

A Framework for assignments and reports: IMRaD

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Abstract

This article describes the IMRaD model for layout of assignments and reports. The model has four logical sections, Introduction, Methods, Results and Discussion (hence the acronym IMRaD). Actual chapters may reflect these sections, but sometimes it is practical to join sections or break up a single one.

1 Introduction

This report is intended to present a well-known general model for writing solutions to assignments and other topics with a simple structure.

The model is taken from Chapter 12 in the book *Technical Report Writing Today* by Riordan and Pauley. While they call the model IMRD, the acronym IMRaD is often used since it can be pronounced as a normal word. Chapters 1-11 of the book deal with style, the relationship of the writer to the reader and other general subjects that add to and deepen understanding of the concepts of chapter 12. Nevertheless, the chapter 12 may be read alone. Later chapters deal with other types of writing that are outside the scope of this article.

The focus here is on reports, with additional descriptions of particularities for assignment solutions.

2 Method

An IMRaD report contains four main sections which are:

1. Introduction
2. Methods
3. Results
4. Discussion and conclusions

The *Introduction* describes the background of the work and puts it in context. If the report only deals with a part of a larger project, its relationship to the overall work should be described. The introduction should describe the status

before the study and mention former studies when it helps setting focus for the subject of the report. Former studies should not be described unless the report is an overview of either the history or the current status. The introduction should end in a research question to be answered by the report.

The *Methods* section describes the procedure used to answer the research question. The description must be thorough enough for the reader to judge its correctness and how complete it is. A common requirement is that the description is detailed enough for the reader to be able to repeat the experiment. Then details may belong in an appendix rather than in the report itself. If the choice of method needs to be justified, it should be done here. If another method was tried but revealed itself unsatisfactory, it may be mentioned, but normally the history of the work is not detailed. Results do not belong here but in the next section.

The *Results* section just shows the results of the method described in the Methods section. Summary statistics, figures and tables should be used when convenient for the sections purpose. Details such as listing of individual measurements should most often be omitted or put in an appendix. While this section should contain the explanations necessary for it to be understandable, interpretations and deductions are to be kept for the Discussions section.

The *Discussion* answers the research question and indicates how successful the work was. Conclusions drawn from the results are presented and the significance of the work (for the author or others) explained as needed. The discussion should also include further questions that got raised during the work, eventual continuation and possible improvements to the method.

2.1 Division into chapters

The IMRaD model can often be reflected directly by the separate chapters of the report. Sometimes, some sections are too small to merit a separate chapter, for example a detailed assignment may not need a separate introduction (for example hand in a solution of exercise 60 in chapter 3). Also, some sections might need to be further broken down. It might be better to put them into separate chapters rather than use sub-chapters uniquely to stick to the IMRaD model.

3 Other sections

The four main sections may need to be completed by four more sections: abstract, thanks, references and appendices.

An *Abstract* or a *Summary* is needed when the report is long, in particular if reading it is not mandatory for the receivers. The abstract should be short, of the order of magnitude 100 words. The abstract may not say anything not stated in the report itself, it is not a conclusions chapter.

Thanks may be a separate chapter. It should mention those that are close to being authors without being responsible for the report's contents, for ex-

ample those delivering the data, treating it, people putting forward important ideas in conversations with the author as well as referees and maybe readers of manuscripts.

References must be listed if more are used than mentioned in the title and the textbooks of the course where the report is submitted. All sources referred to in the text should be listed and no others. If any standard is explicitly fixed in the course for the form of references in text and the layout of the list of references, it should be adhered to. Otherwise a general standard like API (American Psychological Institute) should be followed.

Appendices may be used for material logically belonging to the report, but too bulky to be part of the main text. While an exact description of the conduct of an experiment (for example sampling method) and detailed results are often necessary for the experiment to be replicated, that material might make up a disproportionate part of the report and merit an appendix or two. In that case, these aspects should be summarized in the main text, eventually through tables, summary statistics and figures.