

Notes and formal requirements
for creating
scientific papers

Prof. Dr. Matthias Meyer
Institute for Management Accounting and Simulation (W-1)

Status: October 2014
Author: Dr. Iris Lorscheid
(iris.lorscheid@tuhh.de)

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1. Typical contributions of a scientific work

In the following, typical contributions of a scientific work are listed. This should provide an overview of possible paths for **orientation**. Particularly in the early phase of topic identification, this overview can help to **focus** explicitly on a contribution and to **better classify one's own research work** when formulating the research question. Finally, this categorisation can help to determine what the work should and should not do, so that a **clear demarcation** to other (possible and existing) research work on the topic is simplified. The category system was adapted by Murray (2011). It is not to be seen as an exclusive category system, i.e. a research project can be assigned to several categories.

Performing an empirical study that no one has done before.

Linking contents, theories or methods that no one has previously brought together.

Formulate a new interpretation of what is already known.

Investigate something about an organization, country or region that someone has already done for another organization or location.

Apply an existing technology or method to a new area.

Provide an improved, updated or new representation of the ideas of others.

Find out something no one's ever found out before.

To take up new topics that others in the field have not yet considered.

2. The requirements for scientific work

Students are regularly familiar with the handling of scientific texts from lectures. However, the preparation of a scientific paper - be it a working paper, a seminar paper, a diploma thesis, a bachelor's or master's thesis - requires much more than mere reading and understanding. The ability for critical analysis, systematic thinking and last but not least creativity are also required. In particular, this brochure is intended to assist students who have not yet written any scientific papers.

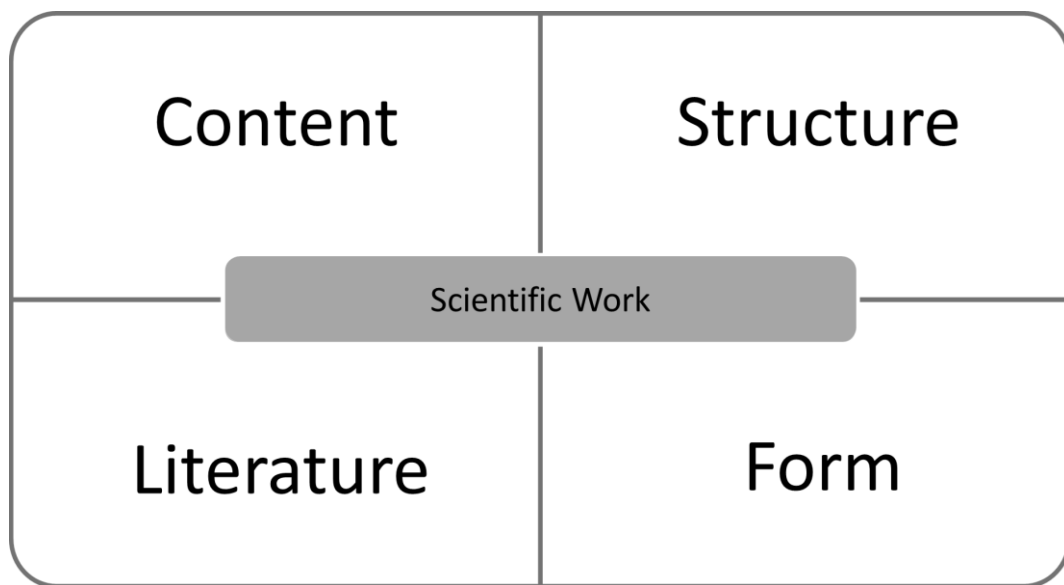


Figure 1 Elements of a scientific work

Successful scientific work is characterized by its quality in terms of **content**, **structure**, **literature** and **form** (see Figure 1). These four elements are described in detail on the following pages. At the beginning there is an overview of the most important points to consider. Within the sections, the relevant aspects are dealt with in detail. At the end of each chapter there is a catalogue of errors that we have observed particularly frequently in the **past**. These points can serve as a checklist during a final review of the work.

As this booklet is limited to the essential points, basic advice should be sought on uncertainties relating to general issues such as timing or work organization. In the concluding chapter "**Further Literature**" some selected books are therefore presented in which such topics are dealt with. Please note, however, that in the event of differing representations of formal regulations, only the regulations contained in this brochure are authoritative. If you have any further questions, please do not hesitate to contact the supervisor of the respective work.

3. The content of a scientific paper

content <hr/> Important aspects at a glance	topic introduction Adequate and well-founded presentation (relevant problem, background or classification of the problem, research objective) Appropriate definition of terms essential to the work
	Working on the problem Presentation of the relevant contents (factually correct, complete in relation to the requirements of the work) Targeted and comprehensible argumentation structure ("leitmotif")
	Use of figures and tables Appropriate use of graphical illustration (quantity, expressiveness, meaningfulness, personal contribution, integration into the presentation of content)
	Conclusions / Conclusion the quality of the assessment or critical appraisal of the results Personal contribution / creativity of the assessment
	methodology Overlap-free systematization of contents Application of the methods (objectively appropriate, formally correct)

Figure 2 Overview: Content evaluation criteria

The core of the scientific work is the content. This should be characterized by own considerations, e.g. by the independent criticism of the existing research and practice on a topic, or the preparation, execution and evaluation of an empirical investigation or a simulation study.

