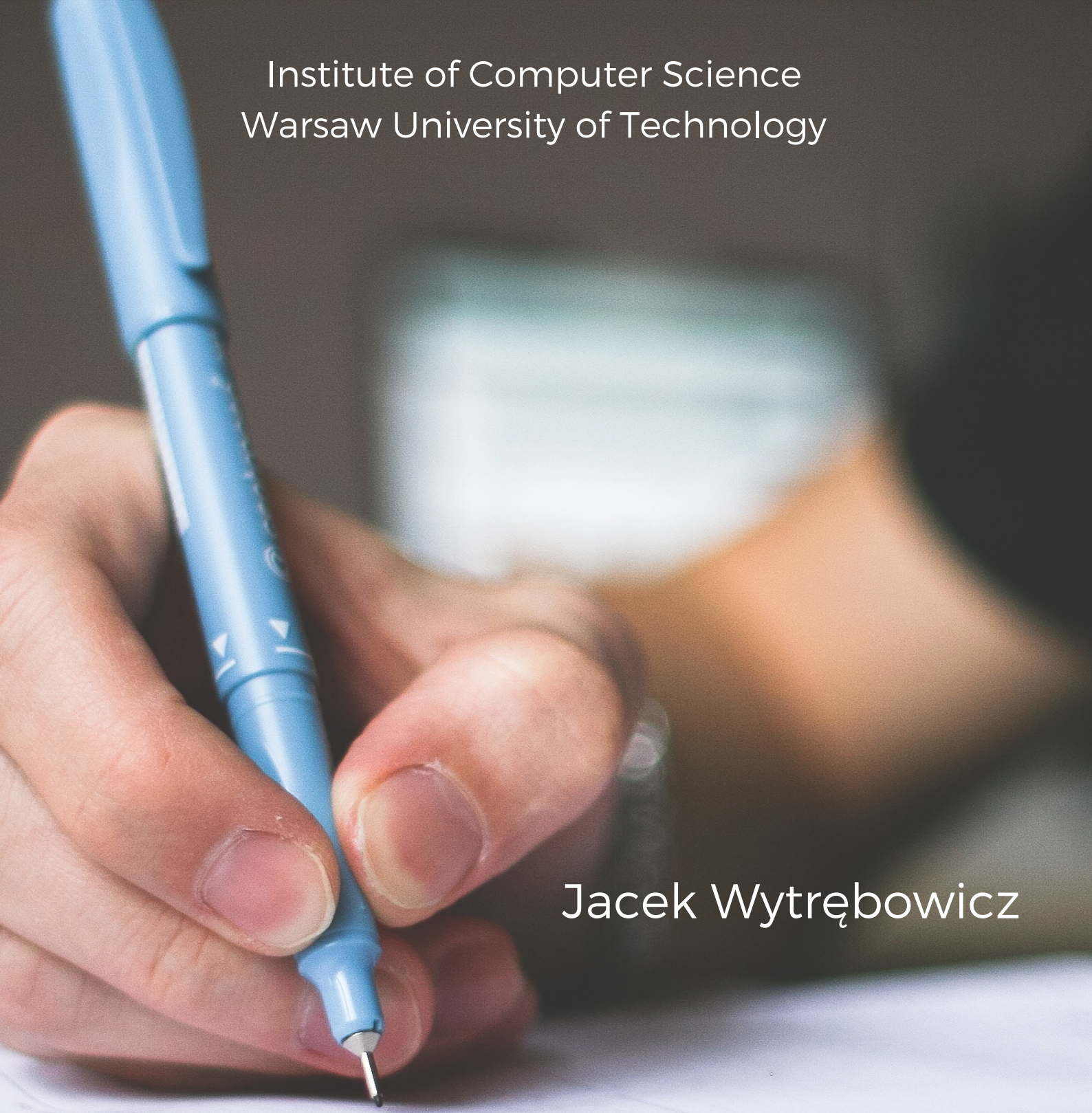
Institute of Computer Science
Warsaw University of Technology



Jacek Wytrębowicz

HOW TO WRITE A GOOD THESIS

SOME TIPS

Addressed to students
of technology universities

How to Write a Good Thesis – Some Tips

Jacek Wytrębowicz

Institute of Computer Science, Warsaw University of Technology

November 2018

Abstract

This short document is addressed to students of technology universities. It provides some advice that could be helpful in writing a diploma thesis. The hints are related to general content of a thesis, its composition, language style and edition issues. Most of the remarks are also applicable to the writing of technical reports, conference papers and articles to scientific journals.

