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## How to Prepare a Research Paper

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## **HOW TO PREPARE A RESEARCH PAPER**

A lecture delivered by  
*Dean James Harold Fox*  
at the Naval War College  
23 August 1950

I understand that you frequently have to engage in research—usually the research that necessarily precedes administrative action; but sometimes research of a more formal nature. I assume that the results of your efforts are normally reported in writing, but on occasion I am told that they must be made orally. It is my purpose this morning to give you what help I can with such matters.

No doubt your immediate reaction is, “What does he know about naval research and our work here at the War College?” The answer is, “Very little.” Although a good deal of time has been taken to show me representative examples of reports and to discuss with me some of the criteria used in judging research papers, I must confess only a very superficial acquaintance with your problems.

Whatever I have to offer must come largely from thirteen years of experience in directing the research of graduate students, during which time I have tried to assist several hundred students with minor research problems and have tried to give guidance to about one hundred students who were working on theses and dissertations. Because of this, part of what I am going to say to you may not apply directly to your situations. I must depend upon you to select that which you find pertinent.

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Mr. Fox is Dean of the School of Education, George Washington University.

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### STEPS IN RESEARCH

Research is a complex activity involving a wide variety of steps and procedures. In my course at the University we devote a semester to the study of research methods. The content includes discussion of historical, experimental, case study, and genetic research methods, as well as several types of normative methods. The use of bibliographical and statistical tools are also studied. Obviously, the content of a semester course cannot be presented in 20 minutes.

In view of this, I shall simply list for you a few of the more obvious steps in conducting relatively uncomplicated historical and normative research.

*Clarify the problem.* Examine the statement of the problem. See that you interpret the meaning of each word in the same way as the person or group making the assignment. Be sure that you understand the scope and limitations of the problem. For instance, if the word "future" appears in the description of it, find out whether it means the next three months, one year, five years, or twenty-five years.

*Consider the setting of the problem.* A problem never occurs in a vacuum. It grows out of something; it is related to a host of other problems; and it leads to something. You should take time to study these relationships by (1) informally interviewing those acquainted with related background and contemporary problems, (2) forming small discussion groups and taking turns exploring the settings of each other's problems, or (3) gathering background information in the library, from newspapers, and unpublished reports.

*Analyze the problem into its sub-problems or phases.* Before attacking a problem reduce it to its simplest elements so that each may be attacked singly. Your ability to do this will depend in part

upon your success with the previous step. Again, small group discussion is likely to be an effective tool.

*Construct a tentative plan for your report.* The essential parts of a report will be outlined later in this address but it should be stated here that the report should be planned around the probable questions of the readers.

Of course, these will vary. If your report is to be read only by the staff and students of the War College, the plan of it will differ from one to be read by the Bureau of Naval Personnel or a civilian board.

Again, a small group of students, working together, can do much to increase the sensitivity of one another to reader interests. Role playing is a useful device in this connection. Let each member of the group play the role of a different type of reader.

*Explore the sources of data.* In this connection, careful consideration should be given to the reliability of data. Ordinarily, primary sources are more reliable than secondary or tertiary sources. A primary source may be simply defined as one that has not been subjected to the biased or incomplete interpretation of an intermediate person. The original writings of Admiral Mahan would constitute primary evidence concerning his views. A journalist's or historian's interpretation of his writings would be a secondary source. A review of the historian's interpretation would be a tertiary source, since the original evidence was subjected to the distortion of two successive interpreters.

The most of your sources are likely to be secondary or tertiary. You will need, therefore, to be concerned with the faithfulness with which the primary evidence is reported. In this connection, you will want to consider the scholarship of the writer, his skill in

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reporting, and the nature and extent of his bias. An eye-witness account by a good news reporter, operating under a liberal editorial policy, may be a very reliable source of data. On the other hand, a news analyst's summary, subject to both selective and directive bias on two levels, is usually not considered to be a very reliable source of information.

*Construct an exact list of sources of data.* This normally begins with the construction of a bibliography. Locate, with the help of the librarian, appropriate indexes to the desired references. Construct a tentative list of headings with which to gain entry to the indexes. Try out the headings on one volume of an index. Discard unfruitful headings and revise the list as indicated by the trial run.

Use a bibliographical card to list each reference. A printed card, such as the one by Alexander, is desirable if complete bibliographical data is desired. If less information is needed, the student may wish to construct and have duplicated, a simpler card.

Other sources of data such as unpublished reports, statistical compilations, and lectures should be similarly listed on cards.

*Revise the tentative plan of the report.* By this time, the student will have a much better understanding of the nature and scope of the data. It is time to revise the plan of the report in the light of this new knowledge.

*Prepare a catalogue based upon the tentative plan of the report.* The bibliographical cards should be used for this purpose and adequate cross references should be made.

If the research is normative and the data lends itself to tabulations, some kind of worksheet will be needed. For data easily coded a large sheet ruled both ways may be satisfactory.