In particular, it is important to set the right priorities in **relation to the research question** and to deal with all decisive questions at the end. As simple as this rule may sound, it is rarely followed throughout. Instead, some facts are presented on several pages, which are only of minor importance or unproblematic for the topic. However, little attention is paid to **answering the crucial questions**. Assistance can be a critical review of the work. In particular, the text passages in which questions are raised that are answered only briefly or superficially should be questioned. Even if there are no sufficient solutions in the reviewed literature, it is important not to despair at these points which are decisive for the processing. Under certain circumstances, the author himself may be required to develop a solution and discuss it. A conclusive argumentation is always rewarded in the evaluation.

Essential elements are **logical conclusions**. This means that both the arguments for and against a view must be explained. If a point of view is highly controversial, the processor is required to personally weigh up the positions shown and take a stand. Illustrations are a suitable means of presenting content, e.g. to show connections.

If statements are to be restricted, a **differentiated elaboration of the content should take** place. The restrictions must be observed throughout, since statements should ultimately stand for themselves. In this context, expressions such as "basically" are often used, as they mean that exceptions exist. In addition, it is also important to transfer the **essential** contents into the structure by creating the headings not functionally, but in terms of content on the basis of the questions discussed in the individual sections (e.g. "The problem of value-based management").

It is perfectly legitimate to **leave out** certain **less relevant content as** long as it is pointed out and justified. This allows you to concentrate on the content and prevents important statements from being overshadowed by an excess of less relevant content.

Description of the content

From the beginning, the research question and the goal of the scientific work should be clear. Only in this way can the topic be dealt with in relation to the problem at hand. The formulation of an **abstract** helps here. A helpful guide to formulating an abstract can be found here:

Koopman, Philip (1997) *How to Write an Abstract?* Carnegie Mellon University, <http://users.ece.cmu.edu/~koopman/essays/abstract.html>

Remark: The questions that are oriented towards the past (e.g. "*How did you go about solving the problem?*" or "*What is the answer?*") can also be answered for the future ("*What will you do to solve the problem?*" or "*Which answer do you expect?*") and thus offer orientation.

Equally helpful for describing the content are the answers to **Browns' 8 Questions** (Murray 2011, S.216-218): (1) Who are the intended readers?, (2) What did you do?, (3) Why did you do it?, (4) What happened?, (5) What do your results mean in theory?, (6) What do the results mean in practice?, (7) What is the key benefit for readers?, (8) What remains unresolved?.

Frequent content errors

FREQUENT ERRORS	RECOMMENDATION
☹ Central terms are not sufficiently explained.	☺ <i>Explanation of all essential terminologies, concepts, and definitions, or reference to basic literature.</i>
☹ Inconsistent use of terms about the sections of work.	☺ <i>Use terminologies consistently throughout your work.</i>
☹ The first question raised or the topic of the work will be dealt with in a shortened form, i.e. only one aspect will be considered, without this procedure being justified or permissible.	☺ <i>The content of the work must fit the question of the work. The problem posed should be dealt with comprehensively.</i>
☹ Statements are not explained in sufficient detail.	☺ <i>provide reasons and explanations for its own statements.</i>
☹ Content contradictions are not recognized or ignored.	☺ <i>Logical consistency within the work.</i>
☹ There is insufficient differentiation.	☺ <i>Clearly work out the different aspects, references and contributions of the work.</i>
☹ Mixing of result description and result interpretation.	☺ <i>First describe the results, then interpret the results for the given problem (in detail!).</i>

(Please note: This list is not exhaustive and is intended only as a guide.)

4. The structure of a scientific work

superstructure Important aspects at a glance	Assessment of the structure Logical structure Meaningful headings Adequate and balanced level of detail
	Observe formal requirements Observe the specified points of subdivision Create cover page according to specifications Record all necessary directories Think of affidavit

Figure 3 Overview: Evaluation criteria for the structure

As a matter of principle, the structure of any scientific work is of central importance. Only through a **meaningful and logical structure is it** possible to avoid overlaps in content and to present the topic in an understandable way. How the reader can be introduced to a problem and how it is discussed depends essentially on the topic in question. It is of fundamental importance that the separation of chapters and sections should **reflect the individual mental steps**. In this case, comprehensive reconciliations between the sub-items can be dispensed with.

Nevertheless, the structures of scientific work show parallels which arise because certain elements cannot be dispensed with. Therefore, we expect the following structure of the work:

- cover page
- table of contents
- list of figures
- table directory
- list of abbreviations
- symbol directory
- 1. introduction
 - 1.1 Problem definition
 - 1.2 Course of the examination
- 2. content (possibly necessary definitions of terms)
 - At least one chapter on the theory, the applied method and the results of the work should be included here.*
- N. concluding chapter
- appendix
- List of cited literature
- List of case law / Administrative instructions
- Affidavit

The page numbering starts with the table of contents. The indexes and appendices shall be consecutively roman numerals and the content shall be consecutively arabic page numbers. The cover page has no page number.

