

Anežka Lengálová

How to Write a Research Paper in English

Abstract

The ability to communicate in English is an inevitable part of the skills of doctoral students, no matter where they study. The paper gives a brief overview of the approach to academic writing in general, and more detailed ideas on the process of constructing a research paper.

Keywords: Academic writing, PhD student, journal, research paper, hourglass model, introduction, methods, results, discussion, abstract.

How to Write a Research Paper in English

English is, without any doubt, the lingua franca of today's world, and publishing research results in this language is a must for not only future research workers but for all scholars and scientists [Swales, 1998, p. 96]. Of surprise, then, is that so few universities pay attention to this aspect of doctoral studies. They only concentrate on the expert knowledge, under-estimating the necessity of international communication, and probably communication in general.

At Tomas Bata University in Zlín, Czech Republic, we have chosen a different path. Realizing the importance of being in touch with the international community, we have been training PhD students in communication skills, both written and spoken, for over a decade. The experience gained, together with background, will be the topic of the following text. More precisely, after some general ideas on approaching academic writing, I will focus on constructing a research paper. The other genres used in scientific communication, such as conference abstract, grant proposal, dissertation or monographs will not be dealt with here.

For the beginning it is necessary to state that writing styles vary among different research and academic communities. Thus, students must realize that in the course they will be taught basic principles, but they still must read a number of English texts

from their discipline so as to get the feel of the particular style used there. Even more specifically, they need to adapt and adhere to the writing style in the journal in which they intend to publish.

Nevertheless, there are some common principles which should be followed, no matter what field the text covers. First, academic text must be precise, not allowing any double meaning. Second, it should be concise, i.e. express the exact ideas in as few words as possible. Then, it should be comprehensible – readily understandable. Last but not least, it should be consistent, i.e. adhering to the same rules.

To apply these principles, students (or authors in general) must first be sure how to approach academic writing. Swales and Feak in *Academic Writing for Graduate Students* recognize various aspects the author must consider in the process of writing. These are: audience, purpose, organization, style, text flow and presentation [Swales and Feak, 2004].

First, the author must be sure for whom he/she is writing, i.e. The **audience**. Experts, peers or the general public? Academics or laymen? Where do they desire to publish the text? This affects all the following steps and points of view in the text creation. The key is to know how much knowledge is possessed by those who will read the publication.

The second aspect is the **purpose**. The author may have various aims; the approach will differ if he/she intends to inform, to persuade, to entertain, to explain, etc. In each of these cases, the author will use different strategies (and different language means) to reach the goal. The strategies reflect in the **organization** of ideas. There are a number of predicted patterns of organization, e.g. in the research paper, which will be discussed later, certain types of information are given in different sections. A simple example of organization is a recipe – first the ingredients are given, then the process of cooking with these ingredients is described step by step.

The previously given aspects influence the **style**. As a rule, the style in academic writing is formal, which can be identified both in vocabulary and grammar. The expressions used are exact, often technical terms, verbs are more specific (not phrasal verbs), and sentences are generally more complex than in the informal style. In formal writing, it is necessary to be objective, not to show any emotions, not to be personal or otherwise biased. This reflects in the language used. A number of sources identify differences and make recommendations for the formal style, one of them being the previously cited Swales and Feak [2004]; or another [<http://homepages.inf.ed.ac.uk/jbednar/writingtips.html>]. To name just the most striking features in grammar for academic writing: contractions (e.g. it's, there're) are forbidden, instead, full words are used (e.g. it is, there are). Another item is direct questions, which are hardly ever used (but this depends on the area – in humanities they can be found more often than in technical branches). Also expressions with „run on” meaning have a standard use: they should not be overused, and in no case can more than one be in a single sentence (such as *e.g. teachers, instructors, tutors etc. should be replaced by *teachers, instructors, tutors and others involved in education*).

A specific feature of academic writing is mid-position adverbs, which have to do with word order and impersonality in academic writing. The use of passive voice in academic writing enables the placement of an adverbial expression between parts of the verb. Thus, the sentence *the blood is withdrawn slowly* in popular writing will change to *the blood is slowly withdrawn* in academic writing. However, it is worth noting that in the humanities, passive voice is considered „inferior” to active voice and should therefore be avoided if possible [Chicago Manual of Style, p. 235].

Last but not least, realizing his/her position in relation to the audience (being on the same or lower level), the author does not address the audience as you, as is common in e.g. instructions or directions. Instead, the author is impersonal, utilizing passive voice or other forms of generalization.

