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Quality Assurance of Master's Theses		Master's Degree Handbook
		Else Askerøi

This handbook focuses on what and how to communicate with readers through a master's thesis and on the relationships between content, form and evaluation as well as on scientific ways of thinking. Consistent and thorough preparation and editing of the manuscript will increase readability and lend more weight to the scientific content. Suggestions for quality assuring scientific texts; general rules, useful tips, checklists for editing and requirements to textual content are provided and considered in relation to international evaluation criteria for master degrees from 2003. Whether writing a project report or a master's thesis, it is well worth using these guidelines actively, right from the start. Ongoing quality assurance of the manuscript will allow more time to focus on textual content rather than having to make extensive revisions immediately prior to submission deadline.

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Relationship between

- **Form**
- **Content**
- **Evaluation**

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Foreword

The purpose of this handbook is to give students in higher education a practical tool for handling the relationship between content, form and evaluation in their written work. Compared with previous graduate programmes, master's degree programmes now contain new evaluation methods and scientific requirements to conducting and documenting R&D work. For most students this "apprenticeship piece" represents their first major piece of independent research.

In order to be able to assure the quality of their master's thesis, students need to know how they are assessed in terms of requirements to both content and layout. Moreover, examiners need to have a unified understanding of the prevailing assessment criteria. This handbook therefore presents the principle criteria on which tutors, supervisors and examiners base their supervision and assessment of master's theses.

Graduate students assessed and used the draft version of the first edition of this handbook which was published in 2003. It was then further developed according to their needs and feedback and discussed and assessed by teachers of higher degree courses and higher education, examiners and research fellows. Special thanks were extended to external consultant Astrid Halse, Lillehammer University College (LUC), and to my colleagues at Akershus University College (AUC), Kari Sundsbø Møllen, Mette Høie, Içara da Silva Holmesland and Wilfred Wasenden. The feedback I received in 2003 demonstrates yet again how important it is to collaborate with good readers and users who provide comments during the writing process. In this second edition I would also like to thank June Tolsby, my successor as editor in 2009 of the university college's publication series, for her inspiring and useful contributions.

After the first edition was published students at AUC were recommended to use the APA style in all their written academic work. The difference between this edition and the 2003 edition lies first and foremost in the use of the APA style of managing references. Furthermore, this edition and the second edition have been updated with some new references, practical solutions and linguistic definitions – issues that become so obvious in retrospect!

This version in English is based on the second edition of the Norwegian version published in 2009. Consequently, references to useful literature in Norwegian are included. Students can seek further advice from our library at AUC or from local sources for similar content.

Oslo 2009
Else Askerøi

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The following should also be included here:

List of tables

- if more than three tables

List of figures

- if more than three figures

List of abbreviations

APA style = style sheet for the layout of research documentation (see reference list)

ECTS =European Credit Transfer System. Used to translate and convert examinations and examination results, comparing and interpreting different courses of study, grading systems, grades and converting credits from different countries (see Evaluation).

R&D work = research and development work

AUC = Akershus University College (Høgskolen i Akershus (HiAk)

URL = Uniform Resource Locator

List of Appendixes

Appendix 1: Creating Reference Lists

1. Introduction

”The paradox of learning to design carries with it a predicament. For the student, having to plunge into doing – without knowing, in essential ways, what one needs to learn– provokes feelings of loss. Except in rare cases, students experience a loss of control, competence and confidence; and with these losses come feelings of vulnerability and enforced dependency” (Schön, 1987: 166).

Research demands that the work that is done is both sufficient and correct. Research work is an independent and sometimes lonely process, but single-handedly investigating a topic that interests you can also give a lot of pleasure. In order to sustain motivation, work satisfaction and confidence in your own abilities, it can be useful to work systematically right from the start of your studies, something which is described in detail this handbook. In the master’s thesis it is important to win the support of the reader by ensuring that the content and form meet the requirements of the genre and that the researcher’s ideas and assessments can be followed throughout the entire piece of work.

The main message here is that there is no definitive recipe for how to organise a master’s thesis, but there are some fundamental rules regarding form (editing, layout) and content (scientific requirements) of academic texts with which students ought to be familiar. This handbook deals with ways of assuring the quality of a master’s thesis by analyzing the relationship between evaluation criteria, form and content. I will also provide some personal tips, general rules that are useful to know and checklists to serve as reminders of what is important to evaluate in your own work. The checklists highlight issues in your manuscript which you should consider and the rules highlight issues that you are advised to comply with.

The appearance and content of the master’s thesis give the reader an overall impression of the quality. Which skills are considered important when writing academic texts will vary between disciplines, educational institutions and countries. It is therefore important to compare the information provided here with the course curricula and information provided by the individual places of study. It is easiest to use this handbook if you use it actively and consider the suggestions on the basis of your personal needs and the local requirements.

All the same, it is the student that decides the level of his/her own scientific work. Supervisors and others involved in the process can only act on whatever the individual student produces through challenging, supporting, cautioning, praising and raising questions along the way. Likewise, this handbook can provide suggestions on how the work can be planned and the quality assured, though using it alone cannot guarantee results. Organising your written work throughout the course of your studies can however be assisted and made easier by using this handbook right from the start. If you make consistent choices and already have a good command of form from your bachelor level studies, it will be easier to concentrate on the scientific requirements to content when you embark on the work to be done on your master's thesis. In addition, it is worthwhile investing in good and practical solutions on your PC at an early stage in the writing process. The tips I provide regarding the use of PCs have been selected on the basis of questions that are frequently asked by students.

One thing this handbook does not deal with is the writing process, apart from one heartfelt piece of advice: because we often do not know what we are going to write about before we have formulated our thoughts, you should start writing as soon as the first idea for your master's thesis pops up. We do not know what the result will be before we start; we must rely on the assumption that ideas will evolve in line with the reading and writing processes. Writing will in itself trigger new thoughts and questions, and re-reading your own work and getting feedback from others will provide a multitude of perspectives on what you are writing about. Continuous writing can also be a matter of drafting a preliminary outline, adding notes and evaluating the theory you are reading about, referring to and writing the reference list, preparing a work plan, formulating ideas, drafts or notes on what is going on in the research process (research log) or anything that you may subsequently have to write about in detail or that helps you to maintain an overview along the way.

There are many sources where you can find suggestions and insights. First and foremost, giving and receiving feedback to/from others by collaborating with fellow students and supervisors is invaluable to the research process. A small network of suitable discussion partners and readers is also well worth looking for.

Information on writing and organising master's theses can be found in books and on the internet (refer also to the reference list). It can be wise to refer to these for both study techniques and the actual writing process in order to get some ideas on how to structure a text. See for example Hoel (1992), Lie (1995) and Dysthe and Samara (2006). When it comes to organising project reports, Halvorsen (2001), Redman (2001) and Rognsaa (2003) offer some useful suggestions, and Førland (1996) discusses completing texts with a focus on the discussion.

By using examples from case studies in master's theses (MEd) and doctoral theses (PhD) in education, Bell and Opie (2002) considers the consequences of different methodical approaches. Examples of the consequences of using different research methods are also given in Howe et al. (2005). Research strategies and the choices they entail are presented in Marshall and Rossman (1989) and Stene (1999). Holme and Solvang (1996) offer advice on research approaches and documentation.

It is presumed that research methods will be dealt with as part of your studies. Here emphasis is given to how texts can be structured and edited and what you should be familiar with in order to meet important scientific requirements.

For readers who are particularly interested in punctuation, see for example Truss (2003) for discussions on the complexity of many of these rules.

You will often be able to get help on finding suitable databases within your discipline and tips on searching for literature on the internet at the library at your place of study. You will also find guidance on using other study techniques such as mnemonics (memory aids) or mind maps as tools for organising and developing your mind power in Buzan (1977). These are work methods which are still widely used today (see also Tracy (2002)).

Reliable and good management of references is important for masters students. The software programmes EndNote, Reference Manager and Ref Works will automatically enter and format references and reference lists directly in Word. You can also create your own searchable and editable reference databases and search for references from many online libraries and catalogues. This assures masters students that all the literature references are correctly cited and comply with the chosen style for your references (as in this text, APA 2001). Most of us can benefit from taking a course in how these programmes work. Find out if your place of study offers courses for masters students (like those offered at AUC).

Personal experience has taught me that starting off by presenting your material in an as integrated and consistent way as possible can save a lot of work on revising a thesis before final submission. This relates to everything from choosing layout (the form of written presentation), organising and arranging your material into headings and subheadings, referencing sources, making corrections to anything that must be amended, removing errors and compiling the reference list methodically.

It is advisable to constantly edit the content according to the degree of significance and to whether your arguments represent a scientific approach. Who are you writing for? Your work will not only be assessed by supervi-

sors and examiners; you should also have other readers in mind. Who do you envisage will read your R&D work, and do you have them in mind as you are writing? The challenge is to help readers who, using their individual cultural backgrounds, must decode and interpret what you have written. Who are you, and on what basis of understanding are you conveying your insights?

8 Continuous quality control of your text will sharpen your presentation skills and establish a structure early on in the process that will make it easier for other readers and your supervisor to relate to your drafts. Not least, continuous preparatory work will pay off in the final phase, where one is more concentrated on aspects of content and logic in the text rather than on details of presentation. The examples I provide are intended to aid the work on making conscious choices and also to provide a basis for developing written work for a master's thesis.

Researchers from different environments use different standards for text revision and layout. Although the fundamental scientific requirements are similar, different standards apply for publication within different disciplinary conventions. In this second edition we comply with APA (2001) with respect to handling references.

Because there is no absolute and universal standard for the layout of master's theses or for references and reference lists, you must obtain information on the requirements that apply for your discipline at your place of study. For example, some places may require double spacing as some readers of master's theses prefer this for making notes.

Since the layout for AUC's publication series (such as for this handbook) was designed by the well-known designer Bruno Oldani in 2000 (see this handbook's colophon page), the style used is: Times font, font size 12, single spacing, pagination (page numbering) at the bottom right-hand position on the page, and double line spacing to indicate new paragraphs.

Writing and publishing a text reveals the writer's typographical format, writes Hellmark (2000: 82):

One of the most important functions of typography is to translate the pattern of the content of a text into a visible structure on the printed page. The writer's thoughts take shape in the typography; typography is language for the eyes.

A given layout can hold the status of a norm or rule at a place of study. By "rules" here is meant absolute, clear and formal requirements to how students should organise their master's thesis. These are given under the sub-heading **Rules** in the following. By "norm" here is meant a suggestion, a

starting point which the student can either adopt fully or use to adapt the relationships between content and form which he/she wants to get across or prefers for reasons of habit, research community or aesthetics. These are found under **Checklists**, while **Useful Tips** cover ideas and basic words of advice.