Contents

1. Are the Tips Important? 1

2. Content of a Thesis 2

3. General Rules 3

3.1. Composition of the Thesis 3

3.2. Comprehensible Writing 5

3.3. Language Style 6

4. Editing Tips 8

4.1. Structure 8

4.2. Fonts 8

4.3. Figures, Tables and Listings 9

4.4. References 9

5. What to Read More 10

6. Ending Remarks 11

Bibliography 12

Useful or Interesting Links 12

1. Are the Tips Important?

There are many books on writing technical and scientific papers. Every student can and should select one of them, and deepen her/his knowledge. Here, in this short document, I have collected some recommendations and hints I give to my tutees as well as some comments that I annotate their work with.

Why do I think such document could be helpful? In the past, students could learn proper writing from all published technical books and scientific papers. Unfortunately, it has changed. Once, publishers employed editors and copywriters with technical knowledge, as well as typesetters. I remember being paid as a referee in the editing process. Today, the

responsibility for the quality of a text is very often ceded to authors and referees. Formerly, authors were paid for their published documents; nowadays they are generally not rewarded. There are more and more publishers who incentivise the authors to participate in publishing costs. The referees are recruited as volunteers. They are found at universities owing to their interests in a given subject and for a promise of respect. A scientific paper can be written in English by a Chinese student and reviewed by Turkish and Brazilian lecturers, with none of them being fluent in English, and such a case would not be an exception. As a consequence, the reading of today's scientific papers can be destructive for our knowledge of proper English. We should be careful putting our trust in linguistic quality of the paper we are reading, and even sceptical about its content. The reason for defective content of a work can lie in the time pressure imposed on the author, in the reviewer's lack of time and sometimes lack of sufficiently deep knowledge on a given topic. Another cause can be the publisher's problem with acquiring a required number of high-quality articles for an issue of a journal.

Moreover, we can observe the growing number of semi-technical and pseudo-scientific papers, which are easily distributed via the Internet. Most of them are published by advertising and sales departments of different enterprises. There are articles written for fun or even in bad faith (e.g. to supply a conspiracy theory). Evidently, such papers do not provide good patterns for writing a technical paper.

Due to the rationale given above, students should deliberately learn how to write a fine scientific paper. They should also know the difference between a scientific journal and a technical magazine for practitioners. The two kinds of periodicals differ in the target audience, in linguistic style and the purpose of publication. The editors-in-chief describe it explicitly in their notes for authors, e.g. the note from IEEE Software [1].

I hope this document will be helpful for students of technical faculties, struggling with writing their diploma thesis or articles. Even though it focuses on writing in English, it can be instructive for those who write in other languages, too. I grouped my hints and remarks in the five following sections. The first one outlines general content of a thesis. The second one is related to the composition of a thesis and writing styles. The third one contains editing hints. The forth points to some bibliography related to academic writing, and the last one gives some final remarks and concludes this document. At the end, I have added some links related to the correctness of English technical writing.

2. Content of a Thesis

A diploma thesis constitutes a kind of scientific publication, and for that reason there are some expectations for its content, language style and format. These expectations have been formed by scientific writings over centuries and years. Technology (from Greek τέχνη – "science of craft") differs from natural and social sciences in that the subject of interest is located in the future and not in the past or present time. Sometimes when we think about new technical systems or about future techniques we can do some simulations, or we are able to infer the results from mathematic calculations. However, most often we build a prototype as a proof of concept, and we subsequently test it in a real or simulated environment.

The general structure for articles in experimental sciences is: *introduction, research method, obtained results, discussion* and *conclusions*. If the goal of the thesis is to analyse and

compare a set of technical solutions then the above layout could be followed. However, there are many other goals, e.g. to find appropriate architecture for a given technical system or to prove a concept of a technical solution. In those cases, other structure is applied, i.e.: *introduction, problem definition, solution analysis, obtained results* and *conclusions*. If the student's work includes some software or hardware development, then:

- *solution analysis* part should describe project analysis and applied tools,
- *obtained results* part should describe the implementation and tests of the designed solution.

