency are both affected by context and culture. Any performance is more likely to be attributed to those external factors than to the effect of structure on efficiency.
- A critical assessment of where the proposed research stands in relation to the field.

9.1.4 Research strategy

This section of the proposal will explain how the research will be conducted and why the research choices were made. This will also form the basis of the dissertation's research chapter. Again, using the example "*The relationship between project team structure and efficiency*" to illustrate and referring to previous chapters, the research strategy section should include:

- A discussion of the **context** relevant to the research. In this example's case the research will focus on construction teams. This student may briefly mention the industry focus of the research and discuss the multi-disciplinary nature of teams, nature of contracting, lifecycle of projects, and any other key issues relevant to that industry and the topic.
- Discuss the **nature of the subject**. Using the example, this would describe the context as a complex environment with many influencing factors.
- The **scope** of the investigation. Note any geographic, field, industry or organisation limitations. Discuss any particular perspectives, such as researching from a theoretical or practitioner perspective, from the perspective of a manager or worker, and so on.
- Discuss the **form/s of research** chosen and the reasons for that choice. In this example, the research could involve a description, exploration of the topic since little has been written about the research problem, and testing of the hypothetical models.
- The **research logic** and how it will be implemented. For example, this research will deductively synthesise theoretical models of project team structures, efficiencies and effects of structure on efficiencies. These models will then be evaluated in terms of practice, to ascertain whether practice can be described and predicted using the theoretical models.
- Describe the student's **involvement with the project**, including familiarity with the topic, involvement with the subjects (emic or etic), ability to find and collect data, practical experience, knowledge to use in interpreting the data and so on.
- Describe the **method** selected, why it was selected, and how it will be implemented (i.e. the steps involved).
- Describe the **data and its collection**. Describe the cases to be studied or the sample (number of experiments, observations, respondents, subjects or cases), the population this represents, how the sample will be selected and where the sample will be derived from.
- Propose a set of **research questions**, noting how each question will help achieve the aims and objectives and address the research problem. Questions should be arranged in the same order as the objectives (swim-lanes, section 3.4.1). It is also worth describing what data will be needed to answer this question, and any anticipated answers and findings.
- Discuss issues of **validity, limitations and generalisations**. If this example is studying three small construction firms in Yorkshire, the results may be generalised (extrapolated) to include all construction firms in Yorkshire but not in the UK, globally, to small construction firms, or on any project anywhere. Discuss why.

9.1.5 Preliminary bibliography

References list the literature you actually used to support your claims. A bibliography lists literature that is relevant to the study but not necessarily used in the argument. Label this section accordingly, but if you wish to include both, do not duplicate entries that appear in the References section.

Use citations throughout your proposal and record all references using the university's preferred system. Common mistakes include not having a reference for each citation, not placing references in alphabetical order, having too few references and references that are generally too old. Note that it is NOT possible to prepare a proposal on the basis of having read a couple

of chapters from a single book or a few Wikipedia entries. You should have identified many of the recent theories and consulted several journal papers. The proposal is usually a good indicator of the student's diligence, and tutors and supervisors do take note of this.

9.1.6 Dissertation plan

Review Tasks 5 and 6 in Chapter 4 and present a basic schedule that includes the major tasks and milestones, with start and end dates. At its most simple this can be a list or table. Notice how these in turn suggest research questions that contribute to defining the research problem.

Task 23. Write the proposal



Once complete review the proposal against the module instructions. Does this proposal deliver what the tutor's are expecting? Will this produce valid research? Some advice by Collis and Hussey (p.127) may be considered here:

- Is the proposal too ambitious? Is the proposal too generic?
- Can the topic and problem be described simply to friends and other non-experts? Don't use convoluted or obscure language; clear ideas impress more.
- The proposal is a plan that should be adhered to. Discuss material changes with the appointed supervisor.
- But remember that the proposal is tentative, and can be revised if new knowledge comes to light.
- The contents of the proposal provide a quick start to the dissertation contents. Once approved, they can be transplanted quickly.
- Remember the swim-lanes (section 3.4.1)!
- Review the schedule. Is this achievable?

9.2 The ethics form

Research involves subjects, such as people, animals, plants, property and the environment. These impose a burden on the researcher to respect their rights, feelings, lives, value or ownership. The researcher has to uphold their own reputation as well as that of their university, colleagues, their field and student research in general. Researchers also have to consider their own safety and that of their subjects. This is termed ethical responsibility.

Objections are often raised as to the need for this topic. It may be argued that the value of the research may warrant the means of conducting it, and in reply it can be said that data can always be obtained in an ethical manner and Bachelors or Masters research is seldom rigorous, focused or extensive enough to produce important results. It may also be argued that student research and some subjects are generally innocuous, but ethics applies equally to physical and social research and is a learning exercise that is part of the module outcomes. A third argument is that ethics procedures can be excessively bureaucratic and serve only to protect the university against legal action. Unfortunately such protection is necessary in today's litigious society.

Clues to the purpose of ethics may be found in the following useful checklist for ethics, amended from Denscombe (2002):

- Does the research abide by the laws of the country where conducted?
- Does the research respect the cultural norms of the society where it is conducted?
- Have less intrusive or problematic alternatives been considered?
- Has the research supervisor approved the research from an ethical perspective?
- Has ethical approval for the research been obtained from relevant ethics committee/s?
- Have participants:
 - Been supplied with sufficient information about the research?
 - Given their consent to participating?
- Has the research been conducted with integrity?
- Has the research avoided any misrepresentation or deception?
- Has the data been collected via legal and legitimate means?
- Have the interests of the subjects been protected through:
 - Avoiding stress and discomfort?
 - Maintaining confidentiality?
 - Protecting anonymity?
 - Avoiding undue intrusion?
- Have reasonable steps been taken to maintain the security of the data?
- Has the professional image of the university, staff and students been maintained?

Students are required to discuss ethics in their dissertations, research in an ethical manner, and possibly to complete an ethics form as part of the university's ethics procedures. Further reading may also be found in:

- The university ethics procedure documentation.
- Numerous websites offering useful introductions to the issue such as Resnick (2010).
- Research textbooks that introduce to the subject, such as Bryman and Bell (2003, pp.535-549) and Collis and Hussey (2009, pp.45-47).

Timing of the ethics form submission determines how and when you may proceed. If the only stipulation is that ethics forms are to be completed before research begins, students have the time to study the topic, study the subject or research and formulate their research methodology and research questions.

Some courses however require the ethics form to be completed early in the dissertation process. At such point the student will probably have insufficient understanding of research to appreciate the ethical implications or make an informed selection of research techniques, will have insufficient knowledge of the topic and potential subjects to formulate questions, and may be obliged to adopt a particular strategy that is unsuitable. In such cases, students should prepare an initial proposal and ethics form with the assistance of their module tutor and then submit any changes for approval prior to commencing with the empirical research.

If independent or committee assessment of the ethics form is entailed and students cannot proceed without this, then assessors should be able to provide clear assessment criteria and a marking schema. There should be a template form and clear instructions available. Dissertation module tutors should be able to provide illustrative examples in class, and students should approach their tutor, supervisor or assessor for assistance in completing the ethics form.

Task 24. Prepare your ethics form

Use the information provided above and any further reading and templates provided in the module instructions. Fill in the ethics form and submit this together with the proposal.



9.3 Taking criticism

There are four important stakeholders involved in student dissertations; students, tutors who teach the research and dissertation modules, supervisors who are appointed to oversee each student's efforts, and examiners who mark the final work. Taking criticism from all four will be important to the dissertation's progress, quality and final grade.

9.3.1 Self-criticism

Dissertations are self-governed projects, and students must be able to review, reflect, evaluate and criticise their own work. Students should frequently consider whether their own work is achieving expectations laid out in module instructions and elsewhere. Ideas should be tested, and all work reviewed prior to submission. If in doubt, review the literature on critical thinking¹².

9.3.2 Proposal feedback

The module tutor will usually provide feedback on your proposal, and in extreme cases the proposal may be rejected. This is a good time to learn what will be acceptable in a dissertation and what won't. Problems usually involve the following:

- Topic selection:
 - Too weak.
 - Too broad or too narrow.
 - Not appropriate for the course.
 - Ethical challenges.
- Rationale:
 - Insufficient rationale for researching the topic.
- Literature:
 - Not relevant.
 - Too little.
 - No recent enough.
 - Too much reliance on web sites, not enough journal articles.
- Methodology:
 - Inappropriate or weak selection.
 - Shows little understanding of research strategy, methods and techniques.
 - Poor design, vague or weak questions.
- Other issues:
 - Poor writing style.
 - Plagiarism.
 - Format doesn't follow standard conventions.
 - References are poorly presented or absent.

¹² Such as Cottrell (2005), Fisher (2001) or Chapter 4 of this guide.

9.3.3 Supervision

Your supervisor will be allocated once your proposal has been marked. Be proactive, make contact early and start listening to this person's advice.

Task 25. Reflect on your proposal



The proposal is an excellent point to reflect on what you wish to get out of the dissertation. It is also an opportunity to correct the small things that examiners find irritating:

- Reflect on the proposal and consider any feedback.
- Consider the potential validity of the research.
- Prepare a list of improvements before meeting with your appointed supervisor.
- Don't wait to meet the supervisor before resuming with the dissertation. Start immediately on the next chapter.
- Consider starting with data collection. Read Chapter 12 and begin to make contact with potential case study organisations, forums or respondents. You don't have to send them the questionnaire, merely establish their interest. This can take time and you do not want to be waiting several months for people to agree to do your survey!

9.4 Recommended reading

Collis, J. and Hussey, R. (2009) *Business Research*, Palgrave Macmillan, pp. 109-139

Cottrell, S. (2005) *Critical Thinking Skills*, Palgrave Study Skills

Northedge, A. (2005) *The Good Study Guide*, Open University Press

Onions, P.E.W. (2009) "Thinking Critically: An introduction", working paper, available online at <http://www.patrickonions.org/docs/academic/2009%20Thinking%20critically.pdf>

10 Write the introduction

The Introduction is the first chapter in a dissertation. As it contains much of the material developed in the proposal, it is a good idea to proceed with it immediately after submitting the proposal.

The strategy of this guide is to take students step-by-step through the process of preparing a dissertation. Some aspects of the project will not be clear early in the process, but will nevertheless need to be talked about. Do not despair. Instead, return to these sections later when all is revealed, and make the necessary changes.

10.1 Contents of the introduction

Returning to concepts discussed in Chapter 3 and the contents of a dissertation's introductory chapter contained in the first three questions of O'Leary's standard conversation (Table 4):

- Tell me what your research is about?
- Why did you choose this particular topic and research problem?
- What do you hope to achieve?

An introduction will take and expand upon the proposal's introduction (section 9.1.2):

- A brief description of the topic.
- Context relevant to the topic, the research project, its subjects and the researcher.
- Rationale for the study, and its relevance to the student, course and field.
- The research problem.
- Aims and objectives.

It is suggested that a further section called "*Dissertation outline*" or "*Structure of the dissertation*" be included at the end of the Introduction or on its own page following the Abstract. This will briefly explain how the research problem was tackled by outlining the main contents and findings of each chapter. A single paragraph for each chapter is sufficient. Some examiners do not like these, and in that case the paragraph can be used as the first paragraph in each chapter (see section 10.3.1 below).

An outline is a useful summary for readers/examiners, and it helps plan your work. It is recommended that this is written up now before commencing with writing up the remainder of the Introductory chapter.

Task 26. Write the dissertation outline

Write a short paragraph for each chapter based on suggestions above.



10.2 Tone of the introduction

Writing up research is a form of communication. You have knowledge and you need to communicate that knowledge to an audience in a way that ensures they receive it and understand it. This must be in a form and manner that is palatable to that audience.

The audience for a dissertation is very limited and they are constrained by opposing demands. One or two examiners will read the work and they are obligated to ensure the student has achieved the aims of research and the module. They need to make sure the dissertation demonstrates the learning outcomes and complies with the requirements. At the same time they are pressed for time when marking and are unlikely to spend more than a couple of hours on each one. The introduction is the first major section to be read and if it is weak or vague then it will be hard to shake that initial impression. Make sure it:

- Sets expectations.
- Provides the reader a clear framework on which to base their reading of the remainder of the dissertation. Like a roadmap it will provide the reader with a clear general idea of where the study is going.
- Do not go into great detail. The various issues will be critically analysed and evaluated in later chapters.
- Do not mention findings or conclusions, this is about what you are going to do.
- Engage the reader. Be interesting but remember not to use emotive and unsubstantiated discussion.

10.3 Bookends of a chapter

What does one write for the first and last paragraphs of every chapter? The role of first and last paragraphs is to describe and then summarise what is in that chapter. This improves the overall readability and helps to maintain continuity with previous and following chapters.