The individual components are dealt with separately below.

Cover page

The cover page should contain the following information:

1. Title of the chair
2. Theme of the work
3. If applicable, title of the seminar
4. Deadline
5. First examiner and second examiner of the work
6. First name and surname, address, phone number and matr. no. of the processor.

Table of contents

The table of contents allows the reader to gain an **initial overview of the** structure of the work. For the sake of **clarity, the** listed headings should not differ in font size. Do not use italics. However, chapter headings should be written in bold to highlight them.

The headings of the text part should be **numbered consecutively**. An outline using Arabic numerals (see above) is recommended. The listed directories shall not be numbered. This also applies to the Annex.

Content presentation

Although the following explanations on the structure of the content presentation take up comparatively little space, the content is of **central importance for the** design of the work. The structure of the content presentation should therefore be revised again if the author has worked out all the essential basics by editing the existing literature or carrying out investigations and can foresee how he will present the topic.

A scientific paper deals with a **question** or a **delimited problem**. In order to introduce the reader to the question, the first subsection of the *introduction* (given outline point 1) must deal with the *problem* (given outline point 1.1) and work out its relevance. The task of this part can also be to distinguish the topic from similar questions and terms. The **SSC scheme "Situation, Complication, Contribution"** can provide orientation for this by first placing the topic in a broader context (*Situation*), then describing an existing problem in this context (*Complication*), and finally showing to what extent the scientific work wants to offer a solution to this problem (*Contribution*).

In the second outline point *Course of the investigation* (given outline point 1.2), the **way in which and in which steps** the problem is dealt with is to be described. On the

one hand, this is intended to provide the reader with an orientation aid. On the other hand, this point also helps with the creation of the text, as it forces the user to verify the coherence of the outline before the writing phase.

The further, content-related structuring points are largely dependent on the problem and not predetermined. It can be helpful to **draw up process sketches that show the red thread**. If terms or concepts are of fundamental importance, it is advisable to first explain them in basic chapters or method chapters. In further content chapters, the study carried out or the model conceived is described, until finally the results are described and interpreted in result chapters.

The final chapter, which is often conceived as a summary or conclusion, is also of particular importance. It **summarises and reflects the main results of the work**. If the topic allows, the final chapter can also give an **outlook** on future developments or present questions following the investigation. However, the final chapter should not provide new insights. In particular, this should not be done if it is titled "summary".

Under certain circumstances, the topic of the work may not allow a complete delimitation of the individual chapter contents. However, even in these cases, **redundant content should be avoided**. The reference tool can be used for this. If a topic is taken up again at a later point in the text, reference can be made to previous remarks. However, references downwards, i.e. to remarks made at a later stage in the course of the work, should be avoided, as a question is to be discussed comprehensively when a question is raised.

For the description of **simulation models**, the **analysis of** the simulation behavior and the communication of the **simulation results** it is recommended to orientate on existing standards.

See the following list (next page):

- ODD protocol for the description of simulation models. Sources:
 - Grimm, V.; Berger, U.; Bastiansen, F.; Eliassen, S.; Ginot, V.; Giske, J.; Goss-Custard, J.; Grand, T.; Heinz, S. K.; Huse, G. (2006). *A standard protocol for describing individual-based and agent-based models*. *Ecological modelling*, 198(1), 115-126
 - Grimm, V., Berger, U., DeAngelis, D. L., Polhill, J. G., Giske, J., & Railsback, S. F. (2010). *The ODD protocol: a review and first update*. *Ecological Modelling*, 221(23), 2760-2768.
- Systematic design of simulation experiments (DOE) for the communication of experiments and simulation results. Source:
 - Lorscheid, I., Heine, B. O., & Meyer, M. (2012). *Opening the 'black box' of simulations: increased transparency and effective communication through*

the systematic design of experiments. Computational and Mathematical Organization Theory, 18(1), 22-62.

In the past, it has repeatedly proved useful to (re)coordinate the structure with the supervisor prior to the process of actually writing the work in the case of scientific papers.

List of illustrations, tables, abbreviations and symbols

All figures and tables used must be numbered according to their order in the text and listed in **separate lists**. A corresponding procedure is not prescribed for the handling of mathematical formulas. However, if a work contains numerous mathematical expressions, a consecutive numbering of the formulas is expected.

Only abbreviations unknown to the reader shall be listed in alphabetical order in the **list of abbreviations**. This includes all abbreviations not explained in the Duden. In addition, the abbreviations must be explained in the text. This is done by spelling out the expression in question when it is first used and adding the abbreviation in round brackets.

When working with extensive mathematical contents, a **symbol directory** is to be created in which all symbols used are to be included. The symbols should be used in the same way as in courses in order to avoid misunderstandings. When editing, the symbols should be used uniquely, i.e. no symbol should be used for multiple expressions, while no expression should be abbreviated with different symbols.