The feature giving the text readability is **text flow** and **cohesion**. This means how smoothly the author moves from one statement to another and how he/she establishes a clear connection between ideas. The same basic ideas can be presented isolated (wrong!) or joined together with linking words (correct). These linking expressions, also known as discourse markers, help readers follow the text, which is then more pleasant to read. Again, means for better text flow can be found in different sources, such as Swales and Feak [2004].

The final step in academic writing is its **presentation**, meaning how tidy and attractive the text appears. This includes the overall format (margins, line spacing, the amount of „blank space” on the page in general) and paragraphing (one idea = one paragraph; a paragraph over one page in length or too many short paragraphs are both incorrect; generally, a paragraph should be at least three sentences in length).

An example of incorrect presentation can be seen in Fig. 1.

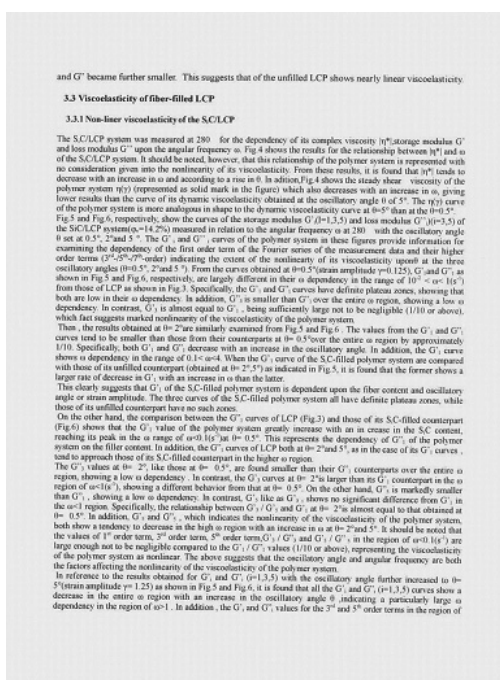


Fig. 1. Overall layout of a page – repulsive

It is required that authors in an academic environment use language (English in this case) without mistakes. For writing this means no mistakes in spelling (spell checker in word processing software is necessary) and grammar. Thus in proofreading, which is the final step in the process, the author must, above all, look for subject – verb agreements, correct prepositions and articles. As one person can hardly see his/her own mistakes, it is recommended to ask at least one colleague to read the text carefully and highlight the parts with mistakes or potential ambiguities.

Highly appreciated and valued (at some universities even required) is the ability of PhD students to write research papers (RP), which are „written and published report[s] describing original research results.” [Day, 1983]. Peat *et al.* [2002, p. 2] give several reasons why research results should be published. Among them:

- The researcher has some results that are worth reporting,
- He/She wants to contribute to progress in a scientific area,
- They want their work to reach a broad audience,
- They suppose to improve the chance of promotion.

All of these are relevant in a way. However, publishing is not easy. Indeed, the process is quite complicated, includes a number of steps and requires specific skills from the author.

First, the researcher must find a suitable topic, i.e. a question to be answered, a problem to be analysed using the latest knowledge. This is closely connected with reading relevant literature, keeping up-to-date. Of course, a RP is based on the author's own research. At the same time he/she must decide where to publish the paper, because each journal concentrates on a specific area and has requirements (structure, formal features) that must be followed. When the topic has been decided upon, the author collects information – theory and previous research in corresponding journals, relevant books and other resources. Here, attention must be paid to the reliability of sources. Especially Internet sources are to be double checked, as this is a resource where untrustworthy and even totally false information can appear.

Having collected information from reliable sources, the author then organizes it in accordance with the potential publisher's requirements [Swales, 1998, p. 93]. In this process it is necessary to keep track of sources to be able to identify later whose the „borrowed” ideas are. It is also important to set the framework of the document – page size, line spacing, outline, headings – and get the research results in the required form (tables, graphs). When the **ideas** are in logical order, the author creates a rough draft of the **full-text** version, i.e. he/she double checks the facts to ensure their validity and joins the ideas to create continuous text. If there are more co-authors, they should comment on the paper at this point.

Then, again, it is necessary to check the publisher's detailed requirements and to adapt the text accordingly. At this stage it is recommended to ask a peer to read the complete text so as to be sure that all ideas are clear and understandable, to „see the text with different eyes”. Finally, the complete version is to be proofread to eliminate miscellaneous mistakes before submission to the publishing house. Nowadays, the standard submission is via the web. Likewise, the reviewer's opinion and the author's response to it will most often be delivered electronically.

As mentioned before, during the entire process of writing it is necessary to clearly distinguish whose ideas or research results are being utilized. This has to do with plagiarism, an issue with potentially harsh consequences, often discussed at present. Plagiarism, i.e. using the ideas of someone else without acknowledging the source of the information [Davis, 1997], is considered a violation of academic integrity and in western cultures is strictly forbidden. Thus, any quote, paraphrase or summary of another person's idea(s), or any pieces of information found in a source that are not common knowledge, must be acknowledged with reference to the original source.

A research paper usually has the following parts: title, authors and their affiliations, abstract, keywords, introduction, methods, results, discussion (conclusion),

acknowledgment(s) and references. Even if the exact names of the parts may differ, in most areas this model of organizing ideas has been well established through years of scientific communication. Sections in the main body of the RP can be divided into several subsections, and the organization and content depends on the type of RP: empirical, methodological, theoretical, case study, etc. [Derntl, 2003].

The „shape” is reminiscent of an hourglass, as noted by Swales [1998]; see Fig. 2.

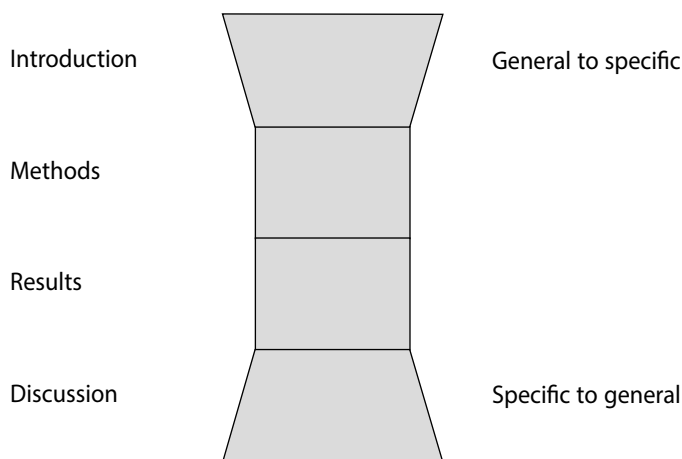


Fig. 2. Hourglass model of the proper construction of a RP the main body

In the process of RP construction, it is advisable to start with the easiest section, which in the „hard sciences” is generally **Methods** (and Materials). Here the author presents very specific information, the details of which he/she perfectly knows as they carried out the research „hands on”.

The basic purpose of the Methods section is to enable someone else to repeat the same research or judge whether the results are correct. Mainly the former purpose is very important in deciding what details should be included in the text. Simply – if the conditions could have influenced the results, they must be specified. If, on the other hand, a standard method was used, it is enough just to write the number/name of the standard, or if the same method has been described elsewhere, a reference to the source is sufficient.

In general, the Methods section may contain some of these:

- Overview of the research design (recommended),
- Restrictions/limiting conditions (give the scope of the research),
- Sampling, e.g. how respondents were chosen (random or deliberate),
- Location of the research (if relevant),
- Tools and instruments used to establish the facts/opinions from respondents, e.g. questionnaires, interviews, observations, recording, focused group discussions, tests,
- Procedure – systematic steps,
- Materials with necessary specifications,
- Variables (independent, dependent),
- Data collection (primary and secondary data sources),
- Data processing and analysis, e.g. statistical treatment, comparison.

More details and analyses were published e.g. by Kallet [2004].

The second easiest-to-write part of the RP is the **Results** section, sometimes formulated as Results and Discussion. It is still highly specific but slightly more generalized than the Methods section. The purpose of this section is to

- Present the results of research (relevant to the paper's main thesis),
- Interpret them,
- Discuss the significance of the results,
- Call attention to something not directly apparent from the table, chart or graph,
- Analyze data to support the thesis (= the main idea) of the RP.

When the author is sure about the process and results, he/she can get back to the **Introduction** section, which is more difficult to write and requires more analytical thinking and work with literature. The hourglass model dictates that the approach moves from general to specific. Swales [1998, p. 141] revealed a very logical flow of ideas in this part of the RP, the so-called CARS (Creating a Research Space) model, where he distinguishes three moves, with further division inside. Some of the sub-moves are obligatory, some optional:

- **Move 1 – Establishing a research territory.** This *may* include claiming centrality, i.e. showing that the general research area is important, interesting, controversial or problematic, i.e. worthy of attention, and *must* contain the review of previous research in the area. Actually, a literature review is what distinguishes scientific writing from popular texts. The ideas in a literature review can be organized in various ways: from established major theories to theories associated with individual authors, or in chronological order, or from more distant to closer topics.
- **Move 2 – Establishing a niche,** i.e. free space for the research. This can be done by indicating a gap in the previous research or raising a question about it, or by the need to extend previous knowledge in some way. This step is obligatory.
- **Move 3 – Occupying the niche** is usually done by outlining the purpose(s) or stating the nature of the present research (obligatory). It can also list research questions or a hypothesis. In some cases principal findings may be announced, the value of the present research can be stated, or the structure of the RP may be indicated. The last is performed in novel disciplines in which the RP structure is not yet well established.

Probably the most difficult part of a RP to write is the **Discussion** section. Again, some varieties can be seen across disciplines and even journals: if the previous section is called Results and Discussion, the last part is usually called Conclusion.

The Discussion/Conclusion section is somehow the counterpart of the Introduction. In terms of the hourglass model, these are mirror images – while at the beginning the ideas go from general to specific, at the end the process is exactly opposite. So, this section is not just a summary; it is „more theoretical, more abstract, more general, more integrated with the field, more connected with the real world, more concerned with implications and applications” [Swales, 2004, p. 196] Like in the Introduction, also here Swales identified three moves, which, however, are not as rigid as in Introduction.

- **Move 1 – Consolidation of the research space** recaps how the presented research has influenced the state of the art in the field, as indicated above.
- **Move 2 – Limitations of the study.** It is quite common to clearly state that the author is aware of the fact that the research is restricted, not complex enough to cover all aspects of the problem.
- **Move 3 – Possible further research** ideas can also be given, depending on the discipline. However, in today's competitive world it would be unwise to offer a good

research topic to someone else, so this is usually done only if the author has done most of the research on the topic and is ready to publish the results soon, thereby attracting attention to the future publication.

When all parts of the RP main body have been written (The content of the paper is clear), the **Abstract** is then created. Generally, there are two main approaches to RP abstracts: results-driven and „RP summary” [Swales, 2004, p. 210]. The former is based on the main findings, while the latter, as the name indicates, provides synopses of each of the paper’s sections (background, purpose, methods, results, discussion).

It is important to keep in mind the purpose of an article’s abstract, as it is a powerful tool for the reader as well as the author. The abstract has been characterized as a link between the document and the reader that allows the reader to determine whether the document will be of value [Trawinski, 1989, pp. 693-702]. One thing is important for the author – the abstract is generally the only part of an article accessible in databases (free of charge), thus a good abstract increases the chance of the author to be read and cited.

To create a complete version of a RP, some final additions must be made: Title, Keywords, Acknowledgement(s), References and of course – name(s) and affiliation(s) of the author(s). The **title** is very important as it determines the attractiveness of the RP for readers: it must not only reveal the topic of the article but also the scope of research. To avoid any misunderstanding, the title generally should be accurate and unambiguous and without abbreviations [Peat *et al*, 2002]. The length of title can differ substantially across disciplines, so it is necessary to follow the customs in the relevant journal.

Keywords characterize the content of the paper, the specificity of the research. They are very important in searching databases. As a rule, keywords are basic forms of specific words, usually nouns or noun phrases; prepositions (except in standard phrases) are avoided, the same as acronyms (some may have various meanings in different fields). Sometimes the number of keywords is limited, so the author must choose carefully.

An indispensable part of a RP is **References**. There are some standards in the referencing system which are used in particular areas, or required by different publishers. Each standard prescribes precisely what information on the source must be given and in what form. The most commonly used systems are the American Psychological Association (APA) Style, Chicago Style, or Modern Language Association (MLA) Style.

As stated at the beginning of this article, each academic discipline has a slightly specific way of writing RPs. For instance, the field of social sciences is well covered on <http://libguides.usc.edu/writingguide>.

Understanding the approach to academic writing and the creation of a publishable research paper belongs among the basic knowledge and skills of a novice researcher. Moreover, publication in English opens his/her results to an incomparable number of readers, which means a greater impact in practice. Thus, it is vital for a PhD student to master all steps, from selection of the topic, through the organization of ideas, to proofreading a RP before sending it out for publication.

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