10.3.1 First paragraph/s of a chapter

The opening remarks of a chapter should contain:

- A sentence or two **linking** this chapter to the previous chapters or argument. For example, *“Stress has been identified in the introduction as a cause of inefficiency and burnout in project management.”*
- **Objective** for the chapter. For example, *“This chapter will present a review of literature relevant to the study of stress in project management.”*
- A brief **overview of the contents**, ideally summarising the main headings in the chapter. For example, *“The review will include definitions, types, causes, effects and mitigation of stress, and present a theoretical model summarising the nature of stress in project management.”*
- **Findings or conclusions**, for example, *“This review finds that stress is a complex and broad phenomenon that deeply affects the ability of project managers to execute their roles. A theoretical model of stress is synthesised to describe and explain the phenomenon.”*

These sentences can be concatenated into a single paragraph at the beginning of the chapter, in this example for the literature review:

“Stress has been identified in the introduction as a cause of inefficiency and burnout in project management. This chapter will present a review of literature relevant to the study of stress in project management. The review will include definitions, types, causes, effects and mitigation of stress, and present a theoretical model summarising the nature of stress in project management. This review finds that stress is a complex and broad phenomenon that deeply affects the ability of project managers to execute their roles. A theoretical model of stress is synthesised to describe and explain the phenomenon.”

10.3.2 Last paragraph/s to a chapter

The closing remarks for a chapter should contain:

- A sentence describing what the chapter **covered** to remind the reader. For example, *“This chapter has reviewed literature discussing the nature and effects of stress in project management.”*
- A summary of each **key concept** or research question, and what the chapter achieved in that respect. For example, *“A number of definitions and models of project stress were encountered. Inevitably in the absence of theoretical agreement, a variety of theories and models of stress and its causes and effects were encountered.”*
- Implications for the **topic and project aims**. For example, *“Little formal research into mitigation and management of stress was found. This presents a problem for practice and an opportunity for research.”*
- Implications for the **research project objectives**. For example, *“The concepts encountered are synthesised into a hypothetical model that helps fulfil the project objective of identifying a pragmatic solution.”*
- **Links** to subsequent chapters. For example, *“The hypothetical model may now be used to develop research questions in order to empirically test and evaluate its soundness.”*

Again, these sentences may be consolidated into a single paragraph as appropriate.

It may help not to confuse the reader by using the word ‘conclusion’ anywhere other than for the chapter entitled “Conclusions”. The words ‘chapter summary’ or ‘chapter review’ may be used instead.

Task 27. Write the Introduction

Identify what is expected of you:

- Reflect on the proposal and consider any feedback.
- Review the marking schema for details of what to include.
- Visit the Library or ask your supervisor for some copies of past dissertations from your course and level. Make notes about what to do and what is expected!
- Now write the Introduction chapter.
- Leave it for a day or two whilst continuing with the next tasks, then come back and review it.



10.4 Recommended reading

Bryman and Bell (2003, pp.519-525), in describing different approaches for writing up quantitative and qualitative research.

II Review the literature

A literature review is a concise critical summary of literature that is relevant to the topic. It is also the process of constructing that summary, through selecting, reading, critically analysing, critically evaluating and summarising the literature.

11.1 What is the purpose of a literature review?

A literature review is an essential component of your dissertation. Webster and Watson (2002) suggest the review performs a couple of functions:

“A review of prior, relevant literature is an essential feature of any academic project. An effective review creates a firm foundation for advancing knowledge. It facilitates theory development, closes areas where a plethora of research exists, and uncovers where research is needed.”

Although the review doesn't count for a major proportion of the marks, it does have a major impact on the overall grade. Randolph's (2009) excellent article raises a host of objectives for the literature review:

- To provide proof of knowledge.
- A publishable document.
- Informs the student of the influential researchers and research groups in the field.
- Provides boundaries for the research problem.
- Seeking new lines of inquiry.
- Avoiding fruitless approaches.
- Gaining methodological insights.
- Identifying recommendations for further research.
- Seeking support for grounded theory.
- Distinguishing what has been done from what needs to be done.
- Discovering important variables relevant to the topic.
- Synthesising and gaining a new perspective.
- Identifying relationships between ideas and practices.
- Establishing the context of the topic or problem.
- Rationalising the significance of the problem.
- Enhancing and acquiring the subject vocabulary.
- Understanding the structure of the subject.
- Relating ideas and theory to applications.
- Identifying the main methodologies and research.
- Discovering techniques that have been used.
- Placing the research in a historical context.
- Show familiarity with state-of-the-art developments.
- Provide a framework for relating new findings to previous findings.

Objectives such as these may be used to guide the literature review and then self-evaluate it once complete.

11.2 Plan your review

Literature reviews have a tendency to wander off course, fail to spot key theory or even go into too much detail. A little planning will ensure your review is accurate, meticulous and sufficient whilst being completed in the least possible time. Planning involves paying attention to three areas.

Choosing a **review approach** will depend on the form of research logic (section 7.3). If you have decided upon a **deductive logic**, the literature review will serve to inform you about the topic and establish what has already been done about the problem. A theoretical model may be synthesised from the literature, and/or a set of research questions or hypotheses to test. Here the literature review is usually completed before empirical research begins.

If you have selected an **inductive logic**, a brief and broad literature review may be used to inform your methodology before empirical research begins. The review undertaken for the proposal should be sufficient. A detailed literature review will then be conducted once the empirical research is complete with the intention of explaining the observations made. The structure of the review itself will follow the theory or model that emerges.

There is a fine balance between keeping the **scope** of the enquiry as tight as possible and conducting a thorough investigation. You are almost guaranteed to encounter unexpected concepts and perspective that appear relevant and the temptation to explore interesting side-issues can be great. Reviewing literature is also a good excuse to procrastinate on the unpleasantness of a research methodology.

How do you prevent a seemingly simple topic from growing quite rapidly or deal with it when this occurs? There are two ways of **controlling the scope**. The first is to focus on a specific detail or element of the topic. For example, a broad topic such as “*An investigation into factors affecting the performance of social workers*” can be managed by:

- Narrowing the range of subjects or scope: *An investigation into factors affecting the performance of social workers in Birmingham.*
- Narrowing down to a single industry or organisation: *An investigation into factors affecting the performance of social workers in XYZ environment.*
- Narrowing the focus: *An investigation into motivational factors affecting social worker performance.*

The second scope control tactic is to choose a perspective. Choosing one side of an argument is valid as long as the other viewpoints are acknowledged, the choice is explicit, reasons for the choice are presented, and the choice is critically assessed (i.e. what are the strengths and weaknesses of this side of the argument?) Using the previous example, the performance of social workers could be considered from the perspective of their managers, the social workers themselves, those people using the social workers’ services, and even the taxpayer who funds the services.

Your **choice of literature** will trade off time against depth and topicality. The preliminary literature search (Chapter 6) would have encountered a dozen or so articles and introduced you to the finer points of reading and writing. At this point you need to reconsider your topic, the argument and preliminary literature and ask yourself:

- Have I gathered the latest thinking on my topic?
- Does this literature provide evidence/support for my argument?
- Do I have enough contrasting viewpoints to allow me to critically analyse my argument?
- Does this literature raise any potentially researchable problems?

Conversely, at this stage there are a number of questions you should not be asking:

- What must I read? This should be informed by the theory and debates you discovered whilst searching for literature discussing your topic.
- I can't find any relevant literature? Reread section 6.2.
- How many references should I have? The answer is: it depends! Your argument or position must be supported by evidence, and you must show a good understanding of the key theories, concepts, definitions and debates relevant to your topic. Your references should be dominated by literature written in the last 5 years and showing a good mix of journal articles and books, with possibly half as many websites. It depends!

Try not to confuse the reader by using the word 'conclusion' anywhere other than for the chapter entitled "Conclusions". The words '*chapter summary*' or '*chapter review*' may be used instead.

Task 28. Review the topic

Consider the feedback from the proposal and literature subsequently read. If necessary, narrow the topic down.



11.3 Read literature

Use a literature search to identify more focused and relevant material. Read this with the intention of filling out, extending, adding more evidence for and/or even contrasting or replacing the mind-maps described in section 6.3 and constructed for the proposal.

Task 29. Extend the mind-maps

Review the advice given in section 6.2, and extend the search to more recent, relevant and rigorous sources.

Develop the mind-maps until clear conceptual categories have emerged and very few new sources can be found (saturation is reached).



11.4 Write up the literature review

The literature review is a carefully constructed summary of literature. This section offers a collection of suggestions to bear in mind whilst writing up the review.

11.4.1 A beginning

Like any chapter your literature review should start with a brief introduction to the chapter and an outline of what it will contain. You should summarise the argument and briefly describe the structure (sections). Refer to section 10.3 for explanation and examples.

11.4.2 Decide on a structure

Bem (1995) cautions that “*Authors of literature reviews are at risk of producing mind-numbing lists of citations and findings that resemble a phone book - impressive case, lots of numbers, but not much plot.*” A review structure or outline of headings will help focus your thoughts, make the argument a lot more coherent, and make the reader or examiner’s job a whole lot easier. There are a number of choices here, as there are with just about every aspect of dissertations. Several schemas or structures may be employed:

- **Journal:** Here the student describes each article or book as it is encountered. There are very few situations where this approach could be considered valid, and this approach greatly hampers critical analysis and evaluation.
- **Chronological or alphabetical:** There are few approaches, such as those involving content analysis, that a chronological (year of publication) or alphabetical (author’s name) structure is an appropriate strategy. Generally this structure will also hamper critical analysis and should be avoided.
- **Theoretical model based:** The review may be structured according to the concepts, relationships and behaviours of a specific theory or theoretical model in situations where the student encounters a particularly comprehensive and relevant example. As long as the model is appropriate, valid and established, this approach can result in a strong review. For example, a review of the subject of communications could be based on the Berlo (1960) model of communication, and the review would be written up in four sections entitled “Source”, “Message”, “Channel” and “Receiver”. You will need to announce your strategy and discuss the model at the beginning of the review, and explain why this is the best model for structuring the review.
- **Concept-centric:** A review will frequently encounter a broad range of seemingly relevant concepts. Writing the review according to these concepts will help you build a clear structure and apply critical analysis to a large and unmanageable collection of literature. Literature discussing similar things can be compared and contrasted, conclusions drawn and hypotheses formulated. Typically a concept-centric literature review will use a structure-within-a-structure. The broad format is:
 - Definitions of the main concepts or topic.
 - Review of the topic as a whole.
 - Systematic review of each of the relevant components or concepts.
 - Review of the relationships between concepts.
 - Review of the behaviours or phenomena relevant to each concept.
 - Provide a summary model.

Remember the swim-lanes. Keep the review consistent with the subject and order of the research objectives, questions, hypotheses and so on. Build sections in each chapter in the same order, using relevant headings with the same terminology throughout the dissertation.

Task 30. Prepare a tentative review outline

Analyse the mind-maps, identify a conceptual or other structure, consider the swim-lanes and create all the section headings in the dissertation document. Now write up the chapter introduction.



11.4.3 Fill in each section

Literature reviews are particularly indicative of a student's ability to think critically. Start work on the literature review's contents by reviewing section 4.9.

Section-by-section identify the definitions, theory and models from the mind-maps that are relevant to that section. Organise these concepts into a sequence that reflects your argument and write these down as a series or list. Each will now become a self-contained paragraph. Define and describe the concept. Describe how it relates to the topic and show how the concept and each paragraph links to the other. Reference relevant theory, illustrate it with anecdotes and examples and argue the validity of the concept. Make supported judgements when appropriate and be sure to include arguments that don't necessarily agree with your argument.

Task 31. Start writing the literature review

Critically analyse and evaluate what has been written in literature about the subject of each section. Keep it relevant, on topic and researchable.



11.5 Ending your literature review

Your literature review should now consist of introductory paragraphs and a series of headings that contain discussion in a series of paragraphs. This discussion now needs to be concluded and there are three ways of doing this; as a summary, with a model or with questions.

11.5.1 Conclude with a summary

A summary gives the reader an opportunity to recall all that has been presented to them. In this case the argument will be summarised in a series of short points, followed by a set of clear statements of where the argument and its various strands have led to. Typically this will be a **theoretical stance**, a position that you have arrived at from a critical review of literature and from which research questions can be derived.

Section 10.3 provides further explanation and examples of closing a chapter.

Task 32a. Prepare a model

If you have chosen to conclude with a summary then prepare this now. Remember to critically evaluate.



11.5.2 Conclude by synthesising a theoretical model

Where analysis is the breaking apart of a problem, synthesis is the putting together. This technique may be used in situations where knowledge needs to coalesce into a clear understanding – such as with *inductive logic*. Analysis and synthesis are not opposing techniques either and may be used as a powerful combination. The short article by Dubberly *et al.* (2008) is recommended.

One output of the literature review may be a hypothetical model. A frequently used technique is to synthesise the theories and models discovered during the course of the literature review into a model that describes the problem or predicts its behaviour. This model is then researched

empirically to determine whether it is valid or not. What is a model? It is a simplification of reality, a phenomenon or a problem that is used to explain, understand, make predictions and in some cases may be used as a framework to base further knowledge or enquiry upon. As a generalisation a model will describe only the most significant and relevant entities, their behaviours and the relationships between those relationships. Since a model is only a representation of reality, it is valid to reflect that reality from a single perspective.

How does one build such a model? One straightforward approach is to:

- Collect all the theories and models discovered.
- Identify the concepts in the theory.
- Filter out the irrelevant concepts.
- Identify the significant or important concepts, typically those appearing most frequently.
- Group, categorise and label these as entities or dimensions.
- Identify and describe the generic behaviours of each entity.
- Identify and describe how each entity and dimension relates to the other.
- Describe how the entities, behaviours and relationships work as a system.
- Possibly describe the environment or context of the system.