Footnotes

All essential contents are to be presented in the text. Only marginal remarks and less important additions may occasionally be included in a footnote where this improves the reading flow. However, this procedure should only be used in **doses**, so as not to force the reader to constantly read the footnotes "in parallel". Under no circumstances may statements of central importance be made in footnotes alone, as this would suggest that a corresponding approach is intended to circumvent the limitation of the scope.

Bibliographies and affidavits

The bibliography shall include all the materials used to produce the work. Specific information on the handling of literature can be found in Section 5 of these guidelines.

Seminar, bachelor and master theses must also be accompanied by an affidavit stating that the researcher has written the thesis him/herself. An example of the affidavit can be found in the Appendix.

Appendix

The Annex provides a place to present **complementary elements** for validation or better understanding of the results of the scientific work. Here, for example, particularly detailed explanations of statements made in the text, questionnaires or discussion protocols, as well as the complete results of empirical surveys or simulation experiments can be recorded. The minutes of interviews must include the name and first name of the interviewee, his or her function and associated organisation, as well as the place and date when the interview took place. If the interviews are to remain anonymous, ID numbers or pseudonyms can be used.

For empirical surveys and simulation studies, the data sets and/or the program code should be provided on an **electronic medium**.

It is important for the content of the Annex that no essential elements of the work are moved to the Annex. However, if the annex is useful, it should also be **referred to in the relevant passages of the paper**. On the other hand, the annexes must not be filled with representations that are only related to the subject in the broadest sense. If there are no facts of corresponding relevance, the annex can even be omitted completely.

Where the Annex contains several figures or tables, they must be **numbered A.X (i.e. A.1., A.2, etc.) in the part of the text, irrespective of the census, and** included in a separate list (list of Annexes) at the beginning of the Annex.

Frequent errors in construction

FREQUENT ERRORS	RECOMMENDATION
⊗ The introductory chapter of the thesis lacks a description of the problem. The subject area and the interest in knowledge are not defined or not sufficiently delimited. Instead, only general or historical data is provided.	☺ <i>Guidance on the relevance of the topic and the research question in the introduction. Help: Browns' 8 Questions as preparation, answering the question: For which applications and in which area is the question relevant?</i>
⊗ The course of the investigation is not described and not justified.	☺ <i>Presentation of the course of the investigation (Section 1.2.)</i>
⊗ The work is not logically structured.	☺ <i>Checking for logical work sequences (red thread), if necessary with a process sketch.</i>

- | | |
|---|---|
| ☹ The work shows redundancies in content. | ☺ <i>Check for redundancies in the work. Help: Is the same thing described several times in other words? Avoid this.</i> |
| ☹ The headings are not chosen in relation to the facts discussed, but according to the outline logic (e.g.: "model", "theory"). | ☺ <i>Meaningful headlines, structure as "story" of the work. Assistance: What happens in the part of the work? (e.g.: "Principles of cost accounting", "Development of the cost accounting model").</i> |
| ☹ Frequent reference is made to the following text sections. | ☺ <i>Explanations are necessary when a problem is addressed for the first time.</i> |

(Please note: This list is not exhaustive and is intended only as a guide.)

5. Dealing with scientific literature

literature <hr/> Important aspects at a glance	Appropriate use of technical literature Adequate foundation with literature in the sense of the task Sufficient use of journal articles (at least 60%) No use of unquotable material Use of primary instead of secondary sources
	plagiarism testing No plagiarism in the text All statements, texts and ideas taken over were occupied accordingly with literature
	Quote Only exceptional use of literal quotations (rule: max. 3 literal quotations) Use of analogous quotations in own words

Figure 4 Overview: Evaluation criteria for dealing with literature

The handling of literature is one of the central requirements for the preparation of scientific papers. It is important that the author deals with approaches and opinions of other authors. On the one hand, existing knowledge and studies should be built upon, on the other hand, the ideas of others should be protected and therefore proven. This section is intended to support the handling of scientific literature: In the first part, the usual **types of publications are** described and the relevance of journal articles is pointed out. In the next part **methods of literature search** are described. **Sources are** then listed where relevant literature can be found. Afterwards useful **tools are** recommended, which support and simplify the literature administration and citation. Finally, the topic of processing literature (**quoting**) is described in detail.

Types of publications

There are different types of publications in the research landscape. Prominent forms of publication are: Journal articles, books, conference papers, research papers and working papers.

Journal articles should form the basis of this work:

At least **60%** of the sources cited in a scientific paper at our institute should be **journal articles**. Compliance with this rule is included in the evaluation.

Journal articles have a high value in research, as they usually undergo an extensive review process before publication, and their content is thus considered to be accepted by the research community.

Books are generally basic literature and can be used primarily for the basics. There are also **edited volumes which**, via book chapters by different authors, convey different perspectives on a common research topic. **Conference proceedings** are usually also subject to a review process. These types of publications may also be processed in scientific work.

However, **research papers** and **working papers** are not subject to peer review and may be published by any institute without review. They record an interim status in a current research project and should therefore only be processed in exceptional cases.