For descriptive data, not easily coded, a card system is likely to be better.

*Finally, revise the plan of the report.* With the data well in hand, needed revisions in the plan of the report will become apparent.

## HOW TO WRITE A RESEARCH REPORT

A research report is a means of communicating research findings to a particular audience. It always involves communication difficulties, the magnitude of which depends upon the facility of the author in writing and the nature of the audience. For instance, when a naval officer is writing for an audience of naval officers, semantic difficulties are likely to be a minimum, since the audience is thoroughly familiar with the terminology of the writer. If, however, the audience is civilian, semantic difficulties may be much greater. Perhaps it is not too improbable to suggest that, in the future, naval officers are likely to have cause to write for civilian audiences more frequently.

*Make the report easy to read.* This is not the time to impose an intelligence test upon the reader; nor is it the place to prove that you have a sixty-four dollar vocabulary. The mechanical difficulties of reading should be reduced to a minimum so that the reader can devote his entire attention to what is being communicated to him.

*Use a vocabulary that is understood by the audience.* Each reader has a different vocabulary at his disposal, since his vocabulary reflects his previous experiences. The effective vocabulary available to a writer is that which is held in common by each member of the audience. Since the writer cannot precisely survey the vocabulary mastery of each member of his audience, his only

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recourse is to use a vocabulary burden considerably less than that which could be tolerated by any one individual in his audience.

*Make the composition easy to read.* The more syllables there are in a word, the harder it is to read and understand. Likewise, the more words that there are in a sentence, the more difficult it is. Short paragraphs are more readable than long ones. Placing the topic sentence first in the paragraph makes the material easier to scan.

Side-headings also increase readability, as do double spacing and short lines. Skillful use of tables, diagrams, and pictures can do much to improve written communication.

*Maintaining a high level of reader interest.* Simplification of the mechanics of reading tends to increase interest since it permits more concentration upon content. Good planning and a logical presentation also encourages interest. Reader interest is heightened by using more words about people and addressing more sentences to the audience.

## ORGANIZATION OF THE REPORT

*Title.* The title should embody in concise form the subject of the report. If this requires a lengthy statement it may be advisable to use a short title and a longer sub-title.

*Preface.* If you must philosophize before coming to grips with the subject, do so here. The reader will then be able to skip it. However, the preface may serve the valuable purpose of acquainting the reader with the writer's personal interest in the problem.

*Table of contents.* The main purpose of the table of contents is to acquaint the reader with the scope of the report and its

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major divisions. Although it helps the reader to locate the major divisions, it is not an index.

*Introduction.* Begin the introduction with a clear, concise statement of the problem. Do not try an ornamental, subtle, or philosophical approach. The reader needs to be anchored to the problem. Do so in a straightforward manner.

Follow the statement of the problem with definitions of terms, if needed, and a clear statement of its scope and limitations. Do not discuss the meanings of terms. Decide upon the meaning desired and state it.

Break the problem down into its sub-problems, keeping in mind the probable questions of the reader. If needed for clarity, illustrate each sub-problem with an example.

Having stated the problem, tell the reader in general terms what steps were taken to solve it. This need not be in sufficient detail to enable the reader to repeat the research but it should be enough to satisfy him that the research was sufficiently complete and skillful to warrant the investment of enough time to read it. What is included will depend upon the nature of the problem, but ordinarily the categories of data sources should be listed and the means of discovering, selecting, and utilizing them should be described.

It will be observed that the introduction answers two questions: "What is the problem?" and "How was it solved?"

*Review of the literature.* In the case of historical research, this will be the main body of the report. If it is a normative research, the chapter on the literature serves to bring the reader up to the frontier of knowledge, prior to the present research. The review



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normally ends with a concise description of the status of the situation and the bearing of the research upon it. In some cases, a separate chapter should be devoted to the status of the situation.

A simple chronological recital of historical developments is seldom more desirable. Usually, it is better to trace the development of each sub-problem separately, organizing the references around major changes, trends, or centers of interest. Ordinarily, it is not necessary to describe all the references of the period. Whenever possible, the writer should group similar references together, describe the most typical, and merely note important variations in the others. It is well, however, to mention these references in the footnotes, lest the reader disagree with the way that they have been categorized and may wish to check for himself.

*Detailed description of the research procedures.* Normative research, requiring the use of a variety of devices to gather data from diverse sources, should have its procedures described in some detail in the report. Unnecessary detail should be avoided but there should be sufficient detail to permit the reader to repeat this research if he questions the data or conclusions. Failure to do so may impair confidence in the research findings.

As a rule, this chapter may be omitted in a report of historical research, the description of procedures in the introduction being sufficient.

*Presentation of the findings.* It is well to begin the chapter on the findings of the research by orienting the reader concerning the plan of attack. Treatment of each sub-problem or phase of the study normally follows in the sequence planned earlier.