Obviously a critical model will consider various opposing viewpoints, problems, limitations and shortcomings. Critical evaluation should judge the model from a theoretical perspective, possibly against a particular theory or theories.

Task 32b. Synthesise a model

If you have chosen to synthesise a model then do a Google search and read a bit more about what a 'theory' is and how to model one. Then construct the model.



11.5.3 Conclude by developing a set of hypotheses

A hypothesis is a proposition that states a position that is then used as the starting point for further investigation to prove or refute each hypothesis. This is an essential aspect of *deductive logic*. A hypothesis will have certain properties (with points from *Transitions in Society* page 65):

- It does not have to be correct. In fact it is a guess or prediction.
- It may be inferred from the theory.
- It will focus the investigation.
- It will embody the research aims and objectives.
- It is written in the form of a concise statement.
- It reflects a position being taken by the writer.
- It is arguable, and a contrary position can be taken.
- It requires research to determine whether or not it is true.
- It is a significant matter to social scientists.
- It is a complex notion, dealing with a number of variables.
- It is not written in the first person.
- It can be tested.

The literature will be used to build a set of these testable guesses or predictions. Identify a few key issues or aspects of the topic that need to be researched. Then identify what it is about them that you need to know. Consider how this will improve your understanding. Turn this into a statement that can be tested. Any tentative hypothesis may be formalised to reduce ambiguity, and this may be done by writing it in an “if-then-because” format. Remember that deriving hypotheses and research questions is a complex activity and several iterations may be needed before both are finalised.

To illustrate, a working example has been taken from a journal article by Furumo *et al* (2006) entitled “Do Project Management Tools and Outcomes Differ in Organisations of Varying Size and Sector?”

- *“H1: Projects in public sector organisations are more likely to go over-budget than projects in private sector organisations.*
- *H2: Projects in public sector organisations are more likely to be delivered late than projects in private sector organisations.*
- *H3: IS project team members are more likely to be dispersed geographically in public sector organisations than in private sector organisations.*
- *H4: IS project teams in public sector organisations are more likely to use standardised tools and procedures such as the WBS, network analysis, Gantt charts, and Earned Value Reports than teams in private sector organisations.*
- *H5: Projects in small organisations (≤ 500 employees) are more likely to be delivered late than projects in large organisations.*
- *H6: Projects in small organisations are less likely to come in over-budget than projects in large organisations.*
- *H7: IS project team members are less likely to be dispersed geographically in small organisations than in large organisations.*
- *H8: IS project teams in small organisations are less likely to use standardised tools and procedures such as the WBS, network analysis, Gantt charts, and Earned Value Reports than teams in large organisations.”*

Task 32c. Develop a set of hypotheses

If you have chosen to end your literature review with hypotheses then derive a set and assess them for relevance and ability to research the topic. Discuss these with your supervisor at the next opportunity.



11.6 Self assess your review

Self-assessment is an essential activity in writing a dissertation. It allows you to clarify your thoughts, focus your argument and correct errors before submission.

Use the module information, criteria in Chapter 2, the marking schema in Appendix 1 and the validity criteria in section 8.5 (Table 12) to assess your literature review. Examine the structure, section headings and content to determine whether your argument is strong, flows consistently, is readable and enough evidence is presented for each statement or premise in the argument. Have you covered the major theory and debate in this subject area? Does the literature review support any tentative model or questions you may have derived? Does this tell the examiner that you know enough about the subject to talk authoritatively about it?

Task 33. Assess your literature review

Try to leave a couple of days between completing the writing up and self-assessing your own work. Read it from the standpoint of an outsider. Don't look at spelling and grammar (although that is important). Consider the writing from the perspective of the argument and from its readability. Use the points at the beginning of this chapter.



11.7 Recommended reading

Students are also advised to find textbooks that provide detailed explanation of their chosen research method. These often discuss the literature review, usually in a manner that is relevant to the paradigm that method is associated with.

A number of other publications may assist in writing up the literature review:

Dubberly, H., Evenson, E and Robinson, R. (2008) "The Analysis-Synthesis Bridge Model", *Dubberly Design Office*, available online at <http://www.dubberly.com/articles/interactions-the-analysis-synthesis-bridge-model.html>

Furumo, K., Pearson, J.M. and Martin, N.L. (2006) "Do Project Management Tools and Outcomes Differ in Organizations of Varying Size and Sector?" *Interdisciplinary Journal of Information, Knowledge and Management*, Volume 1

Lipowski, E.E. (2008) "Developing great research questions", *American Journal of Health-System Pharmacy*, Vol. 65, No 1, available online at <http://www.ashpfoundation.org/MainMenuCategories/ResearchResourceCenter/FosteringYoungInvestigators/AJHPResearchFundamentalsSeries/Developinggreatresearchquestions.aspx>

Northedge, A. (2005) *The Good Study Guide*, Open University Press

Randolph, J. (2009) "A Guide to Writing the Dissertation Literature Review", *Practical Assessment, Research & Evaluation*, Vol. 14 No. 13, online at <http://pareonline.net/getvn.asp?v=14&n=13>

Webster, J and Watson, R.T. (2002) "Analyzing the past to present for the future: writing a literature review," *MIS Quarterly*, (26:2) pp. xiii-xxiii

12 Select and collect the data

At this point you will have a topic, project aims and objectives, a clear understanding of the theory and a testable position. This chapter will show you how to begin the process of testing that position.

Phenomena will involve the real world unless you are studying mathematics or a theoretical subject. If your research logic is inductive then the real world will need to be studied in order to derive patterns, trends and properties that may be generalised into a theory. If your chosen logic is deductive then you will have a theoretical position or questions that need to be evaluated or tested to determine their validity (sometimes termed empirical testing). Data gathering is the process of planning, preparing, observing and recording the study of that reality.

Data collection is seldom adequately planned for. This section will try to steer you around a range of problems like choosing phenomena that are difficult to research, inexperience, too little time to solicit respondents, too little or no access to data, ethical issues, poor interview and survey skills and poor research questions.

12.1 Develop research questions

Research questions translate a theoretical stance or hypotheses into specific, actionable lines of enquiry to investigate.

Collis and Hussey (2009, p.117) provide definitions and advice on preparing questions for positivist and interpretive studies. Bryman and Bell (2003) offer general advice (p.37-39) as well as specific rules for designing questions (pp. 163-173). O'Leary (2005, pp. 32-36) gives sound advice for developing questions for real-world problems.

First and foremost, questions must answer the aim and objectives of the research. Dissertations will automatically receive a bad grade if there is a strong mismatch between the two. Design your questions by asking *"Will these questions accurately and comprehensively find an answer to the aim and objectives?"*

Students often ask how many questions they should be posing to their subjects. Unfortunately there is a growing and unacceptable trend for students to employ a 10-question web based survey¹³. The number of questions will be highly dependent on the nature of the research and your theoretical position. If you are inductively studying a complex situation then it may be possible to explore it using a couple of broad questions to prompt research subjects in a semi-structured interview. On the other hand a deductive study will require a set of carefully crafted questions to investigate aspects of each of the hypotheses. It is very unlikely one can examine a complicated topic such as the relationship between stakeholders and construction procurement strategies using only ten standard multiple-choice questions.

Some points to consider about the number of questions you need:

- Questions to identify your subject or respondent, such as name or species.
- Questions to identify characteristics of the subject that are relevant to your study, such as age, gender, height, weight, colour and geographic location.
- Details of the observations made, such as date, time, interview duration and location.
- At least one or two questions for each of the research problems.

¹³ This is due to the policy of the popular survey site Survey Monkey that offers registered users three free surveys of a maximum of 10 questions each. Some questions will be taken up with basic demographics (which are seldom used for analytical purposes later), students are effectively trying to answer difficult questions and establish complex relationships by asking a couple of simple questions.

A dissertation entitled “*The role of the project manager*” for example may involve questions that are a more open and qualitative in nature rather than strictly quantitative. In this example the following are typical questions that may be posed in an interview:

1. Respondent’s name.
2. Respondent’s employment details:
 - a. Public or private sector, if this matters.
 - b. Large or small organisation (larger organisations can hypothetically afford to employ or deploy people as specialists; smaller firms will want their project managers to perform many roles).
 - c. Job title.
 - d. Seniority (managers of project managers and programme managers have different roles to junior project managers and coordinators).
 - e. Term in that firm (a new employee may have a different view on what is expected of them than employees who have been in the job for many years).
 - f. Experience.
3. “*Describe the role/s you perform?*” An open-ended question for the respondent to allow the survey to gather data you and the literature have not thought of – in itself an interesting and valuable conclusion.
4. “*What percentage of your week do you spend on each role?*” Some roles will be more important than others, and this will allow you to more accurately compare one subject against another.
5. “*How would you rate your skill level at each role?*”
6. “*How did you acquire the skills needed to perform each role?*”
7. “*What project management methodology does your organisation use?*” Methodologies differ in what they expect a project manager to do.
8. “*Does your role change throughout the project lifecycle?*” It should do because project managers plan at the start and control during implementation.
9. “*How many projects do you control?*” A project manager with one large project may have a very different workload to one with a dozen small projects. Ideally you should also be finding out how much time they spend on each role on each project.
10. “*What factors do you think impact on your role?*” Here you should have a checklist of factors that you identified in the literature, as well as allowing the respondent to supply their own.
11. “*Does your firm recognise and describe all these roles in your job description?*”
12. “*Do you think project management theory understands or explains the different roles?*”

Lipowski (2008) offers some good advice on how to develop research questions, as does O’Leary (2004) who suggests the following for research question design:

- Does the question define the investigation, set boundaries and provide direction?
- Is the question relevant and right for this research?
- Will the findings be valid, prove or indicate anything?
- Is the question well articulated?
- Are there any assumptions that need clarifying?
- Is the question doable? Can data be collected?
- Does my supervisor agree the question is right?

Other points you may wish to consider include:

- What do I need to know in order to achieve my aims?
- What is it about my topic that I want to investigate?
- What are the important research questions in my field?
- What areas need further exploration?
- What theory-based questions can I ask about my subjects?
- What can I ask that will confirm or refute hypotheses?

Task 34. Develop your questions

Prepare a set of research questions. Leave them for a day or so, then return and ask yourself whether they adequately investigate what you want to study. They may also be different to your proposal's questions. Discuss with your supervisor at the next meeting.



12.2 Choose the evidence

You now need a subject to question and the subjects or evidence you require should be:

- Researchable.
- Relevant.
- Accessible.
- Sufficient.

Other relevant conditions to consider include time, availability, researcher experience, difficulty in persuading the subjects to cooperate or divulge information, ethical considerations and intellectual property issues. The following steps will help in identifying *data sets*, or general sources and groups of data:

- Reflect on the discussions about method selection in Chapter 8.
- Abandon any secondary data such as tables of data found in literature unless that data is highly relevant to your research. Even then it may not be acceptable and primary data may be required.
- Define one or more data sets that cover:
 - The evidence needed to support the investigation.
 - The estimated population and sample.
 - Potential types and sources of evidence.
 - The techniques needed to collect this data.
 - What effort and time is required to collect this data?
 - What mechanisms are required to record the data?
- Choose the most feasible data set. This will be your population (see below).
- Identify what limitations this imposes on:
 - The research.
 - Any findings.
 - The conclusions.

12.3 Decide on a population and sample

The research *population* is the universe or entire body of subjects that the research will draw the subset or *sample* from. For example, one student researcher chose to interview a panel of five academics from one university as a sample of the population of all academics in that university.

There is a relationship between the knowledge claims that your research will make and the population and sample. A student may claim that five tutors are a representative sample of all the university academic staff. This will be correct depending on how large the population is (how many academic staff at the university), the distribution of the staff (were they all from the same faculty, or chosen at random from across the whole campus) and the specialisation of the staff.

There are statistical formulae available for calculating the sample size based on the population, error and distribution. A literature search will reveal numerous authoritative statistics textbooks.

It is highly unlikely however that any undergraduate and most postgraduate research will be seen and used outside the teaching environment, so sample size is ultimately quite unimportant (although getting the calculations right is). It is therefore recommended that students work backwards. Rather than aim for a specific sample size, it is recommended that students choose the best data set available, obtain as many respondents or units as possible, then analyse the limitations and implications once the research is complete.

Depth of the investigation should also determine sample size - wide and shallow, or narrow and deep. Ask many subjects a few simple questions, or a few subjects a number of deep and probing questions. In situations involving action research and the case study method, it is possible to research a single organisation (although Yin, 2003 p.19, notes the limitations of doing so).

Task 35. Choose evidence

Decide on what evidence you need, the population and the sample. Consider whether these are researchable and whether they are appropriate given the project aims, objectives and hypotheses.



12.4 Data collection tools and techniques

Collis and Hussey (2009, Chapters 8 and 10) differentiate between qualitative and quantitative data collection; particularly in the recording of richness, depth and context in the case of qualitative data, and the precision and quantification involved with quantitative data.

Data collection tools and techniques should be suited to the type of research, nature of the subject, analytical requirements, need for inspection and other validation issues. The choice of collection tools and techniques should allow the reader or examiner to determine the validity of your claims and to allow other researchers to reproduce your research if necessary.