9 The main message here is that once a form has been chosen it should be adhered to throughout the entire manuscript. You should make this choice as early as possible so that what you write from the very beginning bears the mark of being integrated and carefully weighed. The purpose of keeping the same form throughout the text is to avoid vagueness and to increase precision and readability. By following up and consciously adhering to the rules that apply for text presentation in different forums it will be easier to reach the intended target group and win approval there. Besides, the examiners and your supervisor may not be the only ones to end up reading your master's thesis; imagine other potential readers when working on your manuscript!

2. Interaction between content and form in scientific texts

Content and form are mutually dependent, and have to do with the means we have at our disposal for gaining the readers' interest and acceptance. The writing process entails shaping the information you want to convey to your readers. It is you as the researcher who has it all "in your head" and who can draw the readers into the text by unifying it thematically. Try to express explicitly what your focus is or what direction you want to take, and do not hide your ideas behind vague formulations. First and foremost, writing a good technical text entails constantly thinking about where you are heading and what you want to express rather than finding elegant plays on words. Your first priority should therefore be to make it clear what you intend to do, after which you can add the finishing touches to the wording to see if it gets your message across. Regardless of which form you choose, the content must above all adhere to the rules that apply for scientific texts and meet the formal requirements to documentation in a master's thesis.

Graphic designers know a lot about the relationship between content and form and can get a message across in totally different ways than can non-specialists. The form tells the reader how the text is organised and how the writer is inviting the readers to find their way around in the text. A good reason for working on the form is that it can contribute greatly to clarifying your own thoughts by focusing on the purpose, what you want to emphasize and the means available to achieve this. Moreover, a clear and thoroughly prepared presentation enhances readability and reinforces and structures linguistic formulations and content.

The layout of illustrations and the typeface (fonts, layout) influence how the text is perceived. It is a big advantage – and a basic requirement – that your choices are adhered to methodically.

Here I would like to highlight some fundamental rules and experiences on being consistent in your presentation. By "consistency" is meant that, for example, all references are treated in the same manner, the relationships between the heading levels are logical and consistent, and that words are spelt and references cited in the same manner.

Example

Consistency also implies being methodical. Avoid placing commas or periods in the same way as in the preceding sentence here, or citing references thus: "(Olsen 1890, p.3)" rather than satisfying the requirements to space that should apply after punctuation, thus: "(Olsen 1890, p. 3)." Also avoid writing, for example: "as Per Olson (1890, p. 3) says", because "Per" is not a keyword for the reference in the reference list! Some people use their PCs like a typewriter, entering line breaks when they reach the right margin.

Useful Tip: Preliminary headings and subheadings will help you to sort your content into contexts where they belong. These preliminary headings can be removed or transformed into headings and subheadings once your work begins to take on a more cohesive form. I often prepare a rough outline so that I can keep entering text in different places (jigsaw puzzle) and revising the outline as I go along. This means that you sometimes work on several chapters simultaneously, other times only on one.

Useful Tip: Just as you can mark (outline) printed text with a felt-tip pen, you can also mark your electronic text with colours for terms you want to follow up, wording you want to use in your conclusion, everything you need to remember to return to in a text whose page numbering and size changes every day.

2.1 Planning and research log

Prepare a progress or action plan before you begin your work. Whether you are working independently or collaborating with others, planning is equally important. You can save a lot of time and frustration if you plan your presentation of the text right from the start, including how you use your PC and what you expect it to do for you. This also includes your choice of layout and how you collect and organise your material into a presentable form.

You could make an outline or model of the work process for your own use (Buzan 1977; Tracy 2002). Record dates for when you can expect to have your theoretical platform ready for commencing the work, when data collection will need to be done, people you need to contact and when. For example, how much time you will need for the final revision, copying and binding? What is the average number of pages you will need to write every month if you are to achieve your planned scope? By thinking through all the tasks you will have to complete under the terms set by your place of study, you will make sure that you get everything done by the deadlines for the work involved.

When collecting data, make a note of everything that happens and who you have been in contact with. You should also keep a separate, electronic research log. It can become difficult to recapitulate facts and ideas later on. Your research log will be somewhere where you can retain details during the process and will gradually contain pieces of material that you may be able to use in your thesis. By writing down immediately any reflections you may make on your own research process and any experiences you have, you will clarify your thoughts and get new ideas.

Useful Tip: Students probably always feel pressed for time when writing their master's thesis. Nevertheless, allow yourself as much time as possible by beginning to read relevant theory and finding out about research methods before you develop your design, data collection or action research measures.

2.2 Use of “I” and “we”

The researcher must present his/her argument objectively and keep himself/herself and his/her relationship with whoever or whatever is being examined in the background. This distancing strategy also entails different guidelines in research literature regarding the use of “I” and “we”. Unnecessary use of the first person may give the impression that the researcher lacks sufficient distance to his/her material. When referring to personal experiences or something you have done you may use the first person wherever it feels natural to do so. However, it is safer to try and avoid personal pronouns by reformulating your sentence. “We” is used when the reader is drawn into an argument or reasoning, for example: “Another way we can find out more about this is to discuss the issue with colleagues and supervisors.” Generally speaking, you should use personal pronouns sparingly. Having said that, usage varies from one discipline to another, so the safest thing to do is consult your supervisor.

2.3 Form – requirements and considerations

Some of the requirements to form that are presented below are of a general nature while others are based on my personal preferences and understanding of layout.

A personal layout design requires an understanding of all the options that are available to us on modern PCs. We can use a wide range of tools to vary the text and presentation by using different fonts and inserting illustrations. But this provides us with numerous, seductive options which we are not always able to master as meaningfully and confidently as graphic designers! Also, be critical about aligning right margins in normal text

processing programmes; because they create irregular and large spacing between words, they do not always enhance readability. I do as little as possible to the layout myself and try instead to present the material in a way that is organised, consistent and easy to understand!

2.3.1 Paragraphs

I indicate new paragraphs with a double line space, as shown here. Some people indicate paragraphs without a line space, but with this style it is not always easy to determine whether it is supposed to indicate a new paragraph or whether the line space is a result of a random choice or key stroke. Others prefer to indicate new paragraphs by indenting them, without line breaks, as is often done in books, and it is easy to see that the new paragraph has been created intentionally. If you choose this style, it must be practised consistently.

Rule: Paragraphs that begin below a heading should never be indented. The function of the paragraph is to give the reader the chance to follow an argument or reasoning and to indicate natural breaks in the text. They should carry significance and be able to stand (be read) alone.

Paragraphs follow a certain structure (Furuseth and Everett 1997:50):

1. Thematisation, including the main idea
2. Explanatory sentence
3. Arguments
 - a) Sentences that support the argument
 - b) Contrasts and comparisons
4. Concluding sentences that express findings and conclusions

2.3.2 Footnotes

We use footnotes for content that would otherwise distract the reader's attention from the text if they were included. Footnotes should be brief, informative comments to the text and should preferably not be so numerous that they make the manuscript difficult to read.

We have three main alternatives: footnotes on each page, notes or endnotes at the end of each chapter or at the end of the thesis. The first alternative is the most readable option, in my opinion. All the same, add as few footnotes as possible.

2.3.3 Illustrations in scientific texts

If you can better clarify your text by using examples, you could illustrate them. What can illustrations summarise better than text, and when can they prove distracting? An illustration can give readers completely different associations and its significance depends on what is said about it in the text.

Useful Tip: While models and illustrations may seem self-explanatory to you, they may not be so for others. A good idea is to try them out on other readers before they are included.

Avoid repeating quotations or illustrations in different places. Think through how much information the reader needs in order to understand your presentation and, based on that, decide how the data can best be illustrated. The purpose of an illustration is to provide an explanatory example or information about something (give the reader a “picture”) that is difficult or complex to express with words. Table and figure captions should be self-explanatory or, as stated in the APA template (2001), they should supplement – not duplicate – information given in the text.

Rule: All illustrations should be numbered sequentially and entered in special lists that are placed at the beginning of the thesis following the table of contents.

Rule: Sources for all illustrations belonging to other writers must be cited, with permission from the publisher when necessary. In the case of illustrations that have previously been published and to which you have made changes, you must cite their source and state what you have changed. The source reference should indicate where the illustration comes from (author, work, year, copyright/permission if appropriate, and page number) and should be listed in the reference list.

The presentation of illustrations has to do with the interaction between content and form, how well they convey the content and how they are positioned in relation to the text. They must therefore be understandable and must communicate well. Tables and figures are compact, detailed and eye-catching, and provide a snapshot of a bigger picture. They present certain features or factors but do not explain data or relationships between the data and other variables. Illustrations should always be accompanied by text which tells the reader what they are intended to convey.

The designation style for tables and figures should comply with the general rules that apply to your disciplinary field. Page references for illustrations should be given at the very end (see Proofreading and Quality Assurance). In any case, the text should refer to table or figure numbers. If there are many, you could enter a list of them after the table of contents.

Tables

The purpose of tables is to determine which group a phenomenon belongs to. Tables are often created with headings and subheadings in the table head and are divided into columns and rows. It is the column headings in the table head that show how the information in the table is organised in the columns. The numbers or letters in the subordinate columns are called data fields.

Purposes:

- To give an overview of a large mass of data
- To support and supplement what is stated in the text
- To state values and illustrate the main effects

Rule: All tables should be numbered and have a caption which should be positioned above the table and be self-explanatory.

Useful Tip: Students who produce tables from statistical programmes ought to be familiar with layouts and column and row percentages.

Rule: If you use statistical tests, the results or size of the tests, the degree of freedom, the significance level and the direction should be stated. If you have descriptive statistics, state the mean and standard deviation, the variance or standard error of the mean and median.

Numeric information, words or groups of letters are systematically grouped in the table. Rows and columns enable comparison. Do not create tables for a tendency that is easier to express in words or if the figures account for only one row. Keep in mind that too many tables can make it difficult for the reader to maintain an overview due to the condensed presentation of information and breaks in the text. The table should not replace the text, it should simply illustrate it. It is not the reader that should interpret the table; the writer is supposed to do that. Explain in the text what type of information the table is intended to give. The text should not however repeat information contained in the table in its entirety, but rather refer to central and relevant features in the table which elucidate the problem.

Useful Tip: It may be expedient to present categories and typologies in table form.

Rule: The table number should be referred to in the text, for example: “As shown in Table 1, the ...” or: “See Table 1”, but never, for example, thus: “the table above” or: “the table below” (or a table without a stated number).

Rule: Tables should preferably not span multiple pages. If they have to be split, repeat the table heads on the next page.

Figures

Figures, models, drawings and diagrams should illustrate something for the reader, and preferably in such a way that the reader does not have to interpret the individual elements in the illustration.

Rule: As for tables, figures should be given captions and numbers but these should be positioned below the figures.

Diagrams are geometrical figures that should clarify relationships.

Bar charts, histograms

- Frequency distribution with absolute values, percentages or fractions (discrete, non-continuous variables).
- Both axes must be given designations (for example: “Age” on the X-axis and “Results” on the Y-axis).
- The figure must explain what the bars represent.
- If multiple diagrams are to be compared, the axes must be identically scaled!