The majority of research problems are analysed by many teams. The number of articles on any subject is often overwhelming. In any case, we should know some related works, at least those which have been released recently, and mention them in the respective parts of our thesis. If a given paper influenced our research method, then in this context it should be cited. If we can compare our results with others, then the *obtained results* part is appropriate.

It is highly probable that another team or student will work on the same subject and will read our thesis. We should provide them with sufficiently detailed description to enable all our work to be repeated with the same results.

The rules given above outline the thesis structure. Expectations for the goal of a thesis, its content and scope strongly depend on the research domain and the degree to be achieved (B.Sc., M.Sc. or Ph.D.) In all cases, the content of a diploma thesis is discussed in detail with the student tutor. Therefore, let the tutor be the guide through the possible choices of the content parts. The student's responsibility is to do the required research, development work and to write a valuable book. The next section provides some general rules that can help in writing one.

3. General Rules

A scientific paper should be comprehensible, precise and concise – this rule is repeated like a mantra in many handbooks and by university teachers alike. Obviously, the paper has to express the truth. It is unacceptable to mislead a reader be it intentionally or unintentionally. The author must carefully check all the presented data and verify credibility of information sources. He or she should neither present any supposition as a truth, nor give personal opinion as an objective fact.

There is one aspect that often turns out to be omitted by teachers and handbooks: a written paper should be interesting. Of course, not every reader would be interested in a given subject. Sometimes, not to disappoint the reader, the author should specify the expected audience or the knowledge it should have. However, an interesting subject will not be enough for a discerning reader; the text should be also written in an interesting style. What makes a text interesting is the way of its composition and the style of the language – neither feature is easy to master; each can be a subject of study.

3.1. Composition of the Thesis

There is a rule that often helps the author to keep the narration of a technical document more engaging. The author, while describing a given subject, can follow the order of four questions

“why”, “how”, “what” and “final what”. To awaken the reader’s interest, we should explain: “Why is the subject important?”, “Why are we interested in it?” or “Why should the reader learn about it?” Next, to hold the reader’s interest, one or several stories may be provided: “How has the subject been treated by others?” and “How can the problem be solved or processed?” Further, we can give the reader more detailed information: “What are the details of the subject?” or “What have we done?” or “What have we obtained?” Finally, we should conclude: “What are the consequences of our work or of the presented facts?”, “What are the differences between our expectations and results?” and “What can be or will be done further?” The rule of four questions can be applied not only to the entire paper, but also to each specific subject elaborated in one or more chapters.

One of the features that make a text agreeable in reading is its smoothness of narration. The reader should not be surprised by the existence of a paragraph while glancing through it. The sensation from the perusal should not in any way seem like going on a bumpy road. The subsequent subjects should be logically connected, introduced in a certain way. There are three rules that help to get a smooth narration: have a goal, manage the order and glue the issues.

Have a goal: The student has to define a goal (a thesis) upon embarking to write a diploma thesis. The goal can change a bit during the work, but all the time it should direct the narration. Every considered issue should be related to the goal. The selection of the issues to be described, in what detail and from which angle they are to be approached, should be directed by the defined goal.

Manage the order: Every chapter contains a sequence of paragraphs, while every paragraph describes an issue. The author can name the issues and list them. Next, the logical consistency of the list can be analysed. Is there any missing issue? Are they all needed? Is there any redundancy? Is their order logical? After managing the list, the author can easily make up the corresponding paragraphs.

Glue the issues: The first sentence of a paragraph should fit the narration of the previous one in terms of sense and style. The author should bear that issue in mind before writing the first sentence of each paragraph and every time a ready chapter has been read. Sometimes, to glue the issues, it is enough to slightly modify a sentence. In some cases, however, one or more sentences may have to be added.

It is easy to notice that the two activities, i.e. managing the order and gluing, should also be applied to chapters, which are compositions of issues devoted to a specific subject. Even though we already try to organize the chapters in the conspectus that we write before starting with our thesis, it happens that we alter their structure during the work. Moreover, smoothing transition between them is an iterative work.

