

INTRODUCTION

The preparation of a research paper -- be it for a class term paper, a professional journal article, a technical report at a job, or a graduate thesis -- may generally be divided into five tasks:

- (1) identifying the problem or question to be dealt with;
- (2) collecting data (measured observations and/or bibliographic references) about the problem or question;
- (3) analyzing the data, either by statistical examination of the observations, or by reading, thinking about and organizing the literature;
- (4) describing in an organized and clearly understandable fashion what you did and what you found out;
- (5) putting the results of the research into the required finished format.

Often the constraints of the format are rather rigid, requiring a great deal of attention to detail. The plus side of this is that you know exactly what is expected; there is little room for subjective evaluation, and you either get it right or you get it wrong.

This write-up describes the rules of the research paper format for this course. A number of the "rules" are really warnings of common errors that students make in preparing papers; a careful reading of these instructions will hopefully keep you from making the same errors. Failure to follow one or more of the instructions in this description will result in a substantial lowering of your grade on the paper.

ORGANIZATION

The text of the paper may be organized / structured in a variety of ways. However, the critical organizational elements are that: (a) there **be** an organization, and (b) the organization **be apparent** to the reader. In most cases, the easiest and clearest way to insure structure is to divide the paper into sections, each having a descriptive title. In general, a paper may be grouped into four main sections, as described in the following paragraphs. More sections are possible, depending on the paper length and topic. In each case a figure is presented for how much space each section should take; note that these are just rough estimates and not firm space rules -- adjust them as necessary.

First, the topic should be introduced within the context of some larger problem. For instance, the question of the possible exploration for oil off the Oregon coast might be prefaced with a brief discussion of the worldwide demand for petroleum products and the U.S. need to be less dependent on outside sources of petroleum. This should take about one-fifth or less of the paper text, though not normally less than about one paragraph.

Second, the specific topic of the paper needs to be identified and described. Here you need to define exactly what it is that you will be discussing in the paper. For example, if you are writing about oil exploration off the Oregon coast, what aspect are you going to deal with? Are you concerned with the environmental implications, or the possible effects on the Oregon economy, or with the details of the actual process of how exploration is undertaken? This should take at least a paragraph and maybe as much as a couple pages, depending on the length of the paper. Normally it will be no more than about one-fifth of the total paper text.

Third, the main body of the paper -- including a statement / description of the

methodology and the data collection and analysis process -- needs to be presented. In longer research papers or theses the methodology description and the data collection / analysis are generally presented as different chapters, but in most term papers and short-term projects they are combined in a single section. This section should be carefully organized in a logical fashion, generally paying attention to the following:

- Select and deal with only 2-4 major points; don't attempt to cover too much.
- Avoid simply listing points; instead you should develop and discuss each point at some depth.
- Organize the points so that the reader knows where you are and where you are going at all times; do not jump around in a disjointed manner.
- Present just the facts and support them with references to data, either in the form of collected measurements or citations to literature.
- Do not interject personal comments or conclusions at this point; this is appropriately done in the conclusion / comments section.

The intent of this section is to present the material you have gleaned from your reading and research into the topic. This will commonly take about two-fifths to three-fifths of the text length, depending on the nature of the paper.

Fourth, you need to summarize and/or comment on the points of the paper. Briefly draw together the ideas in the previous section and include any personal observations and comments. Come to some kind of **conclusion** to indicate that you have thought about the material. Students often do not appreciate the importance of this section and tend to just hurriedly dash something off. Remember, this is where you get to connect together everything else you have written and to make clear any insights that you have gained from the research. This section therefore needs to be clearly written and to say something of relevance. This may take from about one-fifth to two-fifths of the paper.

Each of the main parts of the paper should have a section heading, such as *Introduction*, *Early History*, *The Current State of Research*, *Conclusion*, etc. Note, for example, the section headings used in this handout and how they serve both to organize the information and to alert the reader about changes in subject matter. When listing a number of points or major ideas, set them apart with bullets, numbers, etc.

WRITING STYLE

The paper title should be relatively brief, precise and descriptive of what the paper is about. Remember, the title is the *first thing* that the reader encounters when picking up your paper and it will impact both the first impression of the paper ("This sounds like an interesting paper,") and the final impression ("Wow, this paper does just what the title said it would do.")