Pie charts, circle diagrams

- State proportions or percentages of 1 in relation to 100.
- The number of sectors in the pie chart should not be too great, perhaps no more than five. It is usual to arrange the sectors from the largest to the smallest, starting at 12 o’clock.

Curve graphs and line graphs

- Illustrate progression, joining points in a coordinated system. Such points can be circles, squares or triangles joined together by lines. The X axis represents the independent variable, the Y axis represents the dependent variable (in an experiment).¹

Scatter diagram

- Displays a set of points in a coordinate system but without joining them together. Often depicts bivariate (two variables) material, and most often displays correlation.
 - Both axes must be designated.
 - The size and design of the scale and symbols can influence how the data is read and interpreted.

2.3.4 Tables of contents and indexes

Table of contents

An electronically created table of contents presupposes that you have already selected multi-level heading styles, either by using built-in heading styles or user-defined alternatives.²

¹ An experiment involves comparing the effects of what the researcher does in two similar groups. The researcher manipulates independent variables in the test group and then observes the differences between the dependent variables in the test and control groups.

² When you create a heading, you write it in the same way as for the rest of the text but create a line break to the subsequent chapter. You then mark the heading before choosing the header style you want to mark it with.

The table of contents can be created with numbered or unnumbered headings (select Insert > Index > Table of Contents). Start by placing the cursor on the page in which you want to position the table of contents. When you subsequently change it, click outside the table so that it becomes shaded, select Table of Contents and confirm that you want to correct it. Alternatively, select the table of contents and right-click on Update field.

Rule: The table of contents and page numbers are positioned after the foreword and should include the reference list. After the table of contents come the lists of tables, figures, abbreviations and appendixes, though no page numbers are required for these.

Useful Tip: As your manuscript gradually grows in size it is wise to create a table of contents, as this will show you how you have structured your material at all times. In large manuscripts you can also save time by clicking on a heading in the table of contents to bring you directly to the chosen heading. The table of contents is easy to update at the end of each session after you have moved or revised text or headings.

List of tables

Rule: Numbered lists should be included and should be entered after the table of contents.

List of figures

Rule: Numbered lists should be included and should be entered after the table of contents.

List of abbreviations or acronyms³

If your text contains abbreviations, these should be entered in a separate list and positioned after the table of contents (do not use abbreviations in the text before you have first explained their meaning to the reader).

List of appendixes

Rule: Numbered lists should be included and should be entered after the table of contents.

Index of authors

An index of authors, which indicates on which pages the represented authors are referred to, is used mostly in text books. This list must be created at the very end of the writing process and positioned at the end of the manuscript, after the reference list but before the list of topics. I do not recommend students to make this a priority as it is extremely laborious and is unnecessary in a master’s thesis.

³ Acronyms are words that are formed from the initials of words that come after each other, e.g. Benelux, NATO

List of topics

I would also recommend students not to make this a priority either, as it can easily become rather troublesome and demands a high level of technical expertise to evaluate what is important and unimportant to include in such a list. A topics list should be created at the end of the writing process once all the layout has been completed and should be positioned at the very end of the manuscript.

2.3.5 Chapter headings, main headings, subheadings and sub-subheadings

Consistency can also be illustrated by the form I have chosen, with three levels of headings in the table of contents. Students must evaluate this on the basis of readability and stylistic conventions at their place of study.

Rule: New chapters should be given a new page and should start by introducing to the readers what each chapter will deal with (guide the reader on what is coming next).

When I use default or user-defined headings in Word, this enables me to quickly define main and subordinate headings that have similar font types and sizes throughout the entire manuscript. This is achieved by selecting each heading in the manuscript with a defined level in Styles (Level 1, 2, 3). By consistently avoiding making more than one manual line break after electronically selecting a heading level you can avoid ending up with a muddled layout with uneven lengths of space to the text below the heading levels. Students must decide for themselves how they want to distinguish between headings and whether they want numbering or not (numbering can be achieved by choosing Format > Numbering).

Rule: Do not use periods after a heading, do not split words (begin on a new line instead) and do not use abbreviations in headings.

Try to formulate headings that are in line with the main title of your paper or problem and that also provide information about the content. The headings in the next chapter (such as Data Analysis, Results and Discussion) are intended to indicate the function they have in a scientific text. They are not intended to be ideally worded headings or independent of research conventions.

2.3.6 Source references and reference lists

It is necessary to be familiar with how different types of sources are formatted in the reference list:

- Articles in anthologies
- Articles in journals
- Editor of and, at the same time, author in an anthology
- Books

- Authors with multiple titles
- Reports
- Material from the internet and newspapers

In Appendix 1, the reference list and in the following I will illustrate how these are handled. The format for the reference list is according to APA style. Other research communities use other styles, but the main point is that the way these reference styles are used should remain the same throughout the entire manuscript.

References to page numbers can be written thus: "Olsen (1850 p. 12)" or thus: "Olsen (1850:12)." Just be consistent in your choice!

Rules:

- When you refer to the reference list in the text, the reference should be to the same surname or institution and year as that which appears in the reference list: "(Andersen 1990)".
- For quotations, the page number and designation must always be cited (headword – author's name) and year: "(Andersen 1990:3)".
- When you repeat a source which another author has referred to, cite the name and year of the source to which the author refers (for example: "(Pedersen 1988 in Andersen 1990)") and state the author's surname in the reference list.
- You can also write: "Andersen (1990) refers to Pedersen (1988) who asserts that ..." In any case, it is only Andersen (1990) that should be included in the reference list.
- For references to multiple authors of the same work, state the surnames of the first three authors, for example: (Andersen, Pedersen and Olsen 1990). For more than three authors: "(Andersen et al.)".
- For references to multiple sources in the same year by the same author: "(Andersen 1990a; 1990b; 1990c)" and the same sources are repeated in the reference list.
- For references to something which is stated in several sources by the same author: "(Andersen 1989; 1990)".
- For references to several authors who express the same thing, summarise what it is that they have the same opinion on and cite the sources thus: "(cf. Pedersen 1988; Andersen 1990; Olsen 1993)" in chronological order.
- References to government documents can be organised in a separate reference list entitled "Government Publications". Be consistent here. For example, cite the name of the government agency first, followed by the issue date: "KUF (1990)" so that you can then refer to the issuing agency (KUF 1990) in the text. In APA format, everything in the same alphabet should be entered in the reference list.

- For references to sources on the internet⁴ include the author/editor of the article, the internet address (URL) and date of retrieval, thus:

“Akershus University College (2009):

Library guidelines (accessed on 2009-01-07).

Accessed at: <http://www.hiak.no/index.php?ID=368>”

(URL is now so familiar that it is really not necessary to include it).

Sources retrieved from the internet are handled in the same way as printed sources and are listed by title or author.

In these guidelines a distinction is made between internet websites and articles in electronic journals. References to internet sources are cited as in the example above; references to articles in electronic journals are cited as for printed articles, only that the database from which the articles were retrieved is added, along with the internet address, thus:

Gundem, B. Brandtzæg (2008). Didaktikk – fagdidaktikk, anstrengte eller fruktbare forhold? <http://adno.no/index.php/adno/index> (Accessed on 200905-25). *Acta Didactica Norge, Vol 2. 1* (2008)

Sources from radio and television programmes or other electronic media do not always have an author, in which case you should cite the institution’s name along with the date of recording or publication and the name of the programme.

Rule: All sources that are referred to must be published so that they can be retrieved by others by means of literature searches. Lecture notes and similar sources must therefore be omitted. Note that any references to newspaper articles that are to be included are entered as footnotes.

Useful Tip: Create a correctly formatted reference list right at the start. It will save you endless difficulties later on in trying to find sources which have since been revised or had their pagination changed in different publication dates or which are impossible to get hold of quickly during the final stages.

In scientific literature abbreviations such as: op. cit., ibid. and loc. cit. are used in order to avoid having to repeat the same reference several times. These should be used with great caution out of consideration for readability. For example, it is difficult for the reader to keep up if such abbreviations are entered in a footnote or refer to an author with multiple

⁴ See also Redman (2001).

publications listed in the reference list. My recommendation is that such abbreviations are not used in a master’s thesis, but it is useful to recognize them when reading other reports, for example. (In APA style these abbreviations are preferably not used):

- Op. cit. = abbreviation for opere citato (latin), “in the work cited” and loc. cit. = abbreviation for loco citato (latin), “in the place cited”. According to the Chicago Manual of Style (1993:582), both are written with the name of the author. For example: (Olsen op. cit.:20). Here the author’s name and, where appropriate, page number are cited.
- Ibid. = abbreviation for ibidem (latin), “in the same place”. An abbreviation for referring repeatedly and consecutively to the same work, in the same place. Used when an expression or statement is cited from the same source, written as: «(ibid.)” without the name of the author. In other words, “ibid.” is used instead of the name of the author or the title of the work. This ought not to be used on more than one or two pages or where references to other sources are cited. You should not use too many such references consecutively, and exercise caution if you subsequently revise the text.
- NB: “ibid.” and “loc. cit.” can mean the same thing, i.e. «in the same place” or “in the same work”. Whereas “ibid.” is only used for successive, multiple references, “op. cit.» is used for other sources that are cited intermittently. If used too often the reader will forget the source and will have to go back and search for it.

2.3.7 Line spacing, line breaks, margins and page breaks

Set the top and bottom margins so that you get the same utilisation of space throughout the entire manuscript. When you create a page break to indicate a new chapter, let the distance to the top of the page be the same as your settings (do not add manual line breaks). A 1.5 cm top margin and a 3.5 cm bottom margin will leave space for footnotes so that they do not span across several pages (and deprive other footnotes of space). A 3.5 cm left margin and a 1.5 cm right margin will leave space for binding double-sided printed pages (see the shaded area of the ruler in Word). This setting presupposes that you can use a printer that allows double-sided printouts.⁵

If your text is to be printed using single-sided paper, the right margin can be almost as wide as the left one. A 3 cm left margin and a 2 cm right margin would be suitable for binding and stapling.

Margins can be a problem when you have wide tables and figures. If necessary, these can be extended out to the right margin (this applies to sin-

⁵ It is often necessary to mount an extra unit in the laser printer in order to print on both sides of the paper. Check out your options before finally deciding on the settings on your PC.

gle-sided printouts only; with double-sided printouts an extended right margin will run into the binding if it appears on the left side of the page). You can also adjust the table by reducing the font type (to 11, for example) and use the Autofit function to adjust the content.

Rule: Subheadings that end up far down on the page must have 2–3 lines of text below them (Hellmark 2000) or be moved to the next page.

Rule: A new page for each chapter. Pages should not have widow lines; a heading or last line of a paragraph which appears at the bottom of a page should be moved to the next page. Tables and figures should not be split unnecessarily or at random.

Useful Tip: The page make-up should be done at the very end but before the final electronic table of contents is created. Do not move the text downwards using the Enter function because any subsequent changes you make will create a corresponding gap to the next paragraph. Nevertheless, be consistent and always use Insert and Page Break when you do decide to create a page break (for a new chapter, for example).

2.3.8 Cover page – title page and pagination

The title should appear on the first page (the cover page) together with the author’s name, place of study, year and type of study.

The foreword should not be given a page number. It is therefore practical to let the cover page and foreword appear as separate, unpaginated pages within the document. The master’s thesis should be paginated all the way through to the appendixes (which do not follow the pagination used in the thesis and are created as separate documents).

2.3.9 Quotations

Rule: Quotations taken from interviews should be marked by quotation marks. Short quotations (fewer than 40 words) are also positioned in the text in quotation marks. If you choose to omit sentences or words from a quotation, these are marked with three points, thus: [...] to indicate this to the reader.

Longer quotations by other authors are indented, written without quotation marks and, for example, in italics and font size 11. Note where the period is positioned in relation to the source reference:

Let us assume that a person in a spoken language culture wanted to think through a particularly complicated problem and to accomplish to formulate a solution, something which in itself is relatively complicated and can consist of a few hundred words. What should he or she do to hold on to this verbalisation, developed with great

difficulty, so that it can be subsequently recalled? In the total absence of writing, nothing exists outside the thinker, no text that enables him or her to repeat the same sequence of thoughts one more time or to show that it even existed. (Ong 1996:47, my translation)

Rule: When citing quotations, the page reference should always be cited directly after the quotation as well as, where appropriate, who has emphasized something (underlined or italicised) or translated or changed a text that is not reported in its exact original form. Quotations that are cited verbatim, using the same spelling and punctuation as the original even though they contain spelling mistakes, can be marked thus: “[sic]”.

Useful Tip: Do not include too many quotations as this will make the thesis resemble a transcript! It is better to reformulate a quotation and cite its source, thereby using your own words to show how you have understood it. It is not the reader’s job to interpret and determine what is important in the quotations or in the relationship between them and the surrounding text.

2.3.10 Appendixes

It is important to sort out what should be included as appendixes, what should be recounted in the text, and in what way. Appendixes are given in their original format and often consist of raw data.⁶

Rule: The appendixes should be named and numbered, with a new page for each new appendix, but should not be included in the pagination of the report. Appendixes consisting of several pages are numbered at the top right-hand corner of the first page.

Appendixes should provide readers with more details on information that is given in the text or can enable them to check:

- that statistical calculations are correctly performed (reproduce raw data matrices, interview transcripts)
- formulae, complicated constructions, computer programmes designed for the study
- how tests, questionnaires, interview questions or interview guides (topics that are discussed during interviews) were designed

⁶ Data on all the facts that are used in the study are used, whether they appear as figures, the result of interviews, surveys, observations or written or oral sources (for example, transcribed interviews). Raw data is data in an unprocessed form that is often difficult to recount in its entirety in a running text but which can exemplify findings in the text in the form of quotations and statements. Nevertheless, exercise moderation when it comes to the number of appendixes. Seek advice from your supervisor if this is unclear or if you are unsure about the scope of an appendix.

- what types of permission were obtained for a study
- reproduction of text that has been interpreted (wording of statutes, in-depth interviews)

The text should contain references to the numbered appendixes and their content should be recounted in the way in which you have interpreted the information. The reader should not have to read an appendix in order to interpret the text, but should be able to examine an appendix if there is a need to check or gain a deeper understanding of the author's reasoning.

Useful Tip:

- Bind the appendixes to the thesis separately if there are too many of them. In such instances, remember that the cover page and the title must state what a separate appendix contains and to which thesis it belongs. State in the main part of the text that the appendixes are attached separately.
- Broad tables and figures in appendixes can be reproduced in landscape format or can be scaled down.
- For large/numerous appendixes, you can print the name of the appendix at the top of a coloured sheet and use this as a divider between appendixes.

2.4 Proofreading and quality assuring your manuscript

Quality assuring a manuscript takes time, even if you regularly correct minor errors or wording during the writing process. The most important thing is to allow yourself enough time to put the manuscript, or sections of it, aside for a few days and then read it through again. In the meantime, our fantastic brain will have been working and, after a well-earned break, may produce a number of new ideas. It is after taking breaks like these and re-reading a text that has been put aside for a while that it is easier to see what revisions should be made. It is not certain that the reader will understand the text in the way we want him/her to. Also, try to find a qualified reader for your manuscript; it is amazing how something which we take for granted may be incomprehensible to others. Some find that reading the text out loud can help them to identify grammatical errors or long-winded sentences that they previously overlooked.

It is worthwhile allowing good time before submitting a piece of research so as to detect errors and omissions in content and form. There is no getting away from the fact that poor layout, carelessness and lots of spelling mistakes (which a spell check could have remedied) give a bad impression of how much work has been put into a master's thesis.

Examples of this are variations in heading and subheading styles which make it difficult to determine how the author has organised the material.

Different spellings of a concept or an author's name can also give rise to misunderstandings.

One basic but common mistake is not checking the in-text references against the reference list, which can result in titles being omitted or cited with the wrong year or the author's name being omitted because the first name was used in the text. At worst a student can be deemed to have omitted an important detail or to have shown uncertainty as to which source was used.

Useful Tip: Try to make quality assurance work a routine task. For my own part, I add titles to the reference list, check spelling and think about wording etc whenever I lack enough inspiration to work on actually producing text. In this way I maintain contact with the text and get some of the routine work done at the same time.

The content should:

- be read consecutively to check that the scientific requirements that were set have been met
- be read to check whether what you are conveying is significant and important for elucidating the problem
- be read to check whether the language could be made more precise and whether you guide the reader by being clear about what you want to do and why

Changes to content or the positioning of text can lead to the (revised) parts no longer hanging together with the rest of the text. This can be detected if you take the time to read back and forth. It is worthwhile making the effort to make ongoing revisions to the text. It is time-consuming to both proofread your own work and make the necessary revisions, but I advise you not to leave these tasks until the last minute.

The best way of quality assuring your master's thesis is by reviewing it on the basis of different criteria, either *content* or *form*, as it is surprisingly difficult having to perform both tasks equally well simultaneously:

1. When you have spent a long time on a large piece of work, you will find that you have used wording that has become obsolete, redundant or that almost seems incomprehensible to you the author after a while. Repeatedly reading your text *content* involves reflecting all the time on what you really want to say. It also involves removing wording which initially made sense when you wrote them but which have since lost their value in terms of what has subsequently become central and important.
2. Checking the *form* should be carried out continuously, correcting all mistakes as you come across them. Once you have the final product, or when you read it again at a later point in time, you are guaranteed to find a few misprints.

3. Before you carry out the final review and check the *content*, you should check the following points of *form*:
 - Heading levels: does the use of headings, subheadings and sub-subheadings correspond logically with the way you want to organise the content of your manuscript?
 - Does the numbering and designation of figures, tables and other illustrations in the manuscript tally with the corresponding lists, and do these appear after the table of contents?
 - Do all the appendix references (numbers) in the manuscript tally with the list of appendixes and with the sequence in which you have presented them? Do the titles of the appendixes have the same designation as those cited in the manuscript?
 - Have all the references that are cited in the manuscript been included in the reference list?
 - Are there references listed in the reference list that are not cited in the manuscript?
 - Is the reference list correctly formatted?
 - If you have inserted cross-references and references to sub-chapters, illustrations or page numbers in the manuscript, do these still tally? Cross-references to page numbers are not advisable, as the position and size of the manuscript can change right up to the end.
4. After this, your focus should revert to the *content*. Take the time to read your manuscript thoroughly. Consider sentences and paragraphs and the relationships between them.
5. Your final task should be to calmly and happily leaf through your master's thesis, checking that the layout is consistent, that the text, headings and illustrations are correctly positioned on the page and that the formatting of and spacing between the paragraphs are consistent. Any revisions you now make can again have consequences for some of the points listed above.
 - Check whether you need to carry out a new page make-up (see section on line spacing above).
6. It is at this point that you can create the indexes you want and update the table of contents for the last time.

Virus attacks and hard disk damage are frightening. That is why you should take backups of your manuscript along the way. This can easily be done with the help of an inexpensive flash drive. These can be directly connected to the USB port on your computer and work like a simple hard disk. Some students create a Hotmail address (can be obtained free of charge on the internet) and send files to themselves, while others use private/work computers in the same way. Also take regular printouts and date these (for example by using Insert > AutoText > Headers/Footers). If all else fails, a good printout can at least be scanned.

3 The scientific way of thinking

“I used to see things, meu bom, but I didn't recognize them for what they were. I knew about all sorts of things, but I didn't know how to know.”

“Now you're talking worse than a professor, *compradre*. “I didn't know how to know.’ What's that, a charade or a riddle?”

“When a child eats a piece of fruit he knows what the fruit tastes like, but he doesn't know what makes it taste that way. I know things, but I still have to learn the whys and wherefores, and that's what I'm trying to learn. And I'm going to do it, *camarado*, just you wait and see.” (Amado, 1971: 213-214)

The objective of a piece of scientific work is to gain new knowledge. Knowledge lies in the unknown until it is in turn succeeded by new knowledge. By questioning the knowledge we already have, this can also be challenged. Undheim (1996) asserts that all research has a desire to go beyond describing actual conditions, i.e. towards explaining causal relationships. The purpose is to offer a deeper understanding of relationships between different factors and a deeper insight into underlying conditions and processes.

Another purpose can also be to look for meanings or relationships in texts and statements or to contribute to changing social conditions. Regardless of how your research is oriented, it will not be enough to simply present something on which you have personally gathered information or know about. A scientific way of thinking demands a critical distance to a discipline one perhaps knows very well, either from personal experience, personal relations or thematically. There is no room for supposition; all statements concerning relationships must be verifiable or traceable. Likewise, the premises that underlie your conclusions must be clearly communicated. This means that your arguments should be based on evidence from or evaluation of your own or others' research through facts that support or weaken your arguments. In other words, your personal sense of wonder must comply with certain rules in order to be scientifically grounded. Comparison is a fundamental principle of science, and rules, principles and approaches have been established for how this can be done methodically. However, it is never the choice of method alone that

determines whether something is scientific or not, but rather how you reflect on what you do and how you explain your research.

Your master's thesis reflects what you choose to investigate through systemising and disseminating it. The most important and most comprehensive elements in the master's thesis are the topic you wanted to investigate, how you went about investigating it, what you found and how you discovered it (theory, problem, method, analysis, result and discussion). These elements determine how the content is structured around the introduction and the summary, the statement of the problem, the presentation and grounds for your choice of relevant theoretical bases, method of approach, results and conclusion, and the consequences for future research and practice.

The headings in this chapter contain general requirements for disseminating a piece of scientific work independent of the order in which they are presented here. In other words, you are not given a definitive sequence or table of contents for a master's thesis, and not everything covered here will be equally relevant to the type of research you are conducting.

There are many reasons why there is no such thing as a definitive template that must be followed slavishly when writing a master's thesis, as we will see below. One reason for this has to do with conventions for disseminating research within different disciplines. Another has to do with the fact that different choices of method and/or multi-method approaches can require different ways of structuring content.

The IMRaD structure is popular in medical research traditions and in some of the natural sciences (Tønnesson 2008:90–91). These norms are stringent and are practised “by medicine's humanist neighbours only to a minor degree”, he maintains.

IMRaD (Introduction, Methods, Results and Discussion) entails dividing research papers into well-defined units that do not overlap. According to Lærum (2006:149–150), the paper should provide other researchers with very specific forms of information:

What were our questions?

How did we conduct our research?

What type of data did we collect?

What do our results show?

What conclusions can we draw from this research?

The same categories are used in these guidelines, only with slightly different names. For example, when the importance of formulating design is emphasized below, this comes under the Method category in the IMRaD structure.

Svensson (1996) writes that qualitatively oriented reports are in many ways structured along the same lines as quantitative reports, with chapters for the introduction, method, results and discussion, only the chapters differ in as much as the research process is organised differently. Whereas in a qualitative study one explains that one uses the problem as a means to find important concepts, in a quantitative study one operates with a problem that deals with how pre-defined concepts correlate. Where a qualitative study represents a possibility for or a stage in the development of a new theory, a quantitative study is one in which the theory is tested.

Although I place Design between Problem and Theoretical Basis in the following, it is not given that this will always be the appropriate order for every master's thesis. My order is selected on the basis of the importance of designing a plan for the research process as early on as possible, even if this plan is subsequently changed along the way. For example, in exploratory studies development of the design will occur over time, while in experimental studies the design must be absolutely clear and be based on a theoretical basis before the work on data collection begins. When the problem should test (confirm or refute) a theory, this should emerge in the chapter dealing with the theory and then be introduced. In quantitative study design, on the other hand, a clear distinction is drawn between the theory and problem development phase and the data collection phase. Such factors will have an influence on where the study design is positioned and how it is accounted for in the master's thesis. In grounded theory methodology Glaser & Strauss (1967) assert that one should use data to formulate a problem rather than have a ready-formulated problem in advance.

The problem and the study design can be presented at the beginning in research that deals with development, change or action-oriented measures. In action research the problem, and thereby, for example, the choice of method and theoretical approach, can be developed over time. In large action research designs different methodical approaches can be combined. In action research, which can represent a gateway to data processing/collection, the researcher plays an active role in implementing a possible solution. The researcher performs an action in close cooperation with the interviewees/observation objects. In any case, the methodological choices that are made in an action research design must be subjected to the same scientific guidelines which, viewed in isolation, apply for the individual methods (qualitative or quantitative approach) that are employed in the design. It is difficult to envisage events before they occur. The study design in case studies is also often changed, new problems are developed, new possibilities emerge or the research involves interviews which require new questions and follow-up. In such studies it can be more natural to present the data analysis and discussion of data in the same chapter, but this depends on the nature and scope of the data involved.

It is also the case that different methodological approaches set different requirements to how the validity of the data can be established. If one wants to find out how people perceive a given phenomenon, what their experiences are or if one must interpret a text, the causes and explanations for people's behaviour become more subordinate. The focus then shifts to methods that ensure the verifiability of mapping and analysis. In development work there is a focus on describing what happens and on accounting for and discussing what happens in relation to what one intended to do or achieve. Exactly what brought about what is regarded to be a result is often due to a number of factors over which one has no control. The opposite could be said to apply in the case of stringently controlled tests, where it is precisely the control over what leads to what (the cause) that is fundamental, and which variables can be kept constant in order to study variations of a specific feature (variable). The design will therefore determine the scope of validity for interpreting the result. It will also influence what is natural to bring up in the individual chapters and how you should refer to them.

Within different research traditions and methodological approaches (Askerøi 2005) it is necessary to use scientific terms correctly and to avoid confusing them. In a qualitative approach, where the purpose may be to investigate how something is understood or experienced and the researcher has proximity to research objects, terms such as *validity*, *traceability* and *reliability* are used for evaluating results. On the other hand, in a quantitative approach, where the purpose is to measure or prove something about given research objects and to generalise according to statistical requirements, we evaluate whether the results can be generalised on the basis of their validity and reliability.

Useful Tip: Start by familiarising yourself with the documentation requirements that apply for your discipline, your place of study and the research approach you choose, and use this handbook in conjunction with such requirements.

3.1 Research ethics

Research requires ethical decisions that entail treating research subjects and research colleagues with integrity. The Research Council of Norway (2001:7) regards scientific dishonesty as “serious breaches of fundamental norms of scientific integrity, truthfulness and respect for others’ contributions to the research process.”

Research must be free and independent if we are to be able to place trust in the way in which results come to light with the methods and frameworks which the author acquaints us with. If one decides on a specific

conclusion in advance or if one manipulates results for the purpose of advancing one's own or others' interests, the results will be biased and will therefore have to be rejected. It is therefore important to demonstrate how you challenged your own preconceptions by acknowledging them and giving the reader access to all the trails that led to the result or that influenced it.

Furthermore, researchers must consider whether the research process and publication of the results could prove damaging or detrimental to those involved. Collection of personal data requires permission. In the school system this may be granted by either the head teacher or the chief county education officer, depending on what information is required. Be aware that obtaining permission can take time. How the data will be collected and applied can also require declarations of consent from persons of majority age. Other relevant bodies are the Data Inspectorate (2009)⁷ and the Norwegian Social Science Data Services (NSD) (2009), which is the privacy ombudsman for research and student projects in higher education. In projects where the processing of personal data can be linked to individuals, notification must be given to the NSD. In the Ministry of Education and Research (2006), the Act on Ethics and Integrity in Research is presented. See for example children's and adolescents' right to protection in research and the Vancouver Criteria regarding co-authorship.

Rule: Wherever it is important:

- The anonymity of persons and institutions involved or mentioned shall be ensured (neither the researcher nor the reader should be able to identify the parties being investigated).
- The persons and institutions involved or mentioned shall be ensured confidentiality (the researcher knows who the sources are but shall not disclose them).
- Permissions shall be obtained in advance from the Data Inspectorate, the management at the institutions involved or other authorised persons or bodies.
- Your role as researcher shall be made clear. Do you belong to a power structure which has the ability to influence what kind of information you obtain, or are you receiving remunerations or carrying out an assignment for others?

Other researchers shall be cited as references and others' ideas or work shall not be reproduced without citing their source (see section on references). This also applies to any collaborative partners or co-authors (see also Spangen (2007)) for guidance on the use of sources). Failure to cite

⁷ See for example Stene (1999, Appendix 3) on statutory provisions concerning the use of personal data.

the sources of quotations is considered research misconduct or “simplified paraphrasing” of other researchers’ contributions. See for example *Stop plagiat nu* (Stop Plagiarism Now) (2009) regarding scientific integrity.

Particular caution should be exercised with respect to texts that are cut and pasted from different sources and then presented as the author’s opinions with no consideration for the sources. This is plagiarism. All sources used by the student must be cited. This phenomenon, known as “patchwork plagiarism”, is more widespread today due to the easily accessible volume of information available on the internet. If a source proves difficult to find, the text should not be used.

Useful Tip: In addition to the obvious ethical aspect, it is risky to steal other people’s work because it is easy for readers who are scholars in the field to expose. On the other hand, referring to other people’s work demonstrates strength and a good knowledge of the given field of knowledge in that different sources which may shed light on the problem are considered. Where other people’s work confirms your own ideas you can explain how the ideas or results concur.

The Copyright Act regulates copyrights, and intellectual property is protected for 70 years after the author’s death. The owner of copyright is entitled to compensation for the use of illustrations in your manuscript. If in doubt, consult the website Clara.no (2009), an online information centre for copyright and clearance, which also provides a link to the Act.

3.2 Key components in the content of a master’s thesis

In order to be able to compare other researchers’ empirical data with your own investigations it is important to go to the original source and assess what results emerged, when, how, where and why they emerged, and what validity they have for your findings.

An academic piece of work contains one form or another of the elements described below. By studying other academic reports and discussing them with other students and your supervisor it will be easier to determine the progression and scope that is most appropriate to the individual problem, method and place of study. The number of chapters and their titles will vary according to the nature of the paper, as will what each individual chapter can deal with in relation to the others. The subsections below are intended to direct attention towards what must generally be included in a piece of academic work. These suggestions on what the student ought to think about during the research process also serve as pointers for what must be made clear to the reader.

3.2.1 Title

Formulating an appropriate title – with perhaps a subtitle which defines the topic more precisely, arouses curiosity and says something about the content – is a major challenge. The title, the headings, and therefore the table of contents ought to reveal the content as best as possible and should preferably be self-explanatory. The title must also give a good description of the problem.

The title and the concepts contained in it are binding on the problem and how it is to be elucidated. Many readers (including me) assess a title and scrutinize the table of contents and the reference list first in order to get an idea of what the author is concerned with and the theoretical foundation of the work.

Useful Tip: With respect to the title and the problem, it can be useful to carry out the following exercise: write down what you really want to say something about, formulate your message in at least five different ways. Give yourself time to develop a title that is appropriate to the problem and discuss it with others.

Useful Tip: The title of your research paper can be retrieved in databases. Key concepts can serve as trigger words in the title, the abstract or the problem to help others who search for whatever you have investigated. Avoid wording such as: “an investigation” or: “a study of” and use key concepts or trigger words instead.

3.2.2 Foreword

Why did this piece of research work evolve, what was its purpose, who contributed and should be thanked? If you want to include something more personal, the foreword is the appropriate place for this. Read other forewords to get ideas and consider whether or not you want to include one in your thesis. If you do not consider it important, then leave it out! The foreword has no academic function and should be as brief as possible. Consider carefully what content is suitable for the foreword, introduction and abstract.

3.2.3 Abstract

The content of the abstract differs significantly from that of the foreword and introduction. It should provide an overview of the most important aspects of your work and should be able to stand alone. The readers should get a comprehensive and brief presentation of what the author has written about, and it should include the thesis title, problem, method, result and conclusion. What were you looking for, what did you find out and how, what does the result mean and how can it be applied? The abstract must therefore be written last.

The abstract is positioned before the introduction and should not be too long, i.e. somewhere between one to three pages. Requirements to the abstract will vary from one academic community to another. If you read slowly through your manuscript once it is finished, key concepts and wording will emerge which can be adapted for use in the abstract.

Useful Tip: The abstract serves the same function as a blurb for a book, something which can “sell” the content and which can appear in the academic library’s internet overview of your institution’s master’s theses. Consider also which academic communities, external parties or persons such as examiners and supervisors will be your potential readers in the future. What other academic libraries ought to receive information about your thesis through your abstract?

3.2.4 Introduction

An introduction should provide a general outline of the topic of your work: your justification, your personal interest and choice of problem, what you want to do that is new (in relation to what has previously been done in the field) and how you intend to go about it? Give a brief account of the thematic and methodical delimitations of your work. What do you want to achieve with your research?

You can also include a brief account of the theoretical framework for your work and of others’ empirical data on the topic that holds significance for your problem. This must be balanced against the content of the subsequent chapters, where design, theory and method are explained more fully, so be economical with the information you give here.

Finally, explain in plain and simple terms how the rest of the text is structured and what you are going to discuss in the chapters that follow.

Checklist:

- What is important to let the reader know about right from the start?
- Who are you, the author?
- What is the purpose of your thesis?
- What is the motivation behind the work, the academic experiences and theoretical perspectives?
- What are the key topic(s) and problem(s)?
- Give an outline of the orientation on which your theoretical framework is based and of empirical data from other studies that may shed some light on what you are seeking to investigate.
- Introduce key concepts.
- Give an outline of how you plan to proceed in finding out what interests you.

Useful Tip: Outlines for the introduction and conclusion can be created along the way and in parallel, as they are closely interrelated and should be viewed in relation to each other. Preparing a draft conclusion as you go along will help you clarify where you want to end up and what the objective of your research is. If you collaborated with others, explain what this entailed, how you organised the work and what influence this had on the result.

The introduction may come as a natural part of the text in the first chapter or it may stand alone in a separate chapter.

3.2.5 Clarification of concepts and definitions

A definition explains the meaning of a concept. Determine whether any alternative definitions exist and, if they do, analyze what the similarities and differences consist of and explain how you understand and apply them. It is important to present how you personally understand key concepts and what purpose your understanding serves so that the reader adopts the same understanding as you have. Conventions for the scope and positioning of clarifications of concepts and definitions will vary.

Useful Tip: You can place your definitions in contexts which you consider to be the most natural if they are discussed elsewhere in the manuscript. But concepts or definitions that are important for the reader to be able to follow your presentation should be introduced and explained early on.

Some authors use concepts without citing the sources (because they believe that everyone is familiar with them). However, problems often arise when such concepts are used without the original definition being given and in such a way that the actual meaning is vague or ignored. Scientific documentation requires an independent understanding of key concepts. If you use a concept in a different way than originally intended by the originator, it is important that you explain why and how. The concepts you choose must, however, be used consistently. Use primary sources (first-hand sources); secondary sources (second-hand sources) give others people’s renderings or subjective interpretations of a theory, result or idea and can at worst give limited or incorrect information.

An operational definition of a concept tells us how we can examine a concept. Only once this is made clear to the reader is it possible to form an opinion on the choice of method you are explaining (see Design). If you create your own concept you should discuss whether the definition is reasonably rooted in reality or relevant theory.

3.2.6 Developing your discussion or hypothesis

What do you feel passionately about, what do you want to know more about and who could benefit from you finding out more about it? A good

place to start is to concentrate on a field that can engage you as a researcher, whether it be a need for an in-depth study, for changes in the workplace or challenges or issues in society at large. Adopting a new perspective and looking at something from another angle can lead to new ways of viewing a phenomenon.

The problem for discussion must be justified and be clearly delimited, both in terms of what is possible to achieve and of what is significant. It must also have direction in the sense of being so specific and precise that it makes clear to the reader what is to be investigated and who the problem involves or affects. All problems must be formulated in such a way that they can be translated into action (operationalised) so that it is possible to undertake a study.

Arriving at a problem or a hypothesis⁸ concerning empirical conditions that you want to investigate and that are researchable is perhaps the most important, but often the most laborious, phase of a research process. Furuseth & Everett (1997) offers guidance on formulating problems.

Useful Tip: If the problem can be answered with a yes or no (rhetorical question), then it is not good enough. We must formulate the problem in such a way that we can use (operationalise) it to elucidate whatever we are interested in.

The problem can deal with why something occurs, about the relationship between what one knows and does not know about something, whether it has to do with personal interests or a specific scientific problem.

Who knows something about this field of study? How close can you get to those who know most? Problems are elucidated through data (empirical data) from your own or others' investigations, and involve a choice of method that can elucidate the question, decisions on how you want to proceed (design and choice of method) and what you can do (data collection).

All concepts used in the problem and the research questions that are derived from it must be defined or specified and must be followed up in the chapters dealing with theory and in the conclusion. Similarly, the problem and the research questions that are derived from it determine both the presentation of the results, the subsequent discussion and the conclusion. It is in the chapter containing the results that you discuss how the data can provide answers to the questions you have asked!

⁸ The hypothesis concept is mostly used in hypothetical-deductive methods and refers to propositions about possible relationships between variables (often about hypotheses that can be statistically tested).

Checklist:

- What is it you want to change or what is it you are unsure about and want to know more about?
- What is your problem about and how can it be delimited?
- What research questions does the problem you have formulated give rise to?
- What are the key concepts?
- What type(s) of relationship(s) exist between two or more phenomena?
- What properties (variables) do you intend to investigate?
- What new questions are you asking in relation to existing knowledge?

Useful Tip: Formulate as many research questions as possible on the basis of the problem and assess how these can be answered. The research questions can be used to organise your presentation of the theory and data collection or they can lead you to formulating interview questions.

Useful Tip: Abandon formulations of research questions that are redundant or difficult to undertake, but set them aside; it is possible that when you finally assess your research you will see and account for alternative paths you could have followed.

The research questions you derive from the problem can initially be positioned after it or be included in a more comprehensive summary (design) of what your research will cover. Should the problem derive from a theoretical problem, this should be presented after the chapter on theory. Nevertheless, it is the problem that will determine your study design.

3.2.7 Study design – how to go about elucidating the problem

In the study design we provide a message about the message, a summary of what the reader should keep in mind in the presentation that follows. The study design (the research plan) covers all the activities which the researcher must plan when answering the problem: who is covered by the study (population and selection), what is to be studied (variable), which thematic and theoretical connections the study has, the method of approach and time schedule (when) and strategy for how the study can be undertaken (or what type of statistical conclusions can be arrived at or what criteria and funding are involved). Last but not least, it has to do with what you want to use the data for.⁹ Questions like these demand that

⁹ For example: What will I elucidate with the help of the answers from an interview, and how will I use the answers? Who can answer, why can they do that and how many people do I need to ask? Can I ask everyone (the population) or must I select some (sample), and how and why do I select them? What consequences do these choices have for interpreting the results (data analysis) and how far can I rely on the information (empirical data) provided by the data?

you consider what type of data you need for elucidating the problem, who or what you want to find out more about, and *why*, *when* and *how*.

How the problem can be elucidated must be made clear to you yourself and to the reader at an early stage and does not necessarily have to be described in a separate chapter on design (see the section entitled Introduction in this chapter),

Checklist:

- What are you most interested in elucidating, changing or finding out?
- What is the purpose of the work (the research questions)?
- Has anyone studied this before? If so, who and how?
- What theoretical material do you want to emphasize?
- Which methods can you use to elucidate the problem in the best possible way? Which one(s) will you choose and why?
- How can you interpret data using this/these method(s)?
- What will be the time sequence for carrying out your work?
- What are the strong and weak points of your research design?
- Who is affected by the study and how can the results be used in future?

Considering questions like these can save you a lot of frustration if the data you have collected fails to say a great deal about what you really wanted to investigate. For example, many students distribute questionnaires without thinking through what the answers to the questions can really tell or how they can be summarised and interpreted. Data collection tools that you create yourself or that are not valid for a specific population must be tried out in advance (or a pilot study be taken) on people that are as similar as possible to those for which the material has been developed.

All research requires the research strategy to show how the research questions can be answered and will often require that we use different methods of answering them in one and the same study. Marshall & Rossman (1989:78) presents key research questions, research strategies and examples of data collection methods based on the purpose of the study:

- *Explorative study (investigate phenomena that are poorly understood, identify/discover important variables, general hypotheses for future research).*
- *Explanatory survey (explain the dynamics in the phenomenon we are investigating).*
- *Descriptive study (document an interesting phenomenon)*
- *Predictive study (predict the result of a phenomenon, anticipate events and conduct on the basis of the phenomenon)*

In predictive studies we find, for example, experimental design, where requirements to controlling conditions (of manipulation of the central vari-

able) and to ensuring that all assumptions are the same for all participants, are extremely important (see Befring 2002). The purpose of these studies differs from those for explorative studies or where qualitative approaches are used.

Kalleberg (1996: 50-55) refers to three types of research design:

- *Constative research design: how and why something is, was or can become (explore)*
- *Evaluative research design, where the purpose is to verify/reject assumptions (evaluate)*
- *Constructive research design, such as action research, where the purpose is to find strategies to improve a situation (change)*

A design cannot always be characterised by just one research method approach; in action research different approach methods are often used side by side.

How data can be interpreted depends on what type of design is chosen for a study. Put simply, it could be said that data from an exploratory design can say a lot about the sample involved in the study, whereas data from an experimental design can be generalised for everyone they apply to (the population) based on the sample on which the study was conducted.

Useful Tip: Consult the literature on method and your tutor to understand what consequences different designs have on how results can be interpreted.

How comprehensive your design description should be and where it should be positioned will vary depending on the type of study and research conventions. For explorative or qualitative studies and, for example, action research, the design needs to be developed over time and the method can be explained at the beginning and in subsequent chapters.

3.2.8 Theoretical starting point

There are many different explanations and ways of understanding the phenomena we are interested in, and we therefore need to study others' theories and test them or develop new ones. Research literature gives theoretical suggestions that have significance for which research questions should be posed. It can serve as a door opener or guide to the landscape in which you want to orientate yourself. Which theories or what type of research can elucidate the problem? What are the key concepts in the chosen literature? The purpose of your choices of theoretical material is to provide an overview of the knowledge status of the field being studied.

The literature you use should help you to arrive at new knowledge, to find answers to something that was not known when you started out or to con-

tribute to developing a problem for research. It is necessary to constantly think about how relevant the theory is for your work. When you explain others' points of view, these represent something on which you base your argument. This reasoning entails keeping a critical distance to the sources, how you understand them, what consequences the different viewpoints have, what connections exist between them and how they can elucidate your problem or the topic you want to work on.

When we study theory over a long period of time we often come to a point where we find something about what we are interested in practically everywhere we look. In order to set some limits it is important that we constantly assess how others' theories and research can contribute to weakening/supporting our own hypotheses.

Theoretical perspectives serve as a starting point for defining the concepts that are relevant to our area of study.

Checklist:

- Do any theories exist that can elucidate the problem?
- Are there any empirical data that can elucidate the problem?
- What do you want to find out which has not already been elucidated?
- Define key concepts as they are used by others and show how you personally understand them.

Useful Tip: Never write something that you do not understand! It is a good idea to make a note of how you understand and associate your readings and then gradually refine your wording as you go along. Page after page of quotations for which no relevance is provided by the author is not a presentation of your personal understanding of the material. A helpful tip here is that the reader is very familiar with the theoretical material you provide, so be accurate when citing your sources.