The last feature I wish to mention, perhaps the most important one to achieve an interesting text, is substantive content. The reader should understand it, should learn new things, and not be bored by already-known issues. The potential reader of a technical thesis is a student or an engineer in the same or similar field as the author. Hence, repeating the content from regular university courses would not be appreciated. If the content is known from facultative courses and the reader could be unfamiliar with it, then it is better to give some literature references than repeat it. If a given matter is new, complex and difficult, then the author should explain it clearly and thoroughly.

I have given three hints in this section: the why-how-what-what rule of narration, the goal-manage-glue rule of writing and the content selection advice. More hints for composition of a consistent and interesting text could indeed be formulated, but let us stop here and take a look how to make our text easier to understand.

3.2. Comprehensible Writing

Writing in a comprehensible way is not easy, mainly due to the fact that natural language is ambiguous and the knowledge of the reader is difficult to estimate. Something that is obvious or unequivocal for the writer may not necessarily be so for the reader. It is hard and time-consuming work to check if our text says precisely what we think, and if it uses terms known by the reader.

A common noun has usually many meanings, and the context of a phrase allows distinguishing the desired one. Sometimes, we define specific meanings for the concepts we are writing about. When we define terms for them, we can use common words or neologisms. A neologism is justified if it helps to be more precise or better understood. If we need several or more terms to define, then a section or a table with terminology description could be placed in our document.

Writers often define acronyms to shorten specific terms which are frequently used in their documents. Today's scientific and technical literature is overloaded by acronyms, which have become a nightmare for readers. It is difficult to remember the exact meaning of acronyms. When we switch from one article to another, the same acronym can signify something different. We tend to read an article or a book in several time slots, while the gaps between them are taken by our own thoughts, telephone calls, scheduled duties or other activities. After coming back to the reading, we often do not remember the meaning of previously defined acronyms – even when the acronyms are widely known. Each three-letter acronym usually has tenths of well-known meanings that can be easily checked on an acronym finder service, e.g. www.acronymfinder.com. My recommendations for an author of a diploma thesis are the following:

- Put a table with definitions of the used acronyms in a place that is easy to access, e.g. after the table of contents.
- Write the full name of a term, not its acronym, if it is rarely used in your text.
- Introduce full name of the acronym on its first occurrence, and also when it has not been used for several pages.

The titles of a thesis and its chapters should be clear and informative. It seems a bit risky to put acronyms in the title of our article or book. If a potential reader misunderstands or does not understand the title, then he or she would not select our text. A chapter title can contain acronyms and terms defined in the abstract or introduction; thus finding a good title for a chapter is easier. However, there is always a need for a compromise between precision and the length of the title.

As a reviewer, I sometimes see chapter titles like the following: introduction, theoretical part, practical part, conclusions. They are neither informative nor interesting. A good title should tell more precisely what is a given chapter about.

The best way to check if our text is comprehensible is to ask some friends or colleagues for a critical review. Opinions and comments obtained in this way could help improving it. Next, it would be nice to add some acknowledgements to those persons at the beginning or the end of our written work.

3.3. Language Style

In place of looking for a definition of technical language style, I describe a few problems listed below. They are related to: respect for the reader, conciseness, the passive voice and self-mention.

Respect for the reader: First of all, scrupulous attention paid to grammar and orthography is a must. Errors of this kind distract the reader, kill any style of narration, hinder understanding and are a manifestation of disrespect for a person reading the text. Hence, using spell and grammar checkers is a necessity, even though they are not perfect. The author should reread his or her text with some delay (one or more days) and correct any errors. The delay helps to see what has really been written. Next, a friend or a professional proofreader can be asked to check the text. However, language correctness is not the only point at issue. When we question a point or argue about something, we should never criticize the person but his/her ideas or solutions. Being impolite to someone appears also rude to the reader. It is also important not to address the reader with “you”. Although, it proves to be common in most kinds of writing and we can witness it in user manuals of technical devices as well as in technical magazines, by custom we do not use the pronoun in question in scientific articles.

Conciseness: The aim is not to impoverish the content; on the contrary, it is to sharpen the meaning of our sentences. Each sentence and each paragraph should be reread in order to find a shorter way of expressing the same content. We can achieve it by removing superfluous sentences or words, by rebuilding some sentences or by replacing a compound statement by two simpler ones. Using short sentences has two major advantages: the reader can easier understand the resulting text, and the author has lower chance to make a linguistic error. However, constructing only short sentences could make a text too monotonous. Let us thus vary their length to some extent.

Passive voice: Using the passive voice leads to longer and heavier sentences. In most cases, phrases written in the passive voice are more difficult to comprehend than those in the active voice. This observation clearly directs us to replace all passive voice sentences into active voice ones. In the past, editors from many scientific journals enforced such a replacement on authors. Today, more and more people state that we should use the passive voice in scientific writing. What is the reason? When we describe objective truths, physical phenomena or actions in which the object is important rather than the subject, then the passive voice comes in use. Some linguists have analysed research papers and the academic dialect, and they have published their findings. It has transpired that the passive voice is much more often used in scientific papers than in others. A naïve interpretation of that observation leads to the following statement: “in scientific writing we should use the passive voice”. The fact is that using the passive voice does not add scientific value to a paper; it just increases the time we need to read and understand it. My recommendation for students is to minimize the number of sentences with the passive voice, while using them to make the narration logical and varied.

Self-mention: From time to time, I get an article or a student thesis to review which is difficult to assess, because I cannot find out what has been done by the author (and what by others) and what are his or her achievements. The origin of the problem is in teaching students the convention of impersonal reporting in scientific narration. Then, it happens that novice authors use passive voice to express their assumptions, design decisions, obtained results and conclusions without pointing the authorship. The authors should deploy self-mentions, at least to help reviewers in their work.

A humble way to provide self-mention is:

- To state by whom something has been done while using the passive voice.
- To use “the author” or “the researcher” as a subject.
- To use plural first person pronouns and determiners (*we, us, our*).

Using singular first person pronouns and determiners (*I, me, my*) is considered by some writers and readers as less humble. However, we can find contradictory recommendations on this issue. The problem is well analyzed by Ken Hyland [2]. He gave several citations from influential style guides; there are two of them:

> In general, academic writing aims at being `objective' in its expression of ideas, and thus tries to avoid specific reference to personal opinions. Your academic writing should imitate this style by eliminating first person pronouns . . . as far as possible. (Arnaudet & Barrett, 1984, p. 73)

> I here with ask all young scientists to renounce the false modesty of previous generations of scientists. Do not be afraid to name the agent of the action in a sentence, even when it is `I' or `we'. (Day, 1994, p. 166)

Hyland’s research (analyses of 240 papers from 10 leading journals in eight disciplines, published from 1997 to 1998) shows that first person pronouns are three times less frequent in articles from the hard fields of science (engineering, mathematics, physics, biology, etc.), than from the soft ones (humanities and social science). Moreover, singular pronouns are not used at all in the analysed articles from the fields of hard science.

A more recent paper written by Katarzyna Hryniuk [3] gives a good overview of other works on expressing authorial self in research articles. She compares papers written in English (as a foreign language) by Polish authors with papers written by English native-speakers. Her work and similar research conducted by other linguists, demonstrate that the writers of English origin more often used ‘I’ than writers of Slavic or eastern origin, who prefer ‘we’ pronoun. Moreover, the degree of self-promotion through self-reference was the greatest in English, followed by German and then Slavic languages.

Obviously, we can observe cultural differences in the narration style. However, academic writing in national languages is susceptible to becoming similar to academic writing in English – as the later has become a scientific lingua franca. Which way of self-mention is more humble, more pompous or more authoritative for today’s young engineers and researchers? Let the young writers decide.

The four rules above, i.e. respecting the reader, writing in a concise way, minimizing number of passive voice sentences and authorship disclosure, are not the only to be formulated. I selected them as the most important. Now, let us take a look at the editing work.

4. Editing Tips

Publishers of scientific journals and organizers of scientific conferences provide detailed guidelines for authors together with formatting templates for popular word processors, like LaTeX and Microsoft Word. Unfortunately, it is not so common to do so for universities, which publish diploma theses; only a few of them provide templates, some just sketch a bunch of requirements for authors. Of course, the requirements differ from one university to another.

The rules collected below could help those students who do not have enough guidelines from their universities. The rules are rather general and not numerous. They are related to document structure, used fonts, included figures and tables, as well as literature references.