The paper should be written in a professional manner. **Clarity, logical organization, and conciseness** are of primary importance. Assume that what you are writing will be read by another student who knows nothing about the topic, and include enough detail so that they will understand but not so much that they would be overwhelmed. Avoid the use of either slang or an excessive amount of jargon. Attempt to identify and properly employ only the commonly-used professional terms relevant to a subject. If you use a specialized term or one that is likely to be unfamiliar to another student, be sure to explain it. Specialized terms are frequently shorthand for complex ideas, so be sure that the idea is clear or the term will be meaningless and/or confusing. Your goal is to communicate effectively, not to impress your reader with esoteric terminology, and the judicious use of terms can be very effective in

helping to communicating ideas.

A major problem with many student papers is poor spelling or the misuse of words. When you are writing you should have a dictionary nearby and consult it often. The instructor will feel free to use a dictionary when reading your paper, so be assured that it is not unfair for you to use one when writing it. Many people also find a thesaurus to be an invaluable aid. Common errors include the misuse of: *affect vs effect, principle vs principal, i.e. vs e.g.*

Statements such as "I chose to do my paper on . . .", should be avoided. The topic of your paper should be explicit from the title, so do not bother restating the obvious. It is advisable to limit the use of the word "I" in the paper. In the past, scientific writing did not allow for the use of "I" at all, requiring that papers be written entirely in the third person in order to remain "objective." In recent years this proscription has been lifted, but it is still a good idea to maintain a certain amount of formality and detachment from the material; overuse of the first-person "I" can serve to destroy the semblance of objectivity.

Keep the reader apprised of where you are and where you are going. Verbally you can do this with phrases such as "For Example, . . .", or "To summarize the argument, . . .", or "Therefore, it may be concluded that" Keeping the reader apprised of where you are is especially important when listing a number of points, and can be achieved by numbering them. For example, "The first point is . . .", "The second point is . . .", "The third and final point is" Numbering in this way will generally work much better than simply rambling on with "One point is . . . Another point is . . . A further point is" Typographic *bullets* can be used in the same fashion to create lists in the text.

QUOTATIONS AND PARAPHRASING

You should avoid using many (or **any**) quotations in the paper. The paper should be your words, not the stringing together of someone else's words. However, if you do need to quote be sure to quote *accurately*, word-for-word. If you need to insert words in the quote to make it fit grammatically, use "brackets" ({ }). Likewise, if you need to delete some portion of the quotation use "ellipsis points," three dots (. . .), to indicate the location of the deleted material.

You may occasionally wish to paraphrase someone else's words. This is perfectly acceptable as long as you do not merely change a word in a sentence and call that a paraphrase. It is acceptable to use short phrases in which you have changed a word or two and not use quotes but you must reference the idea by the use of a proper citation. It is important to avoid doing this a great deal -- remember that the paper should be **your words**, not simply a string of paraphrases of other people's words. Intellectually, excessive paraphrasing is only marginally "better" than plagiarizing.

In the case of either quoting or paraphrasing, the key things to remember are that (1) you should not in any way modify the "intent" of the author's original words and (2) you should provide a proper citation or reference to the source.

CITATIONS/REFERENCES TO SOURCES

The paper should include citations to the sources of information in the paper. This should be done not just when quoting another person, but whenever you make use of ideas or facts that are taken directly from another person's work. Graphics -- whether they be simply xeroxed or redrawn with some changes -- should be cited just the same as you would

cite written words.

Rather than collecting these citations as footnotes, which is a nuisance to do, use the APA (American Psychological Association) form of scientific notation that is widely employed in the professional literature. The citations should be included in parentheses in the text and should include the **author(s)** (last name only), **date** of the publication, and **page** reference. The following examples indicate some of the ways that citations might be done:

Four classes of vegetation have been identified (Jones 1982 127).

According to Jones (1982 127), there are four classes of vegetation.

In 1982 Jones (127-129) described four classes of vegetation.

In a case where you are citing an entire work or a large section of a work, the page reference may be omitted:

The classic study of vegetation patterns is the two-volume work by Jones (1982).

In the case of a single work with more than one author, the rules generally are: if there are two or three authors, then list them all; if there are more than three authors, then list only the first and indicate the remaining ones by the phrase "et al", an abbreviation of the Latin "et alii", meaning "and others." For example:

This concept is widely used in geography (Colt, Smith and Wesson 1991 71).

The theory may be reduced to four principal steps (Ogden et al 1990 342).

The following example illustrates how punctuation is used when referencing multiple sources:

Several authors have discussed vegetation (Jones 1982; Smith et al 1974; Doe and Buck 1973).

Note that the use of "ibid", "op cit" and other such terms is not appropriate in this system of citation.