Useful Tip: When referring to others' results as a starting point for comparison with, for example, your own results, check how these have come to light (sample, time, research method) and thereby how suitable they are as a basis for comparison.

A critical distance to sources, or source criticism, which is fundamental for historians, has to do with interpretation: who, where, when or what. What views does the source represent and in which academic context can the ideas that are expressed be found?

3.2.9 Research method approach

The choice of method entails looking for methods of studying the phenomenon that interests you. It is the problem for discussion that must always determine the choice of method, not the other way around. It is

rarely the case that only one method is suitable; constraints on time and resources can however determine the choice. The choice of method must be justified and an evaluation can be made of why other (equally suitable) methods were not chosen. The choice of method requires that you are absolutely sure about what you want to investigate.

Once you have chosen your method you should reflect on and present theory for what type of validity you can achieve for your data using your method of choice (reliability, validity, credibility, verifiability). For example, a multi-method approach (triangulation) could increase the credibility of the data (Askerøi and Barikmo 2005).

The choice of method – how you want to proceed in order to elucidate the problem – should be presented on the basis of the premises for data collection that underlie the method(s) itself and what requirements the method(s) set to how it is carried out. The data collection tool you choose will be decisive for how your data can be processed and interpreted and will require an understanding of research methods and statistics.¹⁰ Your chosen method will also have consequences for the role you play as researcher, how you influence who or what is involved in your research. In what ways can it be envisaged that your interpretation of the phenomenon you want to investigate will influence your choices (pre-understanding)?

Useful Tip: It is useful and necessary to read several books on method in order to find an appropriate answer. One book alone will not contain everything you are looking for, and different authors hold different opinions regarding method. Making use of and gaining an understanding of this literature is something which tutors and students must arrive at together.

Useful Tip: Formulating questionnaires is not an easy task. Answer the questionnaire yourself, give different answers and try to interpret them or collaborate with other students in a similar way.

3.2.10 Conducting studies

How did you apply the research method(s)? How did you collect data and how did you process them? How was the data collection conducted? One scientific requirement is that an account be given of the data collection process so that others can replicate your study provided that the conditions

¹⁰ Before you use a data collection tool or, for example, develop a questionnaire, you should think about how the results are to be processed. In order to use a statistical program it must be possible to quantify the questions you formulate. You must also decide which level of measurement the variables will be given (nominal, ordinal, interval or proportional).

are homogeneous (replication) or they are adequately described so that your tracks can be retraced (verifiability).

When giving an account of the data collection process, the checklist below can serve as a reminder of what is important for your study and your choice of research method(s). Prepare a systematic overview of what type of data was collected, when, which methods were used and how many entities were included in the material. This is an advantage if you used more than one method or collected data at different times or used different groups of respondents.

Checklist:

- Who (sample and population) or what have you investigated?
- Did you test the data collection tool before conducting the study? If so, what did you find out?
- What types of sources did you use (primary, secondary)?
- How were people treated (privacy protection, confidentiality, anonymity)?
- What permissions for data collection were granted? (Original(s) enclosed as appendix(es))
- How were the people contacted and what expectations were they given? (Original(s) enclosed as appendix(es))
- What tools did you use for collecting the data? (Original(s) enclosed as appendix(es))
- How did you organise the data collection (notes, telephone, tape recordings, QuestBack online surveys or prepaid envelopes, etc) and why did you choose this method?
- What was your preunderstanding of the phenomenon you studied?
- What was your role in collecting the data (observer, participant, managed the process, external)?
- What procedures or instructions were followed (by others, if appropriate) during the collection of data?
- What statistical methods were used?
- At what points in time was data collection undertaken and why were they chosen (before/after something was carried out)?

Useful Tip: Give an account of *why*, *what* and *who* was studied and *where*, *how* and *when* they were studied! This is where your notes from the planning phase and your research log will come in handy for evaluating what is important and what is unnecessary to explain in your thesis.

3.2.11 Data analysis

The way in which the data collection was conducted (see above) will lead to the issue of what status the data has – what your data can say. An analysis of the data you have collected requires that you comment on the individual components of the data.

Checklist:

- Did you influence your sources and thereby your data (more so than what you had planned)?
- What type of data did you collect?
- How valid are your data (reliability, validity, credibility and verifiability)?
- How did you proceed in categorising the data (application of criteria for developing categories)?
- Did you obtain the data you needed to elucidate the problem and answer the research questions you posed?
- Did you obtain the sources from which you planned to obtain data?

3.2.12 Results – what did you find out?

What were you looking for in your study? The data ought to be presented in an organised and clear manner and must be structured and systemised in such a way that the results can be linked to the problem and the research questions. The way in which the data answers the research questions can constitute significant reservations in the subsequent discussion of your results.

Large masses of data must be given a manageable form. This means that they must be simplified or condensed in some way or another. For example, qualitative data could be categorised, a process which entails repeated reading and inspection of the data to uncover key themes. Interview data must be transcribed and presented in an organised and readable form. Quantitative data can be given in tables and other illustrations so as to present them in an organised way.

Useful Tip: Give some thought to what you can provide as appendixes and on what you choose to present and comment on in the paper.

In experimental or hypothetical-deductive studies it is usual to present the results and the discussion of them separately. In such studies it is appropriate to start off with the main result and then present the rest of the results without discussing these in a separate chapter on results.

In explorative studies and with qualitative approaches where you wish to use quotations to illustrate findings with statements, the distinction between the presentation and the discussion of the data is less clearly defined. The data analysis, results and interpretation are more often presented together in such cases. For example, it might work well if you presented what you found in one area and discussed this against the theory before proceeding to the next set of results. You could finish off with discussing the results across the board by broadening your perspective and evaluating the main features of the findings.

3.2.13 Discussing the results – how has the problem been elucidated?

To begin this part of the thesis one usually assesses whether the main problem was answered or whether the hypothesis was verified or falsified. In quantitative studies one begins by giving a brief account of the main findings and then presenting the data so that they can be discussed. In qualitative studies the distinction between the presentation and the discussion of the data is more subtle. In the discussion the results should be tested critically and the arguments evaluated. Discussion entails arguing for (pro) and against (contra) the individual findings (i.e. whatever a research questions has resulted in).

It is in the discussion that you first begin to form conclusions and interpret and evaluate the results in terms of the questions you posed. Can the reader understand what you have done and follow your line of thought? This is where the problem, research questions, method and theory are all linked to the data. The theory you introduced and your choice of method will provide a background for interpreting and explaining the results. Each of the research questions you posed should now be answered through systematic reasoning. How can the result be interpreted in relation to the theory, other empirical data, other findings and your choice of method?

Again, it is important to keep a critical distance to the material and not to overinterpret the data. It is important to argument both for and against and to consider whether other explanations could be valid or what the similarities and differences between the findings consist of. By substantiating your arguments in concrete terms and evaluating objections that may be raised you will strengthen the credibility of the results you believe to have arrived at.

Begin by presenting the main results, how the problem and the research questions have been answered. You can use the research questions to organise your presentation, if you like. Are some of the results surprising or inconsistent with what you had expected to find?

Rule: Be careful not to generalise findings or draw conclusions for which you have no backing. Do not draw concepts used for statistical measurements into a discussion of qualitative data. Use concepts with care!

Requirements to the discussion also apply if the main body of your work consists of developing a (teaching) programme or tool (multimedia, audio-visual or similar). A description of how the tool is (intended) to be used must in any case be placed within a theoretical framework and must be based on the same requirements in terms of analysis, evaluation and synthesis as work on other scientific work.

If the master's thesis constitutes developmental work, a scientifically based analysis should be given of the processes or measures that led to the

result. In these cases the implementation of new solutions or methods of managing the problem are important and should include an account of the development strategy/strategies and a retrospective evaluation of the chosen strategy/strategies. It should be shown on what basis the project was founded, how the measure was implemented, who participated, how participants took part and were affected by the project, what appeared to trigger certain changes and how these were distributed and applied. By documenting the development process the relationship between theory, intentions, different choices and what was achieved can be elucidated.

Checklist:

- Have all the research questions been answered?
- Why do you think the result of the study turned out as it did?
- How did you fulfil the method requirements that you set?
- Did the chosen method(s) provide answers to the problem?
- What were the similarities and differences compared with other/previous results in the area?
- Have you documented the result that concurs with or conflicts with the theory you explained earlier?
- Have you considered whether underlying data, other variables or other facts can explain the result just as well as your work in the field?
- How can you show what led to the result of your research process?
- What could you possibly have done in terms of method to improve the result?

3.2.14 Conclusion – what can we ascertain or summarise?

The conclusion completes the thesis and should give a synthesis of your work. A synthesis gives a compilation of individual components that are joined together to form a collective whole. This is where all the loose ends can be tied up and the main features of the result can be precisely defined. Your contribution to new knowledge (the synthesis) consists of your ability to demonstrate that what you discovered is explained by what led to the result.

Checklist:

- Which results are important, significant or stand out (what is the main finding in a quantitative study)?
- What were the strong and weak points of the work (why did it turn out the way it did)?
- What are the practical consequences of the work (is there something you want to investigate further)?

The conclusion should contain an overview of the work, the findings or results you arrived at and their credibility. A good conclusion also opens for new questions and new thoughts, alternative ways in which the work could have been conducted or point towards new research questions.

The conclusion serves as a summary and is posited on the information that has already been given. Avoid bringing up new results, theories or other information that has not already been presented or discussed.

Rule: In quantitative studies, new theories should never be introduced in the presentation of the data, the discussion of the results or the conclusion.

Rule: Without a clear problem it will be difficult to form a conclusion. Your conclusion or summary must be based on the problem; check that you have answered the questions you yourself have set.

Useful Tip: You can experiment in evaluating the problem and preparing draft conclusions in parallel to check whether the problem and the method you have chosen will provide you with answers to the research questions and an opportunity to conclude reasonably.

4. Evaluation

The Russian writer Anton Chekhov is reported to have said that in poetry and the theatre it is not the solutions to problems that are important, but rather the way in which they are approached.

It can happen that researchers are faced with so-called “negative findings” or data that says a lot less than expected (as in the case of low response rates). A “negative” finding is also a result and one which may be very significant. Such results must be analyzed in the same way as other results and are not something that will go against the student if he/she accounts for the probable causes of the finding and what effect this had on the interpretative possibilities. Whether the results are scarce or abundant, it is our interpretation of why this was the case and what alternative methods are reasonable and could shed new light on the subject that distinguishes between research and conjecture.

4.1 Scope

Only a rough estimate of the scope of the work involved in a master’s programme can be given here. For example, the number of pages produced through group collaboration is not directly comparable with an individual piece of work. We all have different ways of articulating ourselves in writing; some use many words, others few, but both texts can be equally good. Evaluation has more to do with deciding whether or not so many words are necessary, such as repetition, long-winded descriptions or quotations or what could be described as waffle. A less comprehensive text which demonstrates that whatever is being disseminated has been thoroughly prepared will be favourably evaluated when whatever was necessary for elucidating the problem and explaining the result has been adequately presented to the reader. A text which contains the elements that are necessary and sufficient to make it a scientific text will be evaluated positively, regardless of its length.