Students will need to design and document their data collection tool or technique, apply it to the set of data, then draw brief conclusions about the performance of that tool or technique. A wide array of tools and techniques are available to them, and students are urged to look beyond the survey that is taught on most research modules.

12.4.1 A range of tools

Data collection tools are physical apparatus that include:

- Data logging software.
- Questionnaires.
- Recording devices, like cameras, data loggers, interval meters and gauges.
- Scorecards, checklists.
- Software to analyse structured data (data mining, database analysis etc).
- Software to analyse unstructured data (text/content/document analysis).
- Spreadsheets.
- Surveys, such as paper based, electronic, web, telephone, and mail based options.

12.4.2 A range of techniques

Data collection techniques are processes and activities that include:

- Archival, historical and bibliographic studies of text.
- Brain storming and other workshop techniques.
- Cognitive mapping.
- Concept analysis.
- Content and document analysis.
- Delphi technique.
- Diaries.
- Experiments.
- Focus groups.
- Interviews:
 - Structured.
 - Unstructured.
 - Repertory grid.
- Laboratory experiments.
- Mind-mapping and other analytical methods.
- Observation.
- Protocol analysis.
- Reflection.

12.4.3 Choosing an appropriate tool or technique

Sridhar (2007) regards the choice of data collection method as a trade off between:

- Suitability to the problem (nature, scope and objectives).
- Available and required resources.
- Competence of the researcher.
- Kind of data to be produced.
- Scale of the study.
- Unit of enquiry and analysis.
- Depth of data required.
- Precision (reliability) required.
- Sample size and spread.
- Qualification of respondents.

This guide regards the criteria for data collection tools as being:

- Efficiency.
- Data quality and adequacy.
- Neutrality.
- Anonymity.
- Supervision required.
- Control of context and question order.
- Ability to use visual aids.
- Control of variables.
- Dependence on literacy and numeracy of respondents.

Note that you may wish to consider using more than one technique to collect data to obtain a bigger picture, to deal with a difficult range of data or to triangulate.

12.5 Evaluate your instruments with a pilot

Inspecting your research tools or techniques against various research criteria is necessary but may not uncover all potential problems. Expect the unexpected. A pilot may be useful to determine whether the instruments are suitable and produce useful results.

A pilot should be conducted using a very small sample of the target population. In qualitative research you may be looking at a published case similar to the empirical one you wish to study. For interviews or surveys you may find it appropriate to use fellow students. Run the pilot in similar conditions and be sure to check for the following to improve your questions and instruments:

- Are the observers trained and able to conduct the study?
- Are the instructions clear and understandable?
- Are the subjects comfortable and prepared? Are they eager or reluctant?
- Are the questions intelligible?
- Do the respondents find they are excessively constrained by a question? Do they wish to add more or answer in a way you are not allowing?
- Do the subjects struggle with the questions or are the tasks too difficult to perform?
- Are the results unusually skewed? Are there any anomalies in the results?

Task 36. Choose and test appropriate tools and techniques

Decide on your research instruments and consider whether they are suited to exploring the data, producing valid results and suited to your skills. Design the instruments.

Now test these with a pilot or other mechanism.



12.6 Preparation

Data collection can be a laborious and time-consuming activity that requires meticulous attention to detail. Simple preparations can ensure this is efficient and accurate.

- Prepare the respondents or subjects.
 - Pre-qualify the subjects by investigating whether they are relevant and suitable
 - Make contact by speaking to intermediaries (like friends and family), identifying the right people, joining forums and even sending out invitations (and the questions once the ethics approval is obtained).
 - Obtain permission to survey professional groups from their association or body.
- Prepare to keep records:
 - Organise any documents, surveys, guides and letters.
 - Obtain and configure any recording tools, such as Dictaphones, cameras, spreadsheets or online survey tools like Survey Monkey.
 - Prepare a folder or file to hold the completed questionnaires or observation sheets.

How you collect data will depend on the method, instrument and type of data you have selected. Textbooks may be referred to about the application of specific instruments. In general, collect the data in a meticulous, systematic, controlled fashion. If your study is quantitative you need to be accurate and efficient and ensure your observations or responses are genuine. If your study is qualitative then you may need to explore depth, ambiguities and explanations.

Treat your subjects or respondents with respect. Start the interview or survey with a clear concise introduction. Be friendly, they are after all helping you achieve your grade. Comfortable subjects will tend to be more cooperative and the data more accurate. Try to be unbiased and neutral when applying instruments. Do not make judgements as this will be the function of the data analysis, and deal with rejection and problems in a professional manner.

12.7 Writing up

Data should be recorded as it is collected, and researchers may want to consider writing a short note about each interview or survey. This will ensure the records are accurate and any nuances or useful observations will be available for interpretation.

The raw data will not be written up in the body of the dissertation. It should be presented in the appendices if it is of a manageable size (such as a handful of interview notes or a table of experimental results), or be available in a separate data schedule (a 'book' with a title page, list of contents and then each form, survey or set of observations in some order).

Reflect on your collection as you proceed. You may need to fine tune the instruments or the sample based on how the study is progressing.

Task 37. Gather and write up data

Contact your subjects. Apply the instruments. Collect and record the data. Make observations and reflect on the study as you progress.



13 Analyse and interpret the data

Analysis is the process of discovering structure and meaning in the data. It is a process, a skill and an art, and not every student is adept at deriving valid and insightful interpretations from their data. This chapter provides some pointers on how to analyse the data and write up the findings chapter, but it is not a tutorial on statistical analysis, synthesis or other techniques.

13.1 Analytical thinking

Data analysis begins with learning some analytical skills that are related to but not the same as *critical analysis*. Analysis will involve steps and skills such as:

- Standing back from the data.
- Examining the data in detail from many angles.
- Asking “*What does this mean?*”
- Ensuring the data is:
 - Complete.
 - Anticipated.
 - Logical, given the questions, context and subject.
- Comparing the findings to:
 - What you expected to find.
 - The theoretical model or questions.
 - The findings of other researchers.
- Looking for and explaining:
 - Why different researchers arrived at similar or different conclusions.
 - Conformities and differences.
 - Anomalies, gaps and unusual/unexpected measurements.
 - Trends, patterns and structures.
- Being able to argue why the data supports one set of theory over another.
- Being on guard for statistical and logical mistakes.
- Checking for hidden assumptions and alternative explanations.

Task 38. Review the data

Review the data (as it is emerging or once all the data is collected) by applying the above skills to it. Make notes on anything you observe, however simple it may be. Perhaps a lot of questions are unanswered, or you don't understand why a certain group answered a particular question that way. This is not a proper analysis, just an exercise to get you to think more closely about the data.



13.2 Analysis choices

Analysis is a process of breaking down and explaining. Choice of analysis depends on a number of criteria. First and foremost is the nature of the data. Is it suited to numerical analysis and will numerical analysis produce any meaningful explanation? Or is it suited to non-numerical interpretation? Collis and Hussey (2009, Chapters 9 and 11) provide a useful explanation that distinguishes between analysis of qualitative and quantitative data. Other factors that have a bearing include:

- The type of interpretation you wish to make.
- The form and logic of the research (inductive versus deductive).
- The research topic.
- The research subjects.

The following table, based on Bryman and Bell (2003), suggests some options:

Factor	Quantitative analysis	Qualitative analysis
Data type	Numerical, quantitative	Narrative, qualitative
Research logic	Theory testing	Theory emerging
Scope and sample	Wide and shallow	Narrow and deep
Nature of data	Hard, reliable Structured	Soft, situational Unstructured
Number of variables	Limited	Broad
Setting	Closed system Artificial	Open system, contextual Natural
Purpose of research	Describe	Explain
Perspective	Researcher	Subject
Proximity of researcher	Distant, independent, etc	Close, involved, emic
Theory	Comes from generalisation	Contextual understanding
Viewpoint	Macro, wide	Micro, narrow

Table 13: Analysis options

Researchers should be wary of the seduction of numbers. Avoid trying to interpret or force data as numbers, and guard against regarding numerical analysis as the 'better' alternative. In many cases it may be wholly inappropriate!

Task 39. Select an analytical approach

Use Table 13 to identify the most suitable analytical approach. Then read the following sections.



13.3 Quantitative analysis

Quantitative analysis involves discovering the characteristics of a set of data through numerical (and usually statistical) analysis. Occurrence, frequency, trends and relationships may all be explored using a host of well-defined techniques and calculations. Rather than reiterate these, this guide will point the student to suitable materials and explain what quantitative analysis should involve and when it is relevant.

Quantitative analysis at undergraduate level should consist of descriptive statistical analysis to examine the properties of concepts, entities and phenomena. If the research is investigating the behaviours of entities, the relationships between entities/concepts or the causality of behaviours/phenomena/events then inferential statistics will be required. Quantitative analysis at a Masters level should involve descriptive and inferential statistical analysis, and pay particular attention to validity and the generalisation of knowledge claims.

According to the Wikipedia:

“Descriptive statistics summarise the population data by describing what was observed in the sample numerically or graphically. Numerical descriptors include mean and standard deviation for continuous data types (like heights or weights), while frequency and percentage are more useful in terms of describing categorical data (like race).”

“Inferential statistics uses patterns in the sample data to draw inferences about the population represented, accounting for randomness. These inferences may take the form of: answering yes/no questions about the data (hypothesis testing), estimating numerical characteristics of the data (estimation), describing associations within the data (correlation), modelling relationships within the data (regression), extrapolation, interpolation, or other modelling techniques like ANOVA, time series, and data mining.”

The purposes of undertaking quantitative analysis include:

- Description.
- Structure.
- Prevalence.
- Prediction.
- Significance.
- Distribution.
- Relationships.
- Grouping.
- Trends.
- Comparison.
- Generalisations.
- Finding gaps.
- Testing hypotheses.
- Evaluation of other research.

Based on Schneider (2005), several stages of quantitative analysis may be identified:

- Clean the data:
 - Ensure it is correct.
 - Record missing data as such.
 - Record null results.
 - Detect and correct invalid values.

- Detect and investigate unusual values and combinations.
- Check outliers.
- Check unexpected distribution patterns.
- Data types are enforced.
- Resolve ambiguities.
- Understand the subjects:
 - Make lists for small data sets.
 - Produce descriptive statistics for each variable.
 - Produce graphics.
- Apply common sense
 - Do these descriptive findings make sense/correlate with hypotheses?
 - Are there anomalies, and can they be explained?
 - Are the figures plausible?
- Make graphics or tables that show relationships
- Design and calculate coefficients:
 - That measure the strength and the structure of a relation.
 - That describe and explain variance.
- Compute significance levels:
 - Make generalisations.
 - Draw conclusions for the questions/hypotheses.

Task 40a. Acquire or refresh your knowledge of statistics



From this long list, it should be apparent that quantitative analysis is not a simple option. In fact, students wishing to use quantitative analysis should not proceed without obtaining a good textbook on statistics, and fully acquaint themselves with statistical techniques.

Bryman and Bell (Chapter 11, pp.232-256) and Collis and Hussey (Chapters 11 and 12, pp. 219-289) provide more information on quantitative data analysis.

Prepare a short section at the beginning of the findings chapter that describes your analytical technique.

- ① Useful tip: Students should use descriptive and interpretive statistics, and interpretive statistics that explore the relationships between variables is usually mandatory at a Masters level.

13.4 Qualitative analysis

Avoiding statistical analysis may now seem appealing, but the requirement to describe and infer is no less rigorous. Thorne (2000) hits the nail on the head in stating:

“Unquestionably, data analysis is the most complex and mysterious of all of the phases of a qualitative project, and the one that receives the least thoughtful discussion in the literature.”

Qualitative analysis involves choices of its own. Analysis may be linear versus iterative, building up a picture rather than arriving at it, and data collection and analysis may be undertaken concurrently. In particular, the iterative nature of grounded theory particularly illustrates this characteristic (Figure 14).

Qualitative analysis has a number of purposes:

- Discovery of patterns and trends.
- Making predictions.
- Finding similarities and differences.
- Revealing underlying structure.
- Distilling the problem into a manageable model.
- Elaborating.
- Looking for meaning.
- Looking for points of tension, conflict, incongruence and inconformity.
- Confirming and refuting positions, theories, existing understanding, old wives tales and scrutinising inferences and claims.
- Interpreting and explaining behaviour.
- Documenting phenomena.
- Codifying tacit knowledge.¹⁴

Woods (2006) recommends the following to qualitative researchers:

- Do not set up artificial experiments.
- Make as few assumptions as possible in advance of the study.
- Context should be considered as influencing parameters, and recorded.
- Lengthy and deep involvement is normally required.
- Achieve a rapport or empathy with the subject.

Thorne (2000) has identified four main cognitive processes inherent in qualitative analysis:

- Comprehending.
- Synthesising.
- Theorising.
- Contextualising.
- ...and I'd like to add creativity!

¹⁴ Tacit knowledge resides in people's heads whilst explicit knowledge is written. Codifying (or writing down) tacit knowledge has proved to be more challenging than researchers expected. An example would be the preparation of a manual that teaches someone to ride a bicycle.