GRAPHICS

A common weakness of student term papers is a reliance solely on written forms of communication and an overlooking of the possibilities offered by graphic communication. Remember, the goal of a term paper is to *communicate ideas*, and very often a graphic may be a better means of communicating than a lot of words. Thus, the use of graphics in the form of simple maps, flowcharts, graphs, tables or lists should be kept in mind. If a graphic might help to communicate or would be useful in communicating, then do not hesitate to use it. On the other hand, the use of a graphic simply for the sake of including a graphic should be avoided.

The preparation of a graphic for a term paper need not involve a great deal of artistic

talent or an excessive amount of work. If you wish, you may draw your own graphics, and indeed, if you require a graphic that does not exist, you can draw it yourself. However, if the graphic does exist and will make a clear and legible copy on a xerox machine or scanner, it is perfectly acceptable and generally easier to use an existing graphic. Likewise, the use of graphic material from the Internet may be a good choice. In either case, remember that you are using someone else's work and it is necessary to cite the source, just as you would for any other information in the paper.

If you make use of an existing graphic, be sure not to include any extraneous text or extra material from the original source -- focus in on the material that you wish to communicate. A useful trick is to enlarge the graphic somewhat on the copy machine, a procedure that often helps improve the legibility of printed-original graphics when they are xeroxed. You should feel free to "white out" unwanted portions of the graphic or to add information to it, so long as you indicate in the citation what you have done, e.g., by saying "modified from Smith (1983, 235)." Digitally you might scan a graphic, edit it in software such as Photoshop, and print a revised version.

However you choose to produce graphics in your paper, you should keep the following in mind:

1. Be sure to refer to the graphic in the text -- don't just include the graphic and assume your reader will make the connection between it and what you are saying. It is usually best to make a direct comment referring to the graphic -- do not simply refer to it in a parenthetical fashion. Some comment or discussion of the graphic is usually appropriate, even if just a one or two sentence summary of what the graphic shows.

Comments are especially important if you wish the reader to obtain a particular piece of information from the graphic that may not be readily apparent. For example, rather than saying "(See have Figure 2)" with no other comment, you might say, "As illustrated in Figure 2 . . ." or "Figure 2 is an example of . . ."

2. Each graphic should be on a separate page and should fit within the same margins as the typed text. Do not attempt to fit the graphic on the same page as the text. This is very time consuming and not worth the effort.
3. The graphics pages should be interspersed with the text pages so that each graphic appears as close as possible to the portion of text that refers to it, but **not before** the reference. Graphics should **not be collected together** at the end of the paper.
4. Below each graphic should be a caption which includes: (a) the number of the graphic; (b) a short title or descriptive phrase indicating the relevance of the graphic or the main point that you wish the reader to get from it; (c) a citation of the source of the graphic. For example,

Figure 6. Population change in the U.S., 1950-1980 (Peoples 1985 7). Note the dramatic increase in percentage of the population in the Sunbelt.

5. Keep the graphic simple--overly complex graphics do not communicate very well.

BIBLIOGRAPHY

The length of your bibliography will vary with the topic but it will usually consist of more than a couple references. These may be journal articles, proceedings of professional meetings, portions of books, maps, research reports or Internet sources. Note two things:

- An encyclopedia **is not** an acceptable reference for a college level term paper.
- While Internet sources are acceptable and may provide valuable information, if a *minimum number of references* is specified for a term paper, Internet sources are **not counted** toward the minimum number. In order to count, sources must be from published, peer reviewed / edited literature; this means books, journal articles and technical reports.

You should not be looking just at books but should be exploring articles in professional journals as your primary source of information. In a class research paper you normally do not have time to read large portions of books. In addition, the time lag between the introduction of new ideas (which usually occurs in the journal literature) and their inclusion in a book may be several years. Journals provide current thinking in a shorter and more quickly read format. The variety of sources will obviously differ with the subject matter but should consist of at least a couple of different types of sources and will probably consist of a greater number of journal articles or proceedings papers than books.

The bibliography should appear at the end of the paper and should include all materials referenced in the paper. It should be organized in alphabetical order by the author's last name. Multiple entries by the same author are put in chronological order (oldest first); if two or more entries by an author are from the same year, use letters with the date (e.g., 1989a, 1989b, . . .).

Normally the bibliography is typed single spaced, with a blank line between each entry. Book titles and journal titles may be either all vertical caps or caps & lower case in italic font. Following are several examples; pay particular attention to *punctuation* in each of these examples, as this is the place where many people make errors.

For a journal article the following format should be employed:

Loser, Ima. 2001. Casinos of the West. *Geographical Statistics* 32:125-42.

For a reference to a book the following format should be employed:

Treez, Lotsa and Lacy Fernz. 1998. VEGETATION ANALYSIS. New York: Protoplasm Publishers.

If a piece of work by an author appears as part of a book edited by another person, the following format applies:

Long, Chuga. 1999. Railroads of Tolland County. In Mobile, Audie (ed.), *Transportation Geography*, pp. 134-67. Boston: MBTA Press.

When referencing information you have obtained verbally by interviewing someone, use the following format:

Cooke, Stephen. 2002. Personal communication with a long-time resident of the Willamette Valley.

For a reference to a public talk or a class lecture, use the following format:

Olson, Judy M. 2001. Comments by a past President of the AAG in a public lecture in PSU Geography Colloquium Series.

For a reference to an Internet site, include both the URL and the date you found the information:

<http://www.geog.pdx.edu>, 23 June 2003.

If you have any questions about the above examples or have a special situation not covered by the examples, check with the instructor. Proper technique in bibliographic referencing is extremely important.

ABSTRACT

If an abstract is required, it should be written *last*, so that it reflects what you *actually said* in the paper, not what you had originally *set out to say*. The abstract should deal with the main thrust of the paper and succinctly summarize the *major theme(s)*, *points made*, and *conclusions*. It should not focus on the details of the content.

The abstract should be included on a page by itself (unnumbered), between the cover page and the first page of text. Generally an Abstract is about 150-200 words long. At the end, include 3-6 keywords that characterize the subject matter of the paper.

LAYOUT AND TYPING

The final submitted paper should have as the first sheet a *cover page*. This should include the paper title, your name, the course name and the term (e.g., Fall 1985). The last sheet of the submitted paper should be a blank piece of paper, acting as a "back cover." In between these cover pages is the actual "paper", consisting of Abstract (if required), text, graphics, Bibliography, and (if needed) Appendix, in that sequence.

The pages of the submitted paper should be "bound" only by a staple in the upper left corner. Do not bother with colored plastic "report covers" or other types of binding -- they simply make it more difficult to handle the paper while reading it. It is much easier to mark up and make corrections on a paper if it has been bound by only a corner.

All pages but the cover page, Abstract and the blank back cover should be numbered. The first page following the cover page is numbered "1" and all subsequent pages are numbered, including graphics pages, the Bibliography and the Appendix. If there is a page length specified for the paper, the **only** pages that are counted toward that length are the text pages. Although they are numbered, pages that contain graphics, Bibliography and Appendix material **do not count** toward the page length.

The final paper should be typed/word-processed, double spaced on 8-1/2 X 11 inch unlined paper. The first line of each paragraph should be indented and there should be no extra blank lines between paragraphs. The reason for double-spacing is simply to allow the reader sufficient room to make editorial comments. For the same reason, there should be margins of at least 1 inch on all four sides. *All graphics -- maps, diagrams or tables -- should observe these same margins.* On the other hand, items in the Bibliography should be single-spaced, with a single blank line between items. Frequently each item in the bibliography uses a *hanging indent* format, where the first line starts at the left margin and subsequent lines for the same entry are indented.

One of the most common problems with student term papers involves the details of formatting in the typing, particularly in the Bibliography. For example, there should always be a blank space between a comma and the word following it, whether dealing with text, a citation or the bibliography (the one exception is the use of commas as separators in

numbers of four or more digits.) Likewise, a colon in *text* is always followed by a space, but not when used as a separator between volume number and page numbers in a *bibliographic citation*. Pay heed to these sorts of details -- inattention to details implies a sloppiness that can easily affect the overall grade on a paper.

You should keep a backup to the submitted paper -- including both text and graphics -- either as a photocopy/xerox or as a computer file. Instructors *do* occasionally lose papers and by keeping a backup you are buying some very inexpensive insurance for your work.

EDITING

When the paper is completed, do a final edit.

- Do a spell-check. With the ubiquity of spell-checkers on word processors there is no good reason for misspellings in a paper.
- Proofread for grammar and format in the text.
- Carefully look over your graphics for misspellings, incorrect numbers or dates, and omitted features. Proofread the captions as well.
- Check the format of the bibliography.
- Verify that all your citations in the text are actually listed in the bibliography.
- It is useful to have someone read over your paper, especially looking for awkward phrasings or unclear statements. As the author, you are generally too close to the work to do an effective evaluation: you know what you meant and what you *thought* you said; it often takes someone else to tell you what you *really* said.
- Ideally, it is best to finish your paper a week or so early, let it sit, and then look it over once more before handing it in.