The use of **English literature** is permitted. Publications in other, foreign languages should only be used in justified exceptional cases due to the difficulty of understanding the contents.

Literature search methods

Before dealing with the processed literature, the possibilities of literature search are briefly described. These are often not fully exploited and important sources are therefore overlooked. The methods presented are suitable both for in-depth literature research after the topic has been defined and for finding sources for a first "cross-reading", which should precede the definition or delimitation of the topic.

A distinction must be made between an unsystematic and a systematic approach to literature searches. The **unsystematic search** is characterized by the fact that the literature is determined on the basis of the source references of similar existing elaborations. Such an approach can be useful as an introduction, as it leads to quick results. Due to the inherent danger of this method to identify only a part of the relevant literature, the unsystematic literature search should only be used in an early phase of the processing and then be extended by a systematic search.

In the **systematic search**, the existing literature is determined with the help of keywords, further factual and temporal limitations, as well as directories from databases. A distinction must be made between literature search in the reference holdings, interlibrary loan and research in electronic media (see next section).

Sources for literature search

The search for literature in the **reference holdings** of the University Library via the Internet is particularly easy. The following search mask is available at TUHH for this purpose:

[TUBfind https://www.tub.tu-harburg.de/finden/](https://www.tub.tu-harburg.de/finden/).

If the sources are not available locally, **interlibrary loans** can also be used to access literature that is available in other libraries. Through the joint library network, for example, books and periodical holdings in various university and state libraries can be accessed. Access is also possible via *TUBfind*. Please note that it may take several days for books from other libraries to arrive when interlibrary loans are made. Therefore, the literature search should be started at an early stage.

Finally, *TUBfind* can also be used to access **online databases of journals** to which the TUHH has access rights (Attention: access only possible via the university network or VPN connection).

In addition to the TUHH databases mentioned above, it is helpful to review the tables of contents of current journals and newspapers in order to find articles that are not categorized. This is possible in other **online literature databases** via the Internet. The following literature databases are recommended:

- *EBSCO* <http://www.search.ebscohost.com>
- *Science Direct* <http://www.sciencedirect.com>
- *Google Scholar* <http://scholar.google.de>

In principle, a search via the university network or VPN connection with the TUHH is always recommended so that the protected contents to which the TUHH has acquired access rights are displayed in the search.

The increasing use of electronic media has led to an increasing use of **Internet sources other** than journals and the like for scientific work. In this context, we would like to point out that the information researched on the Internet must also meet the requirements of scientific work. Thus, it must not be assumed that data published on the Internet are always of the highest topicality, since pages are partly only rarely or not at all maintained. In addition, it is essential to verify questionable information. In addition, a clear provability is necessary also with electronic sources.

Tools

For the administration and use of collected literature it is recommended to use **software for literature administration**. This software usually offers the following functionalities (among others):

- 1) Import of found publications from the literature databases into a local database with just a few clicks.
- 2) Management of the literature in the local database with possibilities of adding own keywords, comments, and files.
- 3) Processing of the literature in the word processing program and generation of the bibliography in the scientific work.

A popular option is *Citavi* (<http://www.citavi.de>), which is freely usable in the basic version and has all the above-mentioned functionalities. *Endnote* (<http://endnote.com>) is a widely used tool for professional use, but is subject to a fee. *JabRef* also offers open source literature management in BibTeX format (<http://jabref.sourceforge.net>).

In addition to the literature management software mentioned above, the creation of mind maps and a structure of the scientific work on the collected literature and quotations with *Docear* can be very helpful in the content processing of literature (download and introductory video on: <https://www.docear.org>). Further software to support the effective organization of literature and thoughts is the "Zettelkasten" (english: *Notebox*) <http://zettelkasten.danielluedecke.de> and *KeepNote* (<http://keepnote.org>).

Quote

If the content read in the literature is not properly processed in the scientific work and the source is stated, there is a risk of plagiarism. One speaks of **plagiarism** when one uses the intellectual property of another as one's own achievement without making the origin obvious.

If a case of plagiarism is found in a scientific work, this work is considered as not passed!

To check the scientific work for plagiarism, an access to a plagiarism software is available (*Turnitin*). However, this only offers assistance. The existence of a plagiarism is determined by the evaluation of the employees and the professor.

To avoid plagiarism, it is important to become familiar with the tool of citation. This method ensures that the knowledge of others is protected and marked as such. This part of the guidelines deals with the **methods of citation**. Later, in Part 6, the **formal requirements for citation and the bibliography are discussed**.

Meaning and literal quotation

In the case of an **analogous quotation**, the content of the found document, but not its wording, is reproduced and provided with the source. When implementing the analogous quotation, care must be taken to ensure that the rewording goes beyond the mere amendment of the original sentence structure¹. Here the author is to process what he or she has read in his or her **own words**. The application of the analogous ci-

¹ Note: When using sequences of words from the original source (so-called "*strings of words*") without identifying them as literal quotations, a plagiarism already exists in the strict sense, since the wording is not marked as having been taken from the original source, but is adopted as a separate wording.

tation shows that (or whether) the content was understood. In addition, the literature should always be processed in the best possible way with reference to the research content and problem of the author. This form of quotation should therefore be used in principle.