Before presenting the data concerning a phase of the problem the reader may need to be oriented with respect to its general significance and its relationship to the problem. The writer should

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be guided in this by the anticipated questions of the reader. These should have been considered early in the research.

Presentation of the data in the form most easily understood by the reader should follow immediately. Tables and figures are to be used only when they facilitate interpretation of the data. Ordinarily, data should be presented only once, although repetition for purposes of analysis is sometimes desirable.

To discuss data before it has been presented is an affront to the reader. It is false economy to misplace tabulations of data in order to save paper. A complete restatement of data following tabular presentation is superfluous, although the writer may properly call the reader's attention to particular points that may be missed, especially if they are to form bases for inferences and conclusions to be drawn later.

*Implications and conclusions.* The final chapter or section of the report generally deals with implications and conclusions drawn from study of the data. This is the most difficult part of research. Inadequate utilization of the data collected is a common failing of researchers. Group study of data generally results in better utilization.

As a rule, conclusions should be based only upon the data presented. If other bases are used, they should be identified and their relative influence indicated.

*Adaptation to short research assignments.* Obviously, the type of report described above is too extensive for use in reporting quick research that precedes administrative action. It may be unnecessary to report such research at all; or presentation of only the conclusions with the more crucial supporting data may be sufficient. It should be remembered that a report is only a means to an end and its form should be that which best serves that end.

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### ORAL PRESENTATION OF A REPORT

In most respects the presentation of an oral report is very similar to that of a written report. However, there are some major points of difference. These stem largely from the fact that the ear replaces the eye as the receptive sense organ, and the instrument of communication is the voice instead of writing.

The ear is less sensitive than the eye and has a longer reaction time. In most people, it is less effective in stimulating mental imagery, although there are some exceptions to this generalization. Although both sense organs respond to only limited wave lengths, the range of variability is normally greater for the eye than the ear.

On the other hand, the voice, since it operates under fewer restricting rules, is much more adaptable to communication needs than writing as practiced at present. Stultifying rules of grammar and spelling need to be modified to permit greater flexibility in writing. The use of different colors and types of print would also introduce a desirable flexibility.

The idea, then, is to avoid or circumvent, as far as possible, the limitations of the voice-ear medium and exploit to the fullest its advantages.

*Speak Slowly.* Much of the effectiveness of the late President Roosevelt's speech was due to a slow delivery with effective phrasing and significant pauses.

*Enunciate clearly.* Good enunciation is to the ear as a clear-cut image is to the eye. Blurred speech is like blurred print.

Poor enunciation is usually a matter of habit and it takes repeated effort to improve it. There are, among others, three

common causes: the habit of speaking too rapidly — trying to speak as rapidly as one can read; a lazy tongue — failure to adjust the mouth cavity to get needed resonance; and poor use of the lips — incomplete termination of sounds, resulting in blurring.

*Pronounce acceptably.* This is of no great importance communication-wise. Rarely is a word so poorly mispronounced as to be misunderstood (unless a strong accent is involved). However, acceptable pronunciation is important socially. Because of this, pronunciation ordinarily should conform to usage commonly accepted by the audience.

*Use intensity effectively.* If you cannot be heard in the back row, you are only speaking to a part of your audience. Opening the mouth sufficiently to get the full effect of resonance is important. Breathe deeply to get more pressure across the vocal chords, thus increasing the amplitude of their vibrations. Strengthen the vocal chords through exercise.

*Vary tone and loudness.* The ear is more easily bored than the eye. If interest is to be maintained, variations in pitch and intensity are essential. The monotone who maintains a constant level of intensity is apt to lull his audience to sleep.

*Be as natural as the situation permits.* As a rule, the natural speaking style of the speaker is more effective than any affectation of style. It should be remembered, however, that naturalness is only a means to an end, and the speaker should not hesitate to use any socially-acceptable device that will improve communication.

An oral report is likely to be more effective if the speaker uses only a few notes as a guide. This permits greater flexibility and increases sensitivity to audience reactions.

There will be times, however, when the nature of the content or the demands of the occasion require close adherence to written

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copy. The handicaps thus imposed may be offset in part by slow delivery, careful phrasing, good inflection, and off-the-cuff elaborations of important points.

*Use illustrations.* The tendency of the ear to handicap mental imagery may be overcome in part by the liberal use of illustrations. However, care should be taken to see that the center of interest does not shift from the report to the illustration. This requires presentation of the illustration in terms of only the dramatic outline necessary to strengthen the impact of the point under consideration.

*Use appropriate visualization.* Some of the limitations of oral presentation may be overcome by the use of visual aids, facial expression, and gestures. Again, these should not be permitted to usurp the center of interest.

*Keep within the bounds of time available.* To permit slow delivery and the ample use of illustrations, content needs to be condensed. This requires skillful briefing of the material without omitting essential points.

*Many other aspects of oral presentation.* It is obvious that only a few aspects of oral presentation have been mentioned. Detailed development of the subject must be left to other means; but it is hoped that these few points will be of some assistance to those who make oral reports.