4.1. Structure

The number and length of chapters should be balanced. It is quite common that a diploma thesis has three levels of chapters, and the number of subchapters varies from 2 to 7. If a chapter includes only one subchapter, then the reader may have an impression of imperfection or lack of content; thus better not to create such a subchapter.

It is surprising when a chapter or subchapter is shorter than three paragraphs. Is the text of the short chapter important enough to reflect it in the table of contents? The author should rethink the text as a part of the higher-level chapter, or consider elaborating the issue a bit more.

The paragraph length should also be balanced. If a paragraph includes only one sentence, then three questions arise: “Is the paragraph needed at all?”, “Does it describe a distinct issue, or the sentence should be merged with the previous paragraph?” and “Does it describe the issue in a sufficient way?”

If a paragraph is very long, then it is difficult to read. We can ask, whether it describes only one issue that should be put into one paragraph. If it is not the case, perhaps the author should split it into more paragraphs. Otherwise, a bulleted or numerated list should be considered, in order to split the big chunk of text into something more pleasant to the eye. The reader’s eye can lose focus on the line being read when the paragraph is long. Moreover, long paragraphs in technical text are perceived as difficult and may frighten its readers.

The text should be smoothly placed on a page: evenly spaced, with no unexpected white spaces, no orphan or widow lines and no orphan titles. To a large extent, LaTeX tools free the writer from those problems. A writer that uses MS Word should carefully eliminate duplicated spaces. Empty paragraphs should not be used to separate objects on a page; instead, paragraph styles that define the expected margins ought to be applied.

4.2. Fonts

Sometimes we use different fonts to show distinct types of text, e.g. chapter titles or programming code listings. There is a rule to keep the same font and font size for the text of the same type. When we are choosing a font, we have to face the problem of their abundance – there exist so many fonts to choose from. However, not all fonts are available on all devices, and not all fonts cover national characters that we may need. For that reason, it is better to choose old and widely accepted fonts. Moreover, new fonts are often not royalty free. The problem is that the copyright status of a typeface and a font file (that describes it digitally)

varies between jurisdictions of different countries. However, fortunately for the author, it is the publisher's problem.

There are two types of fonts: serif and non-serif. The serif fonts are generally more pleasant to the eye – however, it is so under two conditions: first, the printer (or screen) resolution should be good enough to print (or display) nice serifs, and second, font size must not be too small. If those two conditions are not met, then a non-serif font looks better and is easier to read.

I suggest not using smaller font size than 10-point in the whole thesis, and 12-point size for regular text – just for the reader's comfort. Obviously, the same font size should be applied to the text of the same type.

4.3. Figures, Tables and Listings

Figures, tables and programming code listings are subject to copyright. A given diploma thesis can be treated as a publication or as an internal report for didactic purposes – depending on the university. In the former case, it is not allowed to include any of those objects without permission of the copyright owner. In the latter, it is usually allowed. In both cases, the author of the thesis should specify the source of the included object.

All such objects should be placed on a page inside the text margins. They should not be scaled down making any font size smaller than 9. Otherwise, the reader could be irritated by illegible text.

The titles of those objects should be numbered. We give separate numbering for figures, for tables and for listings. The numbers are referred to in the regular text, where each of those objects should be discussed or presented. It is common that a figure title is placed below the figure. Conversely, the table title is put above the table. If listings are long, then their titles precede them. Otherwise, they are placed below. The placement order should be the same in the whole document.

4.4. References

There are several standards for reference style and bibliography (e.g. IEEE style, Harvard referencing, Chicago Manual of Style). It is very laborious and time consuming to manage, format and keep coherent the references and bibliography. Many tools were created for management and generation of a bibliography, e.g. Mendeley Reference Manager (www.mendeley.com), in order to help the authors.

If the university do not determine the reference style, then the author can choose one of those standardized by well-known publishers. It is important to keep the same style in the whole thesis. The records in bibliography should be informative. They should specify at least: the author's name or names (if known), title, publisher and date of publication. If the referred document is available on the Internet, then its URI could be added to the bibliography record. A bibliography record containing a URI only is unacceptable.