A **literal quotation gives the** exact wording of the source under exact indication of the reference. This makes sense if something central has been formulated in such a way to the point that one wants to build on it unadulterated. It should be noted that too extensive or too frequent a literal quotation, especially a sequence of literal quotations, can give the proofreader the impression that the author has edited the literature but has not reflected it sufficiently. In addition, literal quotations can hinder the logical structure of a text, because important connections such as causal links are difficult to insert.

Literal quotations should therefore only be used in exceptional cases.

They can also be used to use short quotations in a foreign language (English or French) in the original version. Longer quotations in foreign languages, on the other hand, must be translated. The foreign-language text shall be included in the footnote.

Particular attention should be paid to text passages in which linguistic errors are found or which, taken on their own, make references unclear. In these cases a correction or addition by the author is necessary. The latter shall be enclosed in square brackets and accompanied by the words 'Erg. d. Verf.'. to provide. If, on the other hand, the quoted text is erroneous, the error must be indicated by the addition "(sic)" in the reproduction of the original. This is necessary so that no incorrect citation is assumed during correction.

Original and secondary sources

In principle, the **original source must be cited**, i.e. the publication which first presents the facts of the case or in which an opinion is expressed for the first time. In this respect, work with secondary sources, i.e. citing sources from other sources, should be avoided. Only if the original source is not available can secondary sources be used. This should be indicated in a suitable form, e.g. by the addition "quoted after" before the secondary source is indicated.

Book edition

It is also important to always work with the **current edition of a book** and to quote it. This is unavoidable simply because the view of an author or empirical data may have changed. If in exceptional cases the current edition is not available, it should be indicated in the footnote in an appropriate form. However, it is possible to use a specific

edition if it contains specific content that can no longer be found in other editions or in the desired form.

Figures and tables

The principle of source attribution also applies to figures and tables. The source is always indicated in the **caption of the figure or table. Under** certain circumstances - e.g. when obtaining data from several publications - several sources must also be cited.

If own elements have also been included in the representation, the addition "*Following*" is to be placed before the source reference. Only if the author has not used other publications when creating the figure or table may the source reference "*Own presentation*", "*Own reasoning*" or "*Own survey*" be used.

eBooks/eJournals

In the event that an eBook or eJournal is to be cited that has been published without page numbers, the relevant section should be marked as clearly as possible (subchapter and paragraph, if applicable).

Quotes in presentations

Also in final presentations, the corresponding literature to which the content refers should be quoted and a bibliography should be given at the end. This applies to the presentation of all scientific papers, i.e. also to the presentation of project seminar papers.

Frequent mistakes in dealing with literature

FREQUENT ERRORS	RECOMMENDATION
☹ Statements are often not substantiated. This is particularly noticeable when empirical data is used that the author cannot have collected himself. The literal acceptance of literature sources without a source reference can lead to rejection of the work or to other sanctions.	☺ <i>Citation and occupation of all statements, ideas and materials which were read in other sources and taken over in the work.</i>
☹ Almost exclusively (teaching) books are cited or no high-ranking (international) journals	☺ <i>Processing of current journal articles (at least 60% of all</i>

- are integrated into the search.
- ⊖ The literature search is only conducted superficially. Important opinions and authors are not quoted.
 - ⊖ Secondary sources are used on a large scale, i.e. the primary sources are not used. Content errors can be the result.
 - ⊖ Non-quotable materials such as transcripts, scripts or Wikipedia are used and cited as sources.
- ⊕ *Extensive literature research in the described databases and processing of the literature in the scientific work (if necessary, preliminary work with mind maps).*
 - ⊕ *Review the primary source and cite it for the appropriate statement.*
 - ⊕ *Use the above publication types; only in justified exceptional cases use other, reliable sources (e.g. for statistics).*

(Please note: This list is not exhaustive and is intended only as a guide.)

6. The form of a scientific work

Form Important aspects at a glance	citation style Use of a uniform citation style Quotations formally correct References formally correct and complete
	form specifications Compliance with the specified font, font size, margins, etc. Readability of tables and graphics Scope of work within the given framework
	Language Formal correctness (spelling, punctuation, grammar) Expression (clear and precise language, appropriate use of technical terms, language level)

Figure 5 Overview: Evaluation criteria for the form

On the following pages you will find **binding information on formal design**. These range from information on the copy and page design to formatting questions and the presentation of the required spelling. In addition, the formal requirements for citing literature are described.

On the one hand, the formal guidelines guarantee the **clarity** of the work. On the other hand, only precise rules can ensure that the work submitted is **comparable** in terms of its scope.

Citation style

A uniform citation style for all scientific work must be chosen for the processing of literature. The widely used **APA citation style** of the *American Psychological Association (APA)* is recommended, see: <http://www.apastyle.org>. Alternatively, the **DGP citation style** (citation style of the German Society of Psychology) can be used for German work.

The recommended use of a literature management software will support the consistent implementation of the citation style. The widely used APA style is pre-installed in the usual platforms. If necessary, other styles can be installed for use. It is requested to refrain from numerical citation, as it is usual in natural science subjects.