Smaller project reports often vary between 10 and 30 pages. The number of pages is of secondary importance compared with the quality. A maximum limit of somewhere between 60 and 120 pages is sometimes given for master’s theses (excluding appendixes). Such limitations are sensible on the grounds that a well prepared text is better than a more descriptive

but not particularly analytical text. This is not entirely without reservation, however, because many students will consider it appropriate and important to cite quotations from interviews to illustrate how categories emerge or to recount narratives that are important for the reader's understanding. In such cases 100 pages can easily prove constraining.

Scope is evaluated differently by the individual places of study, and students should check what criteria apply in advance. Express requirements to low page counts do not necessarily mean that the work can be undertaken in a shorter space of time: the more stringent the requirements to showing an understanding and independent evaluation of theory and research method, the longer it will take to develop an overall perspective of your manuscript so that waffle can be removed. Editing a manuscript to remove unnecessary, long-winded or repetitive statements will result in a more compact text. When students undertake a R&D project a given volume of text is bound to emerge between the introduction and the conclusion, but it is understanding what is important in terms of content that will ultimately determine the scope and quality of the work.

4.2 Evaluation criteria guidelines

Evaluation criteria must be viewed in relation to the ultimate learning outcomes of the study programme, which serve as guidelines for what is to be evaluated.

The challenge for the student is to make sure that the reader understands the ideas that are presented. The examiners who must evaluate a student's work on the basis of the manuscript cannot infer what the student has understood and learnt unless this is reflected in the work.

The preceding chapter offered tips, rules and general requirements that are set for scientific work at the final stage of a master's degree. The quality criteria that were given in the preceding chapters can be applied to both supervisory work and evaluation. With respect to the supervisory work, these criteria can serve as general goals to aim for. How much weight is attributed to these criteria must be viewed in relation to how far a student has come in his/her studies. One main criterion, which also applies to written examinations, is that you answer the question which, in the case of your master's thesis, was defined by you.

In the following I will present quality criteria based on the preceding chapters and summarise them thematically in terms of how the master's thesis is structured and edited, whether the author demonstrates independent work and whether the necessary scientific understanding is documented.

4.2.1 Coherent and relevant presentation

The theoretical methodological basis should be described in a structured and understandable way and it should be made evident why the theory and existing research results are relevant to the problem. The choice of research design must be justified and described.

The data analysis must show how the data have been produced and how they have been used. The data should be presented in a coherent and not too detailed manner. Tables, figures and models (illustrations) should not account for too large a portion of the paper and the student must get across whatever is essential for understanding these in the text. It is also important that whatever is presented in the appendixes is easy to understand, as is the way in which the appendixes are commented on in the text.

An evaluation will be made of how consistent and organised the student is in dealing with references, quotations, the reference list, the table of contents and indexes so that the reader can easily find his/her way around in the material. Coherent and relevant presentation means that data collection, systemisation, interpretation and presentation are accurate and understandable.

4.2.2 Independent work

Scientific work is evaluated according to how well the author manages to penetrate the problem area by demonstrating understanding, reflection and maturity. It is important here that the student demonstrates a good command of theoretical and methodological material, analytical skills and a critical approach. Weight will be attached to whether the problem can result in new knowledge.

Independence also means originality of approach and the ability to make the most of the material that is available. This entails that the design of the interview questions must be able to elucidate the problem and that the student has contemplated strong and weak aspects when designing the questions that were used. This involves justifying your own choices on the basis of the problem. The choice and design of the project strategy and research design must be justified and documented and the problems, research strategies and methods must be chosen on the basis of a conscious and reflective view of knowledge and science.

4.2.3 Interpreting and discussing the results

The student is expected to demonstrate an understanding of the consequences of the chosen method, to use relevant theory to elucidate the problem and to discuss the results in relation to the problem and theory.

This also requires the student to distance himself/herself from his/her results and experiences and to be able to evaluate how he/she may have in-

fluenced them. By adopting a balanced approach to one's own results you will demonstrate insight into the problems of generalisation.

The conclusion should contain a summary of your work and findings, with a focus on significant issues rather than on details and should demonstrate a critical and scientific approach. The student must demonstrate the validity of the conclusions that are reached. Importance is also attached to the ability to see new professional problems.

4.3 Grading system

In Report no. 27 to the Storting (2000–2001) the Norwegian Ministry of Education and Research endorsed a new common degree structure for higher education. The bachelor's degree should be awarded for three years of higher education and lead to professional qualifications and/or the possibility of admission to higher degree education. The three-year bachelor's degree replaced the former four-year *cand. mag.* degree. Higher degrees are based on lower degrees and last for two years and should lead to professional qualifications and /or the possibility of admission to doctoral studies. The master's degree should be awarded after two years of study and should replace the former *hovedfag* degree from 2003. The scope of the independent work in the master's degree accounts for one year of a two-year full-time course of study. The master's degree represents a deeper understanding of the bachelor degree studies.

The Quality Reform that was passed by the Stortinget (the Norwegian Parliament) in 2001 is aimed at improving the quality of education and research. Some of the measures include closer follow-up of students, new forms of examinations and assessment, quality assurance and internationalisation.

The ECTS (European Credit Transfer System) was established by the European Council and developed through the EU's Erasmus and Socrates programmes for translating and transferring examinations and examination qualifications between different national educational systems. It also serves as a tool for comparing and interpreting different courses of study, grading systems and grades and for converting credits from different countries. In Norway a pass in a one-year course of study worth 20 credits is equivalent to 60 ECTS credits, and 30 ECTS credits are equivalent to one semester. In other words, one credit (student workload) is equivalent to 3 ECTS credits.

This new common grading system was introduced in Norway in 2003 and the educational institutions have developed qualitative assessment criteria that describe how the grades should be understood and applied. In its rec-

ommendation, Det norske universitetsråd (Norwegian Council of Universities) (2000) supported a scale of five grades from A to F where F indicates a fail. This scale is based on a qualitative description of the individual grades.

Universitets- og høyskolerådets studieutvalg (Norwegian Association of Higher Education Institution's Academic Affairs Committee) (2002)¹¹ recommends general qualitative descriptions on which to base the grading scales at course level between similar education programmes, as in the first three columns in Table 1. The fourth column concerns subject-specific evaluation criteria and what should be awarded formal grades, such as examinations, practical experience, project assignments or master's theses at the individual places of study. The subject-specific evaluation criteria in Table 1 were stated in HiAk's Curriculum for the Master's Programme in Technical and Technical and Vocational Pedagogy (Lahn et al. 2003) and on the basis of the following three quality criteria: coherent and relevant presentation, independent piece of work, and interpretation and discussion of results.

The qualitative assessment criteria should not be used to convert the numerical grades in the previous system. Certificates will therefore state the numerical grades from previous examinations together with the alphabetical grades from 2003.

The master's degree leads to a deeper understanding of the bachelor degree studies and concludes with a piece of scientific work. Kvalitetsreformen (Quality Reform) allows for various forms of evaluation and more comprehensive continuous evaluation during the period of study and replaces the previous forms of examination in higher education, which were based exclusively on readings studied during the academic year.

¹¹ Letter from the Norwegian Association of Higher Education Institution to member institutions dated 29.05.02

Table 1. Qualitative descriptions of grades for master's theses in *Tehnic*

Symbol	Designation	General qualitative description of the assessment criteria	Subject-specific description of evaluation criteria ¹²
A	Excellent	High level of knowledge. Good analytical skills. Can apply the knowledge in an independent manner.	The master's thesis demonstrates an excellent overview of and perspective on the field of <i>Tehnic</i> and Vocational Pedagogy. The approach to the field of study is independent and original and points to new professional challenges. The research design shows documentary evidence of a thorough methodical and scientific theoretical insight. The theoretical and methodological basis is relevant and demonstrates good application through discussion and analysis of the problem. The analysis documents the validity of the conclusions that are reached. The research work is presented in a structured and clear manner and represents a contribution to the development of knowledge in the field of <i>Tehnic</i> and Vocational Pedagogy.
B	Very good	Good overview of the field of knowledge. Can apply knowledge of the field in an independent manner.	The master's thesis demonstrates a very good overview of and insight into the field of <i>Tehnic</i> and Vocational Pedagogy. It documents independence in the choice and application of the theory. The chosen research design is well justified and well suited to elucidating the problem. The presentation is well structured, thorough and organised.
C	Good	Can explain the most important elements in the field of study. Can independently apply knowledge of the field of study to a certain degree.	The master's thesis demonstrates a relevant overview of the field of <i>Tehnic</i> and Vocational Pedagogy. The theoretical and methodological bases are relevant. The presentation is structured and organised, and demonstrates good coherence between problem, results, and conclusion.
D	Satisfactory	Lacks an overview of the most important elements of knowledge. Is unable to apply the knowledge in an independent manner.	The master's thesis demonstrates an adequate presentation of the choices of theory and method, but the theoretical and methodological bases are poorly applied. Coherence between the problem, results and conclusion is demonstrated. The bases for the conclusions are discussed. The presentation is organised.
E	Sufficient	Satisfies the minimum criteria but no more. Is unable to apply the knowledge in an independent manner.	The master's thesis demonstrates an adequate presentation of the choices of theory and method. Poor coherence between the problem, results and conclusion is demonstrated.

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Symbol	Designation	General qualitative description of the assessment criteria	Subject-specific description of evaluation criteria ¹²
F	Fail	Lacks both detailed knowledge and overview.	The master's thesis does not meet the criteria for a pass. The thesis fails to demonstrate relevant insight into the field of <i>Tehnic</i> and Vocational Pedagogy. The theoretical and methodological bases are inadequate or irrelevant. The thesis shows no analysis through presenting research questions nor does it sufficiently document the consequences of the choice of method that was made. The basis for the conclusions that are reached are neither documented nor discussed. The presentation of the material lacks structure in and organisation of sources.

¹² The subject-specific descriptions of the evaluation criteria for master's theses were discussed in the Planning Group for Master's Degree Studies 19.11.02 (Lahn et al. (2003) and in the Teachers Group for the Graduate Degree in *Tehnic* and Vocational Pedagogy 21.11.02.

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Appendix 1: Creating Reference Lists

Source references in anthologies and monographs:

- Anthologies (Wasenden)
- Author with several titles in an anthology (Askerøi a, b)
- Both editor of and author of an article in an anthology (Askerøi & Høie)
- Articles in anthologies in general (Austad)
- Articles in journals (Berliner)
- Monographs (Bromme)

Which rules are complied with below? Note the citation of author names in anthologies, how the position of the page numbers and italicised texts differ between articles in anthologies and journals, and how book titles are written in italics in APA style.

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