There are two reasons for including references in a text: to help the reader find interesting documents and to prove the author's knowledge. When we see a reference, we should know what it is given for. Does it point to the source of a citation, or to a more detail description of something? What could we learn from the referred document? What is the relation between the described issue and the given reference? Ending a sentence with a reference without giving clear understanding of the reason is a mistake.

There are authors who put some references to Wikipedia pages into their bibliography. Wikipedia is a rich and easily accessible encyclopaedia, from which we can learn a lot. Everybody knows its pages, so is it really necessary to give those references? We expect a thesis to be based on deeper knowledge than purely encyclopaedic one. In general, giving references to any encyclopaedic section is useless – the reader is aware that any term can be checked in encyclopaedias. The only exception is when the author discusses different definitions of a term. In that case, the sources of presented definitions should be indicated.

When we write about related works, then a series of references appears in our text. In such a case, we can vary the style of our sentences to avoid monotonous narrative. There are various styles for making reference to other works. Here are four examples:

- Wytrębowicz [4] argues for a vivid style of narration in academic publications.
- In [4] Wytrębowicz discusses the severe and vivid styles of narration in academic publications.
- Linguistic correctness of publications in science and technology is briefly analysed by Wytrębowicz [4].
- There are severe and vivid styles of narration in academic publications [4].

The sentences above show how to change focus from author to his findings and how to create variety for the reader.

The reviewers of a diploma thesis check if references are given with authorial comments. The comments should be informative for the reader, and they indicate that the author has read the referred documents. The referees also check the scope of publication dates given in the bibliography. The lack of recent publications can imply that the author is unfamiliar with them. The absence of old publications in turn can imply that the author's knowledge is incomplete and based only on a few recent publications.

The conclusion of the chapter is that the quality of references should be taken seriously, as it can strongly influence the assessment of the thesis. Most of all, the bibliography should be helpful for the reader, who selects the thesis as a concise source of information on a given subject. According to the last idea, I point some sources for the readers of this article. The next chapter provides some references to handbooks on academic writing.

5. What to Read More

Every academic library offers books on writing skills. There are universities which offer courses on this subject – however, it is not common on technology universities. Books on "writing in science and technology" are numerous; we can find about 3 000 hits of that phrase on the Amazon bookstore. There are also such books in open access libraries. I can recommend three of them, namely: "About Writing: A Guide" [5], "Writing for Success" [6] and "Writing in College: From Competence to Excellence" [7]. The first handbook gives the basics of composition and revising a thesis, as well as some guidance on English sentence style and grammar. The second handbook provides a comprehensive overview of writing, starting from the basics of grammar, sentence structure, word choice, through rhetorical modes and writing strategies. The third one offers advice for effective organization and expression, rather than basic issues about grammar and paragraph composition.

There is a series of books to help non-native English-speaking researchers written by Adrian Wallwork. The titles state clearly their content: “English for Writing Research Papers” [8], “English for Presentations at International Conferences”, “English for Academic Correspondence and Socializing”, “English for Research: Usage, Style, and Grammar”, “English for Academic Research: Grammar Exercises”, “English for Academic Research: Vocabulary Exercises”, “English for Academic Research: Writing Exercises”.

All the above-mentioned books discuss general academic writing without focusing on papers from the domain of technology. In fact, the only differences between writing in various fields are the content and specific vocabulary. The general rules for scientific writing are the same.

There are many handbooks on academic writing, and it is not easy to select the most useful one. I would suggest looking at those which have been written recently. The reason is that natural languages evolve, grammar rules change and scientific dialect also changes. However, the readers interested in evolution of scientific narration can find inspiring data in older books. An example of a valuable one is Charles Bazerman’s work from 1988
[9], which contains analyses of historical and contemporary scientific papers.

6. Ending Remarks

Every author, of any kind of text, should see the text through the eyes of the reader. How much can the reader’s knowledge be different from the author’s? How many years later will someone start reading the text? It is not easy to perceive our own text through someone else’s eyes, but at least we should try. It is the key to write a comprehensive book or article.

Composing an interesting text is a skill that we can acquire by writing a lot and reading different kinds of books, not only technical ones. There are at least three keys to achieve this skill: practice, practice and practice. It is also worth reading about the art of writing from time to time.

It is expected that academic communication features a rich vocabulary, without slang, clichés and overly general words. Poor language seems to be common in today’s mass media, in marketing articles and technical guides; we are flooded by simple communication. Therefore, using a fine vocabulary is not easy, especially for non-native speakers. An author of a diploma thesis should make effort to display richness of lexis and to avoid repetitions of elementary lexical elements (e.g. be, do, see, give, make, look) in subsequent sentences. Synonym and collocations dictionaries are very helpful in such efforts.

To save time while editing and correcting the thesis, the author should master his or her word processor and related tools, like grammar checkers and bibliography managers. The Internet is a rich source of dictionaries, thesauri and encyclopaedias; there are forums for writers and even on-line linguistic corpuses. We can use web search engines to verify correctness of a given expression or context of its usage. However, the search should be done on linguistically correct pages. We can achieve this by adding to the expression a phrase that limits the search scope, e.g. *cite:www.bbc.com* or *cite:www.bbc.com*. We can use Wikipedia to crosscheck the meaning of a relatively new term by reading its description in different languages. Checking related descriptions in two or more encyclopaedias or other sources is a key to find reliable information.

I hope that the set of tips provided above would be helpful at least for students who start writing their diploma theses. I would be grateful for any feedback that could allow me to make next edition of this document more useful.

I gratefully acknowledge Michał Bocian for the helpful discussions and proofreading of this text.

Bibliography

[1] Steve McConnell, *How to Write a Good Technical Article*, IEEE SOFTWARE, September/October 2002, https://www.computer.org/cms/Computer.org/Publications/how_to_write_a_good_technical_article.pdf.

[2] Ken Hyland, *Humble servants of the discipline? Self-mention in research articles*, English for Specific Purposes, 20, 2001.

[3] Katarzyna Hryniuk, *Expressing authorial self in research articles written by Polish and English native-speaker writers: A corpus-based study*, Studies in Second Language Learning and Teaching, 2018.

[4] Jacek Wytrębowicz, *O poprawności językowej publikacji naukowo-technicznych*, Zagadnienia Naukoznawstwa 1 (179), 2009, https://repo.pw.edu.pl/docstore/download/WEiTI-40f3f324-c438-48f2-bc3d-25fda9029cf2/JWytrębowicz-O_poprawności_językowej_.pdf.

[5] Robin Jeffrey, *About Writing: A Guide*, Open Oregon Educational Resources, 2016, https://open.umn.edu/opentextbooks/textbooks/about-writing-a-guide.

[6] *Writing for Success*, University of Minnesota Libraries Publishing, 2015, https://open.umn.edu/opentextbooks/textbooks/writing-for-success.

[7] Amy Guptill, *Writing In College: From Competence to Excellence*, Open SUNY, 2016, https://milnepublishing.geneseo.edu/writing-in-college-from-competence-to-excellence/.

[8] Adrian Wallwork, *English for Writing Research Papers*, Springer, 2011.

[9] Charles Bazerman, *Shaping Written Knowledge: The Genre and Activity of the Experimental Article in Science*, University of Wisconsin Press, Madison, Wisconsin, 1988. https://wac.colostate.edu/books/landmarks/bazerman-shaping/.

Useful or Interesting Links

Rules for Capitalization in Titles of Articles, YourDictionary, http://grammar.yourdictionary.com/capitalization/rules-for-capitalization-in-titles.html.

5 Most Common Grammatical Errors, YourDictionary, http://grammar.yourdictionary.com/grammar-rules-and-tips/5-most-common.html.

Gender-neutral Technical Writing, by Jean Hollis Weber, TechWhirl, 3 January 2012, https://techwhirl.com/gender-neutral-technical-writing/.

Escape from the Grammar Trap, by Jean Hollis Weber, TechWhirl, 15 April 2010, https://techwhirl.com/escape-from-the-grammar-trap/.

Academic Journals Compared to Magazines, by Dennis G. Jerz, 04 April 2011, https://jerz.setonhill.edu/writing/academic1/journals-compared-to-magazines/.

Online Collocation Dictionary
http://www.freecollocation.com

ozdic - the English Collocations Dictionary online
http://www.ozdic.com/collocation-dictionary/

The British National Corpus
http://www.natcorp.ox.ac.uk/corpus/

Google Books for collocations in published texts
https://archive.org/details/googlebooks