Unlike quantitative analysis, qualitative researchers have a wide variety of analytical techniques at their disposal. These include (from Woods and others):

- Cognitive mapping, mind-mapping and other visualisation.
- Comparative and constant/iterative comparison techniques.
- Confronting emerging understanding with a formalised body of knowledge/literature.
- Content analysis (thematic categorisation and extraction).
- Critical analysis and critical evaluation.
- Formal logic.
- Hypothesising.
- Inductive analysis (categorising, coding, memo-ing, *in vivo* and social coding).
- Interrogatives: What, where, when, which, who, why and how?
- Modelling of entities, relationships, behaviours, properties, phenomena.
- Narrative and discourse analysis.
- Patterns.
- Recursive abstraction, repeated distillation/abstraction.
- Reflection.
- Refutation.
- Restructuring.
- Sense making and comprehension approaches.
- Serendipity.
- Sorting and other forms of organising.

Technology is available too, with various tools that may support the analysis:

- Atlas
- NUD.IST
- nVivo
- CAQDAS and others at <http://www.content-analysis.de/software/qualitative-analysis>

Key points to consider:

- Fine detail can usually be observed and should generally be recognised or discussed.
- Ambiguity and rare phenomena can and in many cases should be recognised (statistical analysis tends to obscure them).
- Generalisations are not as easily demonstrated as quantitative analysis allow.

Since highly methodical calculations are not employed, it is usually expected that the analysis process be documented to help establish validity. Researchers should design their processes to be as methodical, repeatable and consistent as possible; then document the process. Mayring (2000) illustrates this by providing a step-by-step process for qualitative text analysis.

Writing up also differs. Where quantitative analysis may produce graphs, charts and tables, qualitative research will tend to produce narrative discourse in the form of explanations, descriptions and discussions.

Task 40b. Acquire some knowledge of qualitative analysis techniques



If you have chosen qualitative analysis then textbooks and online sources will provide more information on those qualitative techniques in the above list that appear to be useful. Review and practice their use.

Bryman and Bell (Chapter 19, pp.424-443) and Collis and Hussey (2009, pp. 161-183) provide more information on qualitative data analysis.

Prepare a short section at the beginning of the findings chapter that describes your analytical technique. Go into detail about how the data was processed and what the limitations may be.

13.5 Interpreting the data

Making observations is one thing, understanding them is another! The above skills and techniques should now be put to work to build understanding, explanation and prediction. Analysis ultimately has to address the research questions, aims and objectives and research problem. Questions need to be put to the data to establish what it reveals.

Starting with some basic questions, interrogate the data as following:

- What, where, when, which, who, why and how?
- How good is the data?
- Could chance or bias explain the results?
- How do the results compare with those from other studies?
- What theories or mechanisms might account for findings?
- What new hypotheses are suggested?
- What are the research, practice and policy implications?

Questions by Forsyth *et al* (1994) and others suggest more questions to consider:

- What are the independent and dependent variables in the study?
- Were the findings expected, or are they strange or anomalous?
- How do the findings compare to experience?
- How confident are you that the results indicate a relationship between the variables?
- How strong do you think the relationships are?
- How confident are you that the results can be generalised to other subjects/populations?
- How confident are you in the causes?
- How important is it to find relationships and causes?
- What additional information is needed for clearer and more confident interpretation?
- Are multiple realities possible?
- Do the findings confirm or refute the hypotheses or knowledge claims?
- How well did the research achieve the aims and objectives, answer the questions or test the hypotheses?
- Could different techniques or samples achieve different outcomes?

Looking at the principles of synthesis, you will generally find useful information in performing a range of activities like:

- Grouping.
- Categorising.
- Looking for patterns.
- Looking for trends and frequencies.
- Looking for relationships.
- Systemic behaviour.

The wide-ranging nature of these questions demonstrates that analysis and interpretation is a subjective art. It is recommended that students don't undertake analysis on a pressured schedule, and that they allow plenty of time for lateral thinking and for ideas to emerge. Iterative analysis of the data can help too, particularly with qualitative analysis.

Task 41. Interpret the data

Read up on synthesis and interpretation.



Review the questions in this section and start asking questions of the data. Does this tell you anything? Look at the research questions, hypotheses, aims, objectives and body of literature. Is there anything you should be asking of the data to help substantiate your argument or improve your claims?

13.6 Developing theory

One objective of research is to produce theory. Webster and Watson (2002) describe theory as a model with an explanation. Other opinions on the matter include:

"A theory is a set of interrelated principles and definitions that present a systematic view of phenomena by specifying relationships among variables with the purpose of explaining natural phenomena." (Kerlinger 1986)

"Any set of hypotheses or principles linked by logical or mathematical arguments that is advanced to explain an area of empirical reality or type of phenomenon." (Jary & Jary 1995)

And in a more humorous vein...

"Reality is the murder of a beautiful theory by a gang of ugly facts." (Robert Glass, 1996, paraphrasing Huxley)

"In theory there is no difference between theory and practice. In practice there is." (Yogi Berra)

"In theory, practice is simple." (Trygve Reenskaug)

"Theory and reality are only theoretically related." (Robert Grossblatt)

Constructing theory is "one of the final steps of theory development in which the components of the theory are organised and linkages drawn" (McEwen and Wills, 2006, p.74).

Strauss (1987, p263) stated that theory presentation requires a choice between formal theoretical propositions and less formal theoretical discussion, with qualitative researchers tending to write discursively. Discourse is descriptive and interpretive, and will inevitably contain abundant propositions, and may provide fertile ground for further deduction.

Theoretical propositions are on the other hand succinct, consolidated, less dense, less complex, less rich and can give the appearance of being more 'scientific'. Theoretical definitions describe concepts and often include examples explaining how the concept occurs in reality (McEwen and Wills, 2006, p.80); and theoretical statements either claim the existence of phenomena or describe the relationship between concepts.

13.7 Asking questions of the research

Analysis of the data should tell the researcher about the research and the nature of the conclusions. It is worth writing a paragraph or two on each of the following issues as this will help demonstrate the student has thought critically about their research.

13.7.1 The research

Analysis of the data can reveal a substantial amount about the research project itself. Reflect on the research using the following questions as a guide.

- What are the key lessons?
- What opportunities are indicated?
- What are the implications for:
 - The topic?
 - The problem?
 - The aims and objectives?
 - Hypotheses and research questions/problems?
- What do the findings say about:
 - The choice of research type, logic and method?
 - The choice of data?
 - Collection and analysis?
- What does this research offer to:
 - Other researchers in the field?
 - Practitioners?
 - Policy?
 - Student researchers?

Task 42. Reflect and theorise

Consider what your analysis and interpretation of the data has told you. Try to formulate a general explanation and if appropriate, a theory.



13.7.2 Bias

Subjectivity is inevitable given that interpretation involves understanding the findings from the researcher's perspective and using the researcher's knowledge. MacCoun (1998) says, "*Biased research interpretation is a common phenomenon, and an over-determined one, with a variety of intentional, motivational, and purely cognitive determinants.*" He also goes on to say "*Not all biases are indefensible.*"

Every aspect of the research introduces bias. Bias in interpretation should be recognised and described if possible. Researchers should also take steps to limit the bias in interpretation by looking for strong inference or high statistical correlation, applying techniques rigorously, recording outcomes carefully and comparing them objectively.

Task 43. Consider bias and perspective

Read up on the subject of *research bias*. Now reflect on and consider the sources of bias in your research, how they may have been controlled, and what impact that bias had on the research.



13.7.3 Limitations

Every study will have its limitations. These are conditions out of the researcher's control and that affect the scope of the study and/or its outcomes. Addressing the limitations helps avoid unsubstantiated claims, criticism of validity, flaws in the design and even suggest future work. Some may say that a student telling an examiner where the problems lie in their research is counter productive, but actually it is a sign of good critical thinking and an acknowledgement that a dissertation is a learning experience. You will get better marks for discussing limitations than by pretending your work is perfect!

Researchers need to discuss the limitations of the research in a section in the conclusions chapter, and this should examine limitations of the research in the following areas:

- The topic.
- Methodology and method.
- Data sample.
- Data collection.
- Analysis.
- Theory and interpretation
- Overall bias and perspective.

Students commonly make exaggerated claims or invalid generalisations. This is often as a consequence of not wanting to appear tentative, not wishing to (dis)prove their hypothesis, show their questions were flawed, or just not understanding the relationship between sample size and claims. Here are some examples:

- A survey that studied project management students cannot claim the findings now apply to professional project managers.
- Interviews of ten doctors in one city cannot claim to be representative of all doctors in the world, country, state or even the whole city if the sample was not selected properly.
- Empirical observation of 10000 swans in the UK cannot validly support a claim that all swans are white. There are black swans in Australia.

- A detailed case study of practices in one construction organisation cannot make general claims about all construction organisations, even in the same city.

Task 44. Assess the limitations

Read up on the subject of *research limitations*. Consider what limitations apply to your research project and findings. How are you limited and what do you need to learn to make you a better researcher? Include this as a short section in the Conclusions chapter.



13.7.4 Review validity

All aspects of research are susceptible to issues of validity and it is wise to review your work and analyse its quality. Section 8.5 introduced the concept of validity and at this point the entire dissertation should be inspected briefly against the criteria described in Table 12.

Task 45. Assess the validity

Review section 8.5 and evaluate this dissertation research against the criteria in Table 12. Write your findings on validity up in a short section in the Conclusions chapter.



13.8 Write up the findings

Findings may now be written up. The importance of this chapter in your dissertation is enormous. Most of the marks will be earned by this section and the support it gives to the remainder of the document. Findings show how much you have learnt as a researcher and demonstrate your new found skill.

Remember that the findings highlight your ability to communicate concepts and present data and information in a meaningful way. Use tables for lists of data and sort the contents in a meaningful way. Use charts to represent data. Use graphs to show trends and relationships. Be clear and methodical. Include photographs of the context if that is relevant and useful.

Be critical of the subject, the literature and especially of your data and findings. Avoid emotive and persuasive language; this is an analytical chapter and not a creative one. Don't show bias and don't try to draw out findings that are not supported by the data. Compare findings to theory. Relate findings to your questions and hypotheses. Explain any shortcomings and contradictions.

Structure the section well. Use the swim-lane structure described in Section 3.4.1 to help structure the discussion and keep the findings consistently organised. It is imperative that the findings describe and explain what was found in terms of the research questions, hypotheses, literature and the research problem. Do not try to introduce new material in here. Do not try to draw conclusions for the aims and objectives or the topic as these will be left for the Conclusions chapter.

Task 46. Write up the findings

Review a couple of good dissertations. How did they present their findings? Create a heading in your document for each of the hypotheses or research questions, then answer each of these in a concise but comprehensive way. Once complete you can review them and ask yourself the question “Have I answered this question and explained what the data is telling me?”



13.9 Recommended reading

Bryman and Bell (2003)

Collis and Hussey (2009)

Mayring, P. (2000) "Qualitative Content Analysis", *Forum: Qualitative Social Research*, Vol. 1, No. 2, June, available online at <http://qualitative-research.net/fqs/fqs-e/2-00inhalt-e.htm>

Schneider, D. (2005) Quantitative Data Analysis, *TECFA*, online <http://tecfa.unige.ch/guides/methodo/edu-tech/slides/analysis-quant.pdf>

Sowa, JF. Various readings on knowledge representation and modelling, available at www.jfsowa.com/

Thorne, S. (2000) "Data analysis in qualitative research", *Evidence Based Nursing*, Vol. 3, pp. 68-70

Woods, P. (2006) "Qualitative analysis", *Faculty of Education, University of Plymouth*, online at <http://www.edu.plymouth.ac.uk/resined/qualitative%20methods%202/qualrshm.htm>

14 Develop conclusions and recommendations

The conclusion is a summary chapter that draws together the discussions and findings to produce a satisfactory and convincing close to the argument. It is this chapter that will directly address the aims and objectives.

14.1 Conclusions contents

The conclusions chapter should contain a summary of the work and a final comment or judgement on what was discovered. A dissertation conclusion should contain:

- A summary of the dissertation's argument.
- A summary of the key theories, models and debates from literature.
- A summary of the findings.
- Explanation of how these:
 - Address the project aims and objectives.
 - Answer the research problem, questions and/or hypothesis.
 - Compare with theory.
- A statement of the limitations and generalisations.
- Describe theoretical or practical conclusions or solutions for the topic.
- Provide recommendations for research and practice if relevant.
- Summarise the lessons learnt (section 13.7.1).
- Recommendations for future research, although Levine (2010) regards this as *"Potentially the silliest part of the dissertation"*.

14.2 Writing the conclusions

Collis and Hussey (p305) and others offer the following useful advice for writing up the conclusions chapter:

- The conclusion should complement and echo the introduction.
- The introduction starts broadly and becomes focused, whereas the conclusions start focused and becomes broad.
- Start the conclusions chapter by restating the purpose of the research.
- Summarise the body of literature and identify the key theory used.
- Explain where your dissertation fits into or contributes to the broad body of knowledge.
- Summarise what was found in relation to each research question.
- Summarise your theoretical position and hypotheses.
- Summarise the method and questions.
- Summarise findings. Don't leave key relevant questions unanswered.
- Draw only warranted conclusions and leave the vague and weak behind.
- Make sure the points discussed are given weight that is proportional to the discussion of these issues in the dissertation.
- Present your judgement, but recognise that unless this is substantiated with evidence it is only an opinion that is not necessarily informed or authoritative. Do not make overly ambitious, exaggerated claims or sweeping statements. Definitely do not go off topic or launch into pet theories.