Form of the sensual and literal quotations

When implementing the **analogous quotation**, the reference to the source is placed at the end of the sentence if the quotation refers to the entire sentence or half-sentence. If only shorter sections or even individual expressions are to be used, the reference must be placed after the last word.

When referring to a specific part or statement of a publication, the corresponding **page number of the source is given**. The page reference should be as precise as possible. For this reason, it is particularly important to refer to references such as "ff. (following pages)". Instead, the area in question should be narrowed down by specifying the first and last pages. However, if a source only refers to two consecutive pages, the mention of the first page and the addition "f." are sufficient. (next page). Otherwise, the reference to the publication as a whole is sufficient if one refers to the overall result or statement of this publication.

If several references to a statement (sentence) are used, they must be separated by a comma.

If **more than two authors** are involved in a publication, the entry may refer to the first and the addition "*et al.*". (et alii). However, all authors must be listed in the bibliography. If several authors have an identical last name, the abbreviation of the first name - separated by a comma - must be used.

When **citing repeatedly**, an abbreviation of the source is allowed. If quoting from the previous source, the source reference can be reduced to "*ibid*" or "*Cf. ibid*". However, the number of pages shall be indicated. However, it should not be quoted too often from the same source, as this gives the proofreader the impression that not all the existing literature has been included in the editing.

In the case of the **necessary reproduction of longer passages**, it may be advisable to point this out by means of an introductory remark (e.g. "*Cf. to this and in the following*"). Then it is assumed that the following area or paragraph refers to this source. It should be marked best possible which area was taken from this source (i.e. when this area ends). In no case should the reference be inserted at the end of the entire range, since in this case no differentiation from the reproduction in only one sentence is possible.

If a source is quoted **verbatim**, the text must be enclosed in quotation marks and italic: "*text*". A literal quote always requires the page number(s) of the source where the quote can be found. Single quotation marks shall be used for quotations within literal quotations ('...'). Special formatting by the author must always be retained. Omissions in the original quotation shall be made clear by bracketed dots (...).

Form of the bibliography

All references must be listed in **alphabetical order in the** bibliography. When using a software for literature management, this is automatically generated from the references in the text. Here are some additional notes on formatting:

- If an author has several publications in one year, the year of publication is supplemented with an alphabetical numbering.
- All authors of the publications are to be named in the list.
- It is not necessary to specify the page numbers used here.
- In the case of an anthology, both the contribution and the anthology should be cited as separate sources in order to facilitate the search in the bibliography. However, series of publications shall not be listed separately.
- In the case of references to electronic sources, the reference to the URL (<http://www...>) and the retrieval date (dd.mm.yyyy) shall be included. The pages or a printout of the pages should be saved.

Page and font format

In this part of the guidelines some **format requirements are made, which are** to be followed with the production of the scientific work. Compliance with these requirements is also included in the evaluation.

It is the "Times New Roman" font in size 12pt to use. The line spacing should be 1.5. The text should be in justification. There should be a sufficient correction margin, 4 cm on the right and 2.5 cm on the left. The upper edge should be 2.5 cm and the lower edge 2 cm.

The work shall be numbered consecutively. An additional distance of 6pt should be set in the text body for paragraphs. Headings shall also be formatted in a font size of twelve points. An additional space of nine or six points should be added before or after headings.

Footnotes must be created in the same font, but with a smaller font size (10pt). Each footnote begins with a capital letter and ends with a dot. If the footnote ends with an abbreviation at the end of which there is already a point, no further point is required. For reasons of clarity, a tabulator should be inserted so that the footnote texts are flush even if the number of footnotes changes from one to two or from two to three digits. The footnotes shall be formatted in justification without line spacing and numbered continuously with Arabic numerals.

Spelling, grammar, word choice and punctuation

Good scientific work is characterized by a **high degree of accuracy and comprehensibility** as well as a **concise and confident style of language**. Particular attention should be paid to the following points:

- When preparing the work, the regulations of the new German orthography must be observed.
- Options, such as punctuation, shall be applied uniformly.
- Colloquial expressions are only permissible in absolutely exceptional cases, e.g. to describe a situation succinctly.
- A neutral, objective style should be used that clearly separates facts from evaluation and opinion. Valuable statements or "advertising style" are not appropriate.
- The style should be largely impersonal, i.e. phrases such as "I" or "the author" should be avoided.
- The excessive use of bullet points should be avoided, rather the points should be formulated in sentences or paragraphs. Only in the case of enumerations should appropriate reference be made to key points.
- Filling words and phrases are to be avoided. This also applies to relativisations such as "determined", "certain" or "right".
- Despite numerous examples to the contrary in the literature, the sentences should not be longer than three lines. I.e. not, that alone main sentences are to be strung together. Rather, forms of subordinate clauses can be used to vary and in this way the linguistic representation can be made interesting and varied.
- References must not be misleading. This danger exists in particular if reference is to be made to one of several objects in a preceding sentence.
- Single numbers up to twelve must be put out to tender. This is not the case for numbers with decimal places or the description of technical contexts.
- A chapter should consist of at least three paragraphs. A paragraph should consist of at least three sentences.