- Do not introduce new information.
- Check that the same terms are used to describe things throughout the dissertation.
- Widen the discussion by:
 - Explaining the contribution to knowledge.
 - Referring to gaps and deficiencies in the literature, and discussing how this research has addressed them or why not.
 - Self criticise and describe any lessons learnt. Summarise the shortcomings of bias, limitations and validity. This shows the examiner you are capable of reflection and critical thinking (and the examiner would most likely have already noted these failings anyway).
 - Don't be too modest either. Point out useful and important findings, even if these are not novel.
- End convincingly... but don't be arrogant or make unsubstantiated claims.

It is feasible to start writing the conclusions whilst writing up other chapters of the dissertation, or even write up the conclusions when the introduction is complete! This strategy forces the researcher to think about the final outcomes, and the conclusion can be amended if anything changes anyway. A downside to doing this is that you will have to rewrite much of it.

Don't leave writing conclusions to the last day or two before the dissertation is due. Experience suggests that a dissertation that offers less than a page in conclusions is likely to be uncritical, poorly written and fail. As a worst case example I once received a dissertation offering only a single paragraph in conclusion.

Task 47. Write up the conclusions

Prepare a short list of the things you want to say in the Conclusions. Identify the key point/s for each. Organise the list into an argument or discussion. Now write these points paragraph by paragraph.



- ① Useful tip: If you encountered new literature after you finished writing up your literature review then do not bring it up for the first time in the Conclusion! Does it refute or support your argument, and will it bring you extra marks or improve the quality of your work? If so then add an addendum to the literature review and note in the Conclusion chapter's summary of key theories that this particular literature refutes or supports the findings.
- ① Useful tip: Manchester University offers a useful academic Phrasebank to use in writing up your conclusions (and elsewhere in the dissertation too). The online source may be found in recommended reading.

14.3 Writing the abstract

Even though it is a hangover from the past when technology was not available to assist in literature searches, the abstract still serves a few purposes. It is a précis that readers use to quickly identify suitable work and inform them what to expect. Abstracts are also added to reference collections.

The abstract should contain a brief summary of the dissertation that adheres to the required word count, usually 300 words. It is self-contained and usually does not contain references or

diagrams. In terms of style, the abstract should be well crafted, engage the reader and capture their attention.

- What is the research about? This should be a brief summary of the topic, problem and purpose, and encapsulate the aims and objectives.
- Any key theories or perspectives involved?
- How was the research conducted? This should cover a summary of the nature, logic, method, questions and data.
- What are the findings and implications? This is a summary of the findings and an overview of the conclusions. It may also be useful to mention the value and originality of the research.
- Some courses require keywords. These should be relevant, precise and encapsulate the research.

Problems with abstracts usually involve the abstract being too long or too short, not explaining what the research is about, being too general and not focusing on the specific objectives, and being boring.

Task 48. Write up the abstract

Carefully consider what points to raise in the abstract and what to leave out. Start by writing without worrying about the word count. When you have a working draft containing all you need to say then you can focus on shortening or lengthening it as needed.



14.4 Recommended reading

Manchester University (2012) Academic Phrasebank, *Manchester University*, available online at <http://www.phrasebank.manchester.ac.uk/>

Sharpling, G. (2010) "Writing a conclusion", *Warwick University Centre for Applied Linguistics*, http://www2.warwick.ac.uk/fac/soc/al/learning_english/activities/aez/resources/writing_conclusion/

15 Submission

Although this chapter is largely redundant since the writing up should have been done chapter by chapter, there are some general points worth mentioning when it comes to overall writing and presentation.

15.1 Writing for an audience

A dissertation is usually intended for a small and specialised audience – the examiners. It is worth identifying who this audience are and their expectations. Expectations may be included in the marking schema whilst others may be more subjective or difficult to define. Examples include:

- Preference for tense. There may be a preference for past or present tense, but students are advised to keep it consistent.
- Avoiding first person. Whilst this is perhaps more relevant to research where the researcher is independent of their subject, students reflecting on personal experience may find it unnatural. Be aware that writing in the first person can make an argument look like a journal or series of diary entries.
- Firmness on spelling, grammar and punctuation. With the increasing numbers of foreign students, examiners have tended to be more forgiving of errors. This does not mean that poor writing will be ignored, and if the examiner could not understand what was being said then the student may lose a lot more than the marks allocated to presentation.
- Errors in formal logic. Depending on the subject, course and examiner, errors of logic may be frowned upon. Review the basic principles of logic and try to avoid making major mistakes in your literature review, analysis and conclusions.

It is also worth bearing in mind the examiner's workload:

- Marking is always rushed. A lot of dissertations appear at an inconvenient time like exam season or just before holidays. Students expect rapid turn-around, but this means there is less time to look carefully at the work. One would think this will benefit a lazy student, but actually it works against them as many examiners don't have the patience or capacity to then find any good writing or thinking.
- Due to the nature of many faculties, examiners may not have 'quiet time' to read. Many of my colleagues took work home to mark over television, meaning using their personal time to mark. Poor work is looked upon less sympathetically as a result.
- Due to time pressures, examiners often develop an impression after reading just a few pages of the abstract, title, introduction and conclusions. They will firm up that impression after a quick flip to the references to see how much time the student spent in the library. Thereafter the examiner may only look for material that confirms or refutes that impression.
- Boring topics, poor construction and bad spelling and grammar suck all the joy out of marking. Examiners then try to get through the dissertation quickly without losing the will to live, yet the difficulties mean they have to read slowly.

Put differently, examiners go out of their way to grade dissertations and are very unlikely to be sympathetic if the student has shown little interest. Do the necessary amount of work and pay attention to the details.

15.2 Manage your references

References are the easiest aspect of the dissertation to get right, and the easiest aspect of the dissertation for examiners to find fault with. However they are also one aspect of a dissertation that regularly cost students marks.

Although it may appear pedantic, students must follow simple rules regarding how to format their references. Referencing systems have evolved over time for good reason. Referencing allows specific documents to be located amongst the hundreds of millions published every year. They are a common format that other researchers will be familiar with, multiple references are easier to manage, there are no renumbering issues if sections are changed, save space whilst writing, examiners can quickly inspect, and allow the quality of supporting evidence to be evaluated. However, citations and references can also be distracting, require familiarity with the system, and require effort to manage.

In order to prevent some common referencing issues, students should add a new reference to the References section as soon as it is encountered. This will help resolve forgetting where a particular quote or concept came from and accusations of plagiarism for failing to cite work. Students should remember to alphabetise their references and use the approved system consistently.

Students are advised to consult the university guides for referencing. Some examples include the Leeds Metropolitan University *Skills for Learning* resource called *Quote Unquote* to be found at [http://skillsforlearning.leedsmet.ac.uk/Quote Unquote.pdf](http://skillsforlearning.leedsmet.ac.uk/Quote%20Unquote.pdf). Another example is the DeMontfort University guide at <http://www.library.dmu.ac.uk/Images/Selfstudy/Harvard.pdf>.

15.3 Appendices

The other forms of reference that students may need to include are Appendices. These contain material that is germane to the argument and provides evidence of work, but too bulky or not suitable for inclusion in the Chapter discussions. Typical examples of appendices include: survey questionnaires, observation guides and raw data

Task 49. Check and complete the references and appendices

Open a copy of the university guidelines on Referencing. Review the expected format and ensure every single reference complies. Then sort the references alphabetically according to the first author, preferably using the list sorting function on a wordprocessor to save time.

Check appendices have titles and a short introduction that explains what they are saying and where the discussion may be found in the main body of the dissertation.



15.4 Paying attention to the details

It is now worth reviewing your dissertation to make sure all the little things are complete. These may affect your mark dramatically and yet they can be the easiest and quickest to remedy.

15.4.1 Spelling and grammar

Modern wordprocessors have spelling checkers. It is pure laziness not to use one. In fact, whilst you are reading this, first up your dissertation and do a spell-check!

Modern wordprocessors also have grammar checking, but they are generally not particularly effective. If English is not your first language, pay someone to proof read your dissertation a couple of weeks before it is due. Preferably employ a proofreader or editor who is familiar with the topic or course.

Make sure your use of terminology is consistent, from introduction to conclusions. Use the same words to describe the same things.

15.4.2 Cover page

Faculty and module guidelines usually specify what should appear on the dissertation cover. Follow these guidelines!

Some students are ambitious. Balance attractiveness with functionality. It is unlikely that your marks will be influenced in the slightest by spending 4 days on designing a snazzy cover. That time would be better spent in spelling and grammar checks, writing a better abstract or improving the conclusions.

15.4.3 Contents page

A useful contents page will be short and navigable rather than extensive. As long as everything is in the right (familiar) place, then the reader (examiner) will not need to use the contents to navigate the structure. Some tips:

- No examiner is likely to use contents that are more than a page or so in length.
- Only include the top level (chapters) if there are many chapters with few sections.
- Use two levels (chapters and major sections) if there are few chapters and each chapter has several major sections.
- Only use three levels if there are few chapters and many major and minor sections.

Again, use the functionality built into modern wordprocessors to automatically construct the contents page. This saves the hassle of leaving construction to the last moment, or having to add and rearrange page numbers. Review the tip in section 3.5 and ask your tutor or librarian for assistance in finding out how to build contents pages from Heading styles in a wordprocessor.

15.4.4 Page numbering

Page numbers are essential. Use a simple numerical numbering system and place the numbers in a consistent and visible place. Wordprocessors provide functionality to automatically imprint headers and footers on every page.

15.4.5 Chapters and sections

Start each new chapter on a new page. This makes finding the chapter easier, and improves the presentation.

Use a bold large font for the chapter heading. Use bold fonts and preferably a numbering system for section headings. The settings are probably in the module instructions, but it is worth repeating them.

Since hardly anyone uses a typewriter for preparing dissertations anymore, it would be wise to get familiar with your wordprocessor's basic functions. Some of the problems that are commonly encountered include hitting the ENTER key numerous times to get to the next page. Insert a page break, and adjust the font size to create headings. Ideally use the Style functionality for the various levels of Headings.

15.4.6 Quotations

If you have copied it word-for-word then simply put the phrase in quotation marks and cite the author, year and page. Failing to do so opens you up to accusation of plagiarism. It is also worth noting that no more than perhaps one or two percent of your word count should be quotations.

15.4.7 Diagrams and tables

Diagrams are meant to illustrate; after all a picture is worth a thousand words. Please do not force the examiner to respond with a thousand words to a poor illustration! There are a couple of points to consider:

- A diagram or table is a good way of reducing your word count if that is too high. Convert a list to a table or a lengthy discussion in part into a diagram.
- Diagrams and tables copied off an Internet website get a big fat zero. Recreate them, annotate the copied image or amend it. Always cite the original source in the diagram title.
- Number the diagrams and tables in a consistent and sequential manner.
- Don't build tables using the tab key. Create them using table functionality built into the wordprocessor.
- Discuss the diagram or table in the text, preferably close to the diagram. Explain what it is saying and what it means to the argument. There is nothing worse than being presented with a diagram and not knowing where it belongs or what it refers to.

15.4.8 Printing and binding

Check your module instructions for submission details before printing and binding as mistakes can be costly. Other advice includes:

- Print on normal typing/photocopy paper.
- Do not laminate every page! It makes for an unwieldy document that cannot be written on and is a waste of money.
- Print duplex (double sided) if your faculty or supervisors allow it. It saves money, is easier to carry and post and is better for the environment.
- Print in colour only if it is necessary as it is cheaper not to. If your diagrams or photographs are in colour consider changing them to monochrome.
- Shop around for binding, or ask the faculty or tutors if cheaper spiral or comb bound submissions are acceptable.
- Last moment binding services are great money-spinners for the printers! Don't leave binding till the last hour before the submission deadline.
- Make an electronic version available, but don't include a pouch and CD unless required to do so. Email the electronic copy to the supervisor or tutor instead. You may be asked to submit in a .doc format or a PDF format.
- Retain a copy for yourself. Documents have been known to go missing in the university system, family may want to see what you have been up to for so many months, and you may want to refer back to the work at a later date.

15.5 A final check

Hopefully you have planned your dissertation well, and adhered to the plan. Nevertheless, whether you have a day or week, now is the time to print a copy and read through the dissertation from cover to cover. Use the marking criteria and quality recommendations provided throughout this guide to make sure the work is as good as it possibly can be.

Task 50. Review the dissertation prior to submission

Spend a little time before printing and binding the document. Check that it is the best it can be. Make sure once it is printed and bound that all the pages are there and in order.



15.6 Recommended reading

Gopen, G.D. and Swan, J.A. (1990) "The Science of Scientific Writing", *American Scientist*, Vol. 78, pp550-558

Grabbe, L.L. (2003) The Trials of Being a PhD External Examiner, *Quality Assurance in Education*, Vol. 11 No. 2, pp. 128-133

Leeds Metropolitan University (2012) "Skills for Learning", *Leeds Metropolitan University*, available online at <http://skillsforlearning.leedsmet.ac.uk/index.shtml>

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17 Glossary

Abstract	A brief summary of the research, usually describing what was done, why, how it was done, what was found and what this means.
Analysis	The process of examining and interpreting data to answer the research questions.
Bias	Any influence or factor that affects the research results.
Causality	Where the presence, absence, state or action of one variable or entity has an effect on another.
Critical analysis	A thorough and ideally non-judgemental investigation.
Critical evaluation	A judgement based on a thorough investigation of all aspects of the problem.
Critical thinking	Reasonable, reflective thinking that is focused on deciding what to believe or do.
Data collection	The overall process of preparing, gathering and recording data.
Data	Facts about phenomena and answers to questions that are the result of measurement and which provide evidence to support claims and statements.
Deductive research	Researching from the general to the specific. Theory leads to hypotheses which are tested leading to confirmation.
Discourse	A general term for any discussion, argument, ideas or theory that is presented in a conventional way.
Emic	Studied from the perspective of an insider.
Empirical	Relying on or derived from observation or experiment.
Ethics	Research that follows generally held guidelines and standards about what is responsible, moral, principled, fair and legal.
Etic	Studied from the perspective of an outsider.
Evaluation	A process of judging the value of something, usually in relation to something else like theory, trends or experience.
Evidence	Support for claims and statements. Evidence may include data, other research, logic, mathematical proof and highly regarded opinion.
Generalisability	How representative the sample and findings are of a larger population.
Hypothesis	An (unproven) statement of the relationship between two or more variables or entities.
Inductive research	Where observations lead to analysis, hypotheses and then theory.
Instrument	A tool or technique used to collect data.
Interrogatives	Seven general questions used in analysis to examine a problem and its elements. These are what, where, when, which, who, why and how.
<i>In-vivo</i> terminology	Terms used by an author, expert or respondent, using their words.

Literature review	A summary of the literature relevant to the topic, and the process of selecting, reading, critically analysing and evaluating the topic's body of knowledge.
Literature search	The process of identifying literature appropriate to the topic.
Measurement	The generation of data.
Method	A specific process used to execute the research, like data collection method or data analysis method.
Methodology	The strategy or entire process of how the research will be conducted.
Narrow and deep	The scope of a research investigation where a few subjects provide detailed data.
Paradigm	A viewpoint or perspective that governs the way a researcher looks at and researches the problem and the subjects.
Phenomenon	An occurrence, observable event, behaviour, experience, outcome or trend.
Population	The entire universe of all possible cases. This can be constrained by the student, such as in saying "the population is all teachers in Wales."
Qualitative research	Investigation using non-numerical data.
Quantitative research	Investigation that uses numerical data.
Reliability	Can another researcher produce the same results using the same methodology?
Research strategy	(see Methodology).
Research	The process of investigating a problem with an aim to understanding it and achieving an outcome.
Response rate	The percentage of participants in the sample who responded to the survey or other instrument.
Risk	The probability and impact of any harm that the research can do.
Sample	A subset of the population, ideally one that is representative of that population.
Sampling	The process of choosing a sample from the population.
Theory	A general explanation of a phenomenon.
Triangulation	Use of multiple methods to double check results and increase the credibility of results or produce a more balanced picture.
Validity	The best available approximation to the truth of a given proposition, inference, or conclusion.
Wide and shallow	The scope of a research investigation where many subjects provide a simple set of data.

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19 Appendix I: Marking schema

19.1 A simple marking scheme

Student		Title	
Supervisor		Second Reader	
ASSESSMENT		COMMENTS, marks from: 30%	
PROBLEM/ISSUE SPECIFICATION Very clear specification of the problems with reason and purpose of the research unambiguously stated.			
METHODOLOGY Theoretical framework(s) clearly identified and justified. Problem expressed as a challenging research question, hypothesis, or speculative conjecture. Methods of analysis clearly identified and justified.			
LITERATURE REVIEW Comprehensive and critical review of the literature. Identifies key issues and arguments within the research field. Review presented as a sustained discussion of relevant material. Shows how the literature is used to the development of the dissertation.			
ASSESSMENT		COMMENTS, marks from: 60%	
ARGUMENT AND EVIDENCE Structure of the argument clearly defined. Argument coherently and validly sustained throughout. Weakness in the argument acknowledged through critical evaluation of (fully referenced) evidence. Evidence is relevant to the argument. Clear conclusions and recommendations based on the evidence provided.			
REFERENCING AND BIBLIOGRAPHY Accurate use of the Harvard System.			
ASSESSMENT		COMMENTS, marks from: 10%	
PRESENTATION Lucidly, concisely, and accurately written. Visually stimulating.			

OTHER COMMENTS

--

--

% Total Mark

19.2 A detailed marking scheme

Collis and Hussey (2009, p.12) provide an indicative structure and marking schema for a dissertation or thesis. Note that the relative weighting for each section may vary according to the level (Bachelors or Masters) as the emphasis changes.

Chapter	Title	% of report
1	Introduction	10%
	The research problem or issue The purpose of the study Background to the study and why it is important or of interest Structure of the remainder of the dissertation	
2	Review of the literature	30%
	Evaluation of the existing body of knowledge on the subject Theoretical framework (if applicable) Links to research background, problem, questions and/or hypothesis	
3	Methodology	20%
	Identification of paradigm Justification for choice of methodology and method Limitations of the research design	
4	Findings/Results	30%
	Presentation and discussion of the analysis	
5	Conclusions	10%
	Summary of what was found in relation to research questions Contribution to knowledge Limitations and suggestions for future research Implications of the research and findings for practice or policy	
References		
	A detailed alphabetical list of all sources cited	
Appendices		
	Detailed data referred to in the text, but not shown elsewhere	

19.3 An exhaustive marking scheme

Student _____ Marking date _____
 Supervisor _____ Second reader _____
 Title _____

Criteria	Excellent	Good	Average	Insufficient	Poor	Comments
Abstract						
1 Is the abstract brief, concise, accurate and engaging?						
2 Does the abstract summarise the dissertation effectively?						
Background and introduction						
3 Is the introduction relevant and engaging?						
4 Has the student rationalised/identified the problem in literature?						
5 Does the introduction provide a strong case for the research?						
Problem specification						
6 Is the purpose/problem statement clearly articulated?						
7 Are the aims and objectives clear, succinct and feasible?						
8 Is the study relevant to the course, student and subject?						
9 Is the study significant and topical?						
10 Is the study, approach or subject original?						
Literature review						
11 Is the quantity of literature reviewed appropriate?						
12 Is the quality of literature suitable?						
13 Is the literature relevant to this research, aims and objectives?						
14 Consideration of key contemporary thinking, arguments, positions						
15 Critical thinking, analysis and contrasting of the key positions						
16 Is the review structured and does the discussion flow logically?						
17 Does the review arrive at a relevant position or question?						
18 Is the literature review well written?						
Methodology						
19 Understanding of methodology, methods and data collection?						
20 Is the choice of method informed and substantiated?						
21 Has an appropriate methodology been chosen?						
22 Have prior research methods and paradigms been considered?						
23 Is the method clearly explained and justified?						
24 Are the questions/investigation areas clear and justified?						
25 Will questions/investigation convincingly address the objectives?						
26 Has the sample and its selection been justified and evaluated?						
27 Has validity been considered?						
28 Have generalisations and limitations been considered?						
29 Creativity and application						
30 Is the methodology section well written?						
Findings and analysis						

31	Are sample and population clearly reported?	☐	☐	☐	☐	☐
32	Is data thoroughly and accurately reported?	☐	☐	☐	☐	☐
33	Is data well presented?	☐	☐	☐	☐	☐
34	Has appropriate and sufficient analysis been performed?	☐	☐	☐	☐	☐
35	Are findings (results of analysis) thoroughly/accurately reported?	☐	☐	☐	☐	☐
36	Are findings well presented?	☐	☐	☐	☐	☐
37	Are findings critiqued/compared to findings/positions in literature?	☐	☐	☐	☐	☐
38	Are findings relevant and explicitly linked to questions/objectives?	☐	☐	☐	☐	☐
39	Robustness of interpretation, analysis	☐	☐	☐	☐	☐
40	Are the findings and analysis sections well written?	☐	☐	☐	☐	☐

Conclusions						
41	Do conclusions provide a succinct summary?	☐	☐	☐	☐	☐
42	Is any new material introduced in the conclusions?	☐	☐	☐	☐	☐
43	Do conclusions bring together and argue research and literature?	☐	☐	☐	☐	☐
44	Are aims and objectives, questions convincingly answered?	☐	☐	☐	☐	☐
45	Are outcomes clearly articulated?	☐	☐	☐	☐	☐
46	Are the conclusions valid?	☐	☐	☐	☐	☐
47	Draw appropriate recommendations for research and/or practice?	☐	☐	☐	☐	☐

Referencing						
48	Range, volume, strength and relevance of literature used	☐	☐	☐	☐	☐
49	Does the student use Harvard Referencing as per Quote Unquote	☐	☐	☐	☐	☐
50	Missing references	☐	☐	☐	☐	☐
51	Quality of citations	☐	☐	☐	☐	☐

Presentation						
52	Is the structure and format of the dissertation clear and effective?	☐	☐	☐	☐	☐
53	Does the structure present a logical flowing argument?	☐	☐	☐	☐	☐
54	Are tables and contents accurate and comprehensive?	☐	☐	☐	☐	☐
55	Page, chapter, heading, section and figure numbers consistent?	☐	☐	☐	☐	☐
56	Are headings and titles of figures etc appropriate and accurate?	☐	☐	☐	☐	☐
57	Are there inconsistent fonts?	☐	☐	☐	☐	☐
58	Has the dissertation been checked for plagiarism?	☐	☐	☐	☐	☐
59	Are names and proper nouns capitalised?	☐	☐	☐	☐	☐
60	Are there spelling mistakes that could be trapped by spell-check?	☐	☐	☐	☐	☐
61	Are there an unacceptable number of grammatical errors?	☐	☐	☐	☐	☐
62	Is the use of terminology accurate, colloquialisms minimised?	☐	☐	☐	☐	☐
63	Binding and overall appearance	☐	☐	☐	☐	☐

Supervision						
64	Has the student regularly and effectively attended supervision?	☐	☐	☐	☐	☐
65	Has the student considered and applied the advice given?	☐	☐	☐	☐	☐

Other comments						
-----------------------	--	--	--	--	--	--

1st reader total		%		name	date	
2nd reader total		%		name	date	
Final agreed mark		%				

20 Appendix 2: Template dissertation supervision record

Student		Dissertation Title		Target Completion Date	
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	Milestone	Planned Delivery Date	Actual Completion Date	RAG Status ¹⁵	Feedback and actions
1.	Introduction				
	Background				
	Aims and Objectives				
	Outline dissertation structure				
2.	Research Methodology				
	Research Methods				
3.	Literature Review				
	Hypothesis/summary/theoretical model				
4.	Findings				
	Analysis/interpretation of findings				
5.	Conclusions				
	Recommendations				
6.	References				

¹⁵ Green = on track, Amber = at risk of being late or poor quality, Red = late or bad quality.

21 Appendix 3: Choices using research assumptions

Area	Dimension	Options	Form of research									Logic		Methods									
			Description	Experimentation	Explanation	Exploration	Problem solving	Proving	Reflection	Change	Testing	Deductive	Inductive	Action research	Case study	Content analysis	Critical reflection	Delphi	Document analysis	Experimentation	Grounded theory	Structured observation	Survey
Researcher	Relationship with subject	Emic, or insider	✓		✓	✓	✓		✓	✓			✓	✓	✓	✓		✓		✓			
		Etic, or outsider	✓	✓	✓		✓	✓				✓	✓		✓	✓		✓	✓	✓	✓	✓	✓
	Bias	The researcher has no bias	✓	✓	✓	✓	✓			✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		The researcher has a strong bias			✓		✓			✓	✓			✓	✓		✓						
	Personal circumstances	Will affect the research				✓			✓	✓		✓	✓	✓		✓		✓					
		Will not have an effect	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Skills	Inexperienced researcher	✓	✓	✓	✓						✓			✓	✓	✓	✓	✓	✓		✓	✓
Nature of the investigation		Wide and shallow	✓	✓		✓		✓			✓	✓				✓		✓	✓			✓	
		Narrow and deep			✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓		
Subject	Nature of the subject	Physical	✓	✓	✓	✓		✓			✓	✓							✓		✓		
		Social	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	
	Ability to engage with the subject	Deep involvement	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓	✓				✓			
		No engagement	✓	✓				✓				✓	✓			✓		✓	✓	✓	✓	✓	
	Scope	Broad	✓	✓		✓		✓				✓				✓		✓			✓	✓	
		Narrow	✓		✓	✓	✓			✓	✓	✓	✓		✓	✓			✓	✓	✓		
		Singular			✓		✓		✓	✓	✓		✓	✓		✓							
	Location	Widespread	✓			✓		✓			✓	✓				✓		✓				✓	
		Narrow, single location		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓		
	Complexity	Complex	✓		✓	✓	✓		✓	✓			✓	✓	✓	✓	✓			✓	✓		
Simple		✓	✓				✓			✓	✓						✓	✓		✓	✓		

Data analysis	Nature of the analysis	Quantitative (statistical)	✓	✓		✓		✓		✓	✓	✓		✓	✓		✓	✓		✓	✓
		Qualitative	✓		✓	✓	✓		✓	✓		✓	✓	✓	✓		✓	✓		✓	✓
	Values	Data is value bound			✓				✓	✓			✓	✓	✓	✓		✓	✓		✓
		Data is not value bound	✓	✓	✓	✓	✓	✓			✓	✓	✓		✓	✓		✓	✓	✓	✓
Nature of the data	Type of data	Numerical, quantitative	✓	✓	✓			✓			✓	✓	✓			✓			✓	✓	✓
		Narrative, qualitative	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
	Quantity of data	Plenty (perhaps 30+)	✓	✓				✓			✓	✓				✓			✓	✓	✓
		A few (perhaps 3-30)	✓			✓	✓				✓	✓	✓	✓		✓	✓			✓	✓
		One or two cases or subjects				✓	✓	✓		✓	✓			✓	✓	✓	✓				
	Complexity	Simple	✓	✓				✓			✓	✓				✓			✓	✓	✓
		Complex	✓			✓	✓	✓		✓	✓			✓	✓	✓	✓	✓		✓	✓
	Context	Data is independent of context	✓	✓			✓		✓			✓	✓				✓		✓	✓	✓
		Data is context bound				✓	✓	✓		✓	✓	✓		✓	✓	✓	✓			✓	✓
	Values	Data is value bound	✓			✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓		✓
Data is not value bound				✓		✓	✓	✓			✓	✓			✓	✓	✓		✓	✓	
Data collection	Accessibility of the data	Easy to access	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Difficult to access				✓	✓	✓			✓			✓	✓	✓	✓			✓	
	Familiarity with subjects	Researcher is familiar	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
		Researcher is not familiar	✓			✓	✓					✓	✓				✓				✓
	Ethical issues	No issues	✓	✓	✓	✓	✓	✓				✓	✓	✓			✓		✓	✓	✓
		There are ethical issues	✓			✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
	Context	Experimental, laboratory, desk	✓	✓				✓				✓	✓				✓			✓	
		Field, independent of context	✓	✓			✓		✓			✓	✓	✓			✓				✓
Field, dependent on context		✓			✓	✓	✓		✓	✓			✓	✓	✓		✓	✓		✓	
Theory	Ability to produce theory	Theory can be produced	✓	✓	✓	✓		✓	✓		✓	✓	✓		✓		✓	✓	✓	✓	✓
		Practical recommendations preferred				✓		✓	✓	✓			✓	✓	✓	✓	✓			✓	✓
	Amount of generalisation	Generalisation is usually required			✓			✓			✓	✓	✓			✓			✓	✓	✓
		Generalisation is not required	✓			✓	✓	✓		✓	✓			✓	✓		✓	✓		✓	
	Purpose of the theory	Prediction			✓			✓	✓		✓					✓		✓		✓	
		Explanation				✓		✓		✓	✓		✓	✓	✓	✓	✓	✓		✓	✓
		Description, modelling	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Application of the theory	Prescriptive of how things should be	✓	✓			✓		✓			✓	✓				✓		✓	✓		
	Change/improvement	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓				
	Descriptive of the current situation	✓			✓	✓			✓	✓			✓		✓	✓	✓	✓	✓	✓	✓

Table A3: Research choices based on assumption

22 Appendix 4: Questions and Answers

I have been asked many questions as a module tutor, supervisor and examiner. A number of the more frequently asked questions are provided here along with brief answers to point students in the right direction. The usual disclaimer applies as for most decisions in student research: consult with your supervisor or module tutor for the definitive answer!

22.1 Topic

Q. How original should my research be?

A. Research at undergraduate and Masters level is not required to contribute anything to the field. Refer to tables 1 and 2 for more information.

Q. I cannot find a suitable/acceptable topic!

A. After reading the discussion in Chapter 5 you should be able to choose a topic. If your tutor or supervisor does not approve of the topic you should ask why, take that advice into consideration, prepare a few alternatives that address their concerns, and ask whether these alternatives are suitable or how to modify them so that they are accepted.

Q. Can I research my employer?

A. Yes. The workplace can be a rich and interesting research environment with loads of data, lots of insights and data that is easy to access. You should discuss this with your tutor or supervisor, consider the various ethics and confidentiality issues, and then approach your employer.

Q. I have failed the research module. What do I do?

A. Your first course of action will be to consult with the expert. Make an appointment with your research module tutor, discuss the problem and take notes on all their points. Discuss with them how to remedy the situation, and agree on an action plan.

22.2 Supervision

Q. How often should I meet with my supervisor?

A. there is no standard replay to this question. A general guide would be an introductory meeting, a second meeting to clarify the project schedule, dissertation structure and direction, then one meeting per chapter, and two final meetings to wrap up.

Q. How do I manage poor supervision?

A. There is no formula for supervision, and supervisors are individuals who will work in their own particular way. First you have to establish whether the supervisor is doing anything wrong according to the university handbook. Check the points made in section 4.1. Consult the university documentation and make sure they are “*at fault*”. Make a careful note of what you are expecting them to do and of how they are falling short of your expectations. Have you made appointments, arrived on time and done the work as asked? If you are still unhappy, it is recommended that you approach your supervisor and discuss the matter. Don’t be aggressive or accusatory, and ask them for their help in clearing up your expectations. If this does not help, then there are a number of routes you may take. You could speak to the module tutor and ask them to clarify the responsibilities of each party. You could also speak to your personal tutor about how to resolve the situation. As a last resort you could ask the module tutor to point you to the right senior academic or administrator who can resolve the situation or assign you another supervisor. Bear in mind this is a difficult situation that involves academic

judgement, personalities, organisation politics, people's careers and a host of other factors.

22.3 Reviewing literature

Q. I cannot find relevant literature?

A. It is highly unlikely that you are investigating a topic that has never been researched before. Please refer to section 6.2 for further information.

Q. What do I do if I have just read something new (and my project is nearly complete)?

A. New theory and debate can emerge as you are approaching the end of your project. If this new literature is relevant in any way then first include it in the literature review. If the theory should have influenced your research questions then discuss in the findings and conclusion how this knowledge emerged at a late stage and how this should/could have been incorporated. If the material is contradictory of your hypotheses or results, then critically evaluate how this relates to your findings in the conclusions. Make sure however that you first review the literature or theory in the literature review. Do not introduce new material in the findings or conclusions. Remember the swim lanes (Figure 2, section 3.4.1).

Q. How many references do I need?

A. There is no definite answer to this because it will depend on your topic, the amount of literature published and other factors. As a general guide you should have a good mix of books and journal articles from the last five years, some web sites and have covered the major theories and debates relevant to your topic. That said, anything less than a full page of references is probably too little and anything over three pages would raise concerns that the student didn't actually read all of them (unless this includes a lot of websites or short articles). Likewise, as an examiner I would be concerned if there were no websites cited, or if more than a third of the references were to websites. It depends!

22.4 Data collection and analysis

Q. How do I come up with questions?

A. I have encountered a lot of research and survey questions that were weak and of no probative value. Improving the quality of research questions will generally improve an overall mark by 5% or more, so it is worth the effort. Unfortunately there is no easy answer because questions lie at the heart of your ability to analyse.

One suggestion that may or may not be suitable depending on your topic and method would be to look at the topic as a system. Model it into its simplest components. Break the topic, objectives and problem down into smaller pieces. Use the six interrogatives of *what*, *why*, *where*, *when*, *who* and *how* to examine the components. Try to ask questions that find out what each component is and how it works. Look for relationships between the components in the system. Describe each relationship and test it for causality. This will generate a long list of questions. Now work backwards. Narrow the list of questions by asking yourself "*how can I investigate this topic and the research problem/s most effectively?*" Choose questions that will produce the best possible explanatory and dig the deepest into the problem.

Q. Where can I find survey respondents?

A. Students, and in particular international students, can experience difficulties in finding respondents to send their surveys to. Choice of topic will have a strong influence on the statistical population and sample, as well as on the response rate. Students should be asking the question "*how can I research this topic?*" at the proposal stage and tutors should be rejecting proposals that don't adequately address this question.

A couple of points about online surveys. First, free online surveys usually have a limited number of questions, so students reduce the number of questions to the barest minimum. In every single case that I have seen the result is poor research and invalid conclusions. Second, you will need to publish the survey link and give people a reason for going there. A good response rate will be 5% and some surveys have had no responses.

If you are asking this question a month away from submission and have had no responses to your survey then you will have to immediately alter your research strategy to investigate the topic amongst your fellow students. Change the questions accordingly, change the methodology and when writing up explain the problem and draw conclusions based on a study of students. The results for example cannot be generalised to a wide population and should only be regarded as indicative of the population that the sample represents.

Q. Can I make up data (and will the examiners find out)?

A. No, and yes. It is better to say you have had no respondents and explain why than to falsify a single response (or experiment result). Examiners can tell on the basis of experience, the randomisation of the results or lack of it, the responses given and the profile of the respondents. Examiners may also ask for raw data if they are concerned.

Q. Can I change my questions or survey?

A. Check with your supervisor first as it is courteous and the research risk assessment and ethics forms may have to be altered and reapproved. If you do change it and anything goes wrong the university and supervisor will not accept liability. Furthermore, supervisors don't appreciate the problems that can arise and examiners can reject your dissertation if it is not properly administered.

Q. What can I do if I am not good with statistics?

A. There are several options available to you. You could try to learn the basics which will serve you in good stead now and in the future. You could try to find similar dissertations in the library and identify how they analysed their data. There are also a wide variety of template statistics solutions for your favourite spreadsheet to be found on the Internet. You could ask a maths student to help you design the tool (and mention their involvement in your acknowledgements and research method chapter. Or you could choose a qualitative research method that generates data that can be analysed in other ways.

22.5 Writing up

Q. Do I use generic headings or can I be creative?

A. Some supervisors and examiners require generic headings and others allow subject or discussion-related headings. Ultimately this becomes a balance between readability, familiarity and creativity.

Q. How many words should there be in each chapter?

A. On the one hand the answer to this question should be "*as many as are necessary to fulfil the purpose of that chapter*". On the other hand some see an advantage to a series of equally sized chapters. Patrick Dunleavy suggests in his well-regarded book "Authoring a PhD" that students aim for 8 chapters of 10000 words each. That word count does not apply to undergraduate and Masters dissertations, but the principle remains. It may be more prudent to check your assessment breakdown (discussed in section 2.3.1) for the allocation of marks and use this to guide the number of words in your chapter outline (section 3.4).

Q. How many words should I write?

- A. Your module information will indicate the word limit. Some examiners are very strict on word limits, and will penalise students for anything more than 10% over (and sometimes under) the word limit. Others are more lenient. Words over the limit are either wasted, indicate you do not get to the point, or that the scope of the research was too ambitious. Words under the limit indicate insufficient effort or too narrow scope. If you are over the limit then edit carefully, perhaps convert a large explanation or two into a diagram and check for irrelevant or repeated discussion. If you are way under the limit then the quickest remedies will be to expand on your literature review, analysis, interpretation, conclusions or recommendations.
- Q. How many words should there be in an abstract?**
- A. A good rule is 100 to 300 words, or no more than a page. Refer to Chapter 14.
- Q. Can I use an editor or friend to check my work?**
- A. The answer will depend on your university. In most cases a student will be allowed to pass their completed work to a third party who will correct their spelling and grammar but not materially change the work or add content. Students should rather try to improve the standard of their English and use the spelling and grammar checking functions of their wordprocessor.
- Q. How many typos am I allowed?**
- A. The answer will depend on your university and your examiners. UK Universities have recently attracted a great many international students and have therefore had to accommodate varying language ability. Use the spelling and grammar checker in your wordprocessor to pick up the obvious mistakes, and leave the last two days before submitting your work for reviewing and correcting.

22.6 Submission

- Q. Can I give up before submitting?**
- A. Yes, you can but abandoning your dissertation at most means accepting a diploma or certificate rather than a degree. Your career and self confidence will probably be affected, so don't give up!
- Q. Can I submit my dissertation without my supervisor's approval?**
- A. You may be able to at most Universities, but think carefully before doing so. Your supervisor can 'trap' a lot of errors and prevent you from submitting work that is bound to fail, and they will almost certainly know the examiners. Prepare a list of your reasons for wanting to do this, analyse them carefully to determine whether your motives are valid and based on fact or emotion, and then approach your research module tutor for advice.
- Q. My dissertation has failed a plagiarism test?**
- A. Tools like Turn-It-In are not infallible, but they will give your examiners a good indication of why your dissertation was flagged as plagiarised. If you did not plagiarise then you should argue your case. It will help if you have evidence like regularly attending supervision meetings so your supervisor could see how you developed your research. However if you did plagiarise or cheat in some way then don't plead innocence. Your examiners will spot the lies and wasting their time will not help you.

Taming the Dragon

A Practical Guide to Dissertations

Patrick Onions

Leeds

2012

This book provides undergraduate and Masters students in the United Kingdom with an easily digestible guide to completing their dissertations. The approach taken is intended to be pragmatic and process-centred, rather than the concept-centric approach offered by many research textbooks. Fifty straightforward tasks take the student from topic selection to final submission. Each step includes clear descriptions, choices that are simplified and explained, a wealth of ideas and suggestions, and recommended literature.

This book is available from the author or Electron Journal free of charge for educational use.