Figures and tables

Illustrations and tables serve to clarify contexts and to present data in a compressed form. **Graphics do not replace text but illustrate the content.** The corresponding content should therefore be reproduced in the continuous text. They can also contribute to the interesting design of a work. It should be noted that there should be a connection with the textual content which can be particularly well established by **references in the text** "... (cf. Figure 10) ...". The inscriptions on figures and tables should be short, i.e. preferably in one line, and should always end with a dot.

There are also **formal requirements** for figures and tables. These concern, among other things, the print quality. It is strongly discouraged to display scanned images. Several printing and reading processes often lead to a significant loss of quality or even illegibility. It is also important that illustrations are labelled.

The graphics should also be legible in black and white. Illustrations should not be displayed in continuous text. The text is to be positioned without text wrapping.

Paper quality, size and copies

With regard to the paper quality, no special features are to be observed. For example, it is not necessary to print the work on particularly heavy paper (> 80g/m²). When binding, however, the cover sheet and the last sheet should be made of sturdy cardboard to prevent the sides from buckling.

Master theses must be bound. A complex book binding is not necessary, however. Instead, a simple thermal binding is sufficient.

The **extent of the work** is very roughly given (*! please note the restriction for project seminar work, next paragraph*) with **60 pages +/- 20%**. You should clarify the length with your supervisor, since the number of pages required depends on the content and design of the work. Significant deviations, such as may occur in empirical studies, should be discussed in advance with the supervisor. Work that is clearly too short as well as clearly too long compared to the agreed length leads to a poorer evaluation.

The **scope of project seminar work** is stricter with a **limit of 14-16 pages with no room for negotiation**. The number of pages refers to the content of the work (introduction to final chapter). The appendix serves to provide additional information about graphics, tables, data sets, program code, etc. as required. Relevant content should not be outsourced there.

Frequent errors on the form of work

FREQUENT ERRORS	RECOMMENDATION
⊖ In the bibliography, unquoted literature is mentioned. This may particularly be the case if text passages with references have been shortened beforehand.	☺ <i>Use literature management software that only inserts references contained in the document into the bibliography.</i>
⊖ The bibliography is incomplete, i.e. parts of the literature mentioned in the references are not listed.	☺ <i>software for literature management, which only includes references in the bibliography that are also contained in the document.</i>
⊖ Incorrect or illogical numbering of chapters.	☺ <i>Check numbering. A sub-item may only be created if there is at least one equal second sub-item.</i>
⊖ The minimum number of chapters is not observed.	☺ <i>A chapter should consist of at least three paragraphs. A paragraph should consist of at least three sentences.</i>
⊖ In the work there are frequent violations of rules of spelling and grammar.	☺ <i>Ask fellow students, friends or family for a critical review of the work before submitting.</i>
⊖ Poor print quality of the graphics or tables used.	☺ <i>For graphics use scalable formats without loss of quality, e.g. pdf. Do without scans, better rebuild the graphics yourself and include the source in your work.</i>

(Please note: This list is not exhaustive and is intended only as a guide.)

7. Further literature

American Psychological Association (2011). Publication Manual of the American Psychological Association. Washington, DC.

Bem, D. J. (2002). Writing the empirical journal article. In Darley, J. M., Zanna, M. P., & Roediger III, H. L. (Eds) The Compleat Academic: A Career Guide. Washington, DC: American Psychological Association.

Field, A. P., & Hole, G. (2003). How to design and report experiments (p. 153). Los Angeles, CA: Sage.

Murray, R. (2011). How to write a thesis. McGraw-Hill International.

Nicol, A. A., & Pexman, P. M. (2010). Presenting Your Findings: A Practical Guide for Creating Tables. An educational guide based on the Publication Manual of the American Psychological Association. Washington, DC: American Psychological Association.

Theisen, M. R. (2012). Scientific work: Technology-Methodology-Form. Vahlen.

Scripts, websites and blogs

TUHH, Library blog on scientific work <http://www.tub.tu-harburg.de/wissenschaftliches-arbeiten/>

TUHH, Online tutorial scientific work <http://www.vision.tu-harburg.de>

TU Munich, Research Methodology for Engineers http://www.pe.mw.tum.de/fileadmin/w00bft/www/pdf/skript_forschungsmethodik_ingenieur.pdf

Writing advice

TUHH, Consulting services for the management of writing projects <https://www.tuhh.de/tuhh/studium/ansprechpartner/studienberatung/schreibberatung-beratung-zum-management-von-schreibprojekten.html>

Appendix

Annex 1: Affidavit

Name:

First name:

Affidavit:

I hereby declare, under oath, that I have read and agree to abide by the conditions set out in the

Master thesis/seminar thesis

independently and without the use of any aids other than those indicated.

The thoughts taken directly or indirectly from external sources are marked as such.

The work has so far not been submitted in the same or a similar way to any other audit authority and has not yet been published.

Place, date:

Signature: