Technical Report Structure

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***Abstract*—When writing a technical report, you should begin with your conclusions first. While such an approach may seem backward, it is actually easier for both author and reader. This paper describes how to write using "Inverted Pyramid" structure.**

I. The Inverted Pyramid

Many academic papers now follow an "inverted pyramid" structure. This kind of writing emphasizes the most important facts or conclusions first, then follows with subordinate details, including explanations of the methodology, evidence, or findings. This may directly contradict what your high school English teacher told you about writing. He/she probably advised leading into a thesis statement, capturing your reader's attention with an anecdote, beginning chronologically, etc.

However, academic disciplines are increasingly abandoning that kind of writing. Instead, papers are often structured to facilitate faster reading, which means that the author must begin with his/her most important point and include as many of the 5Ws as possible in that first statement (Who, What, When, Where, Why). This usually involves re-writing the introduction after the rest of the paper is finished, so that the introduction more accurately reflects your conclusions.

Fig. 1 demonstrates the principle of "inverted pyramid" structure. The example comes from an actual article that appeared in *IEEE Transactions on Education*. While the authors did not use inverted pyramid structure in writing their report, their article lent itself well to such a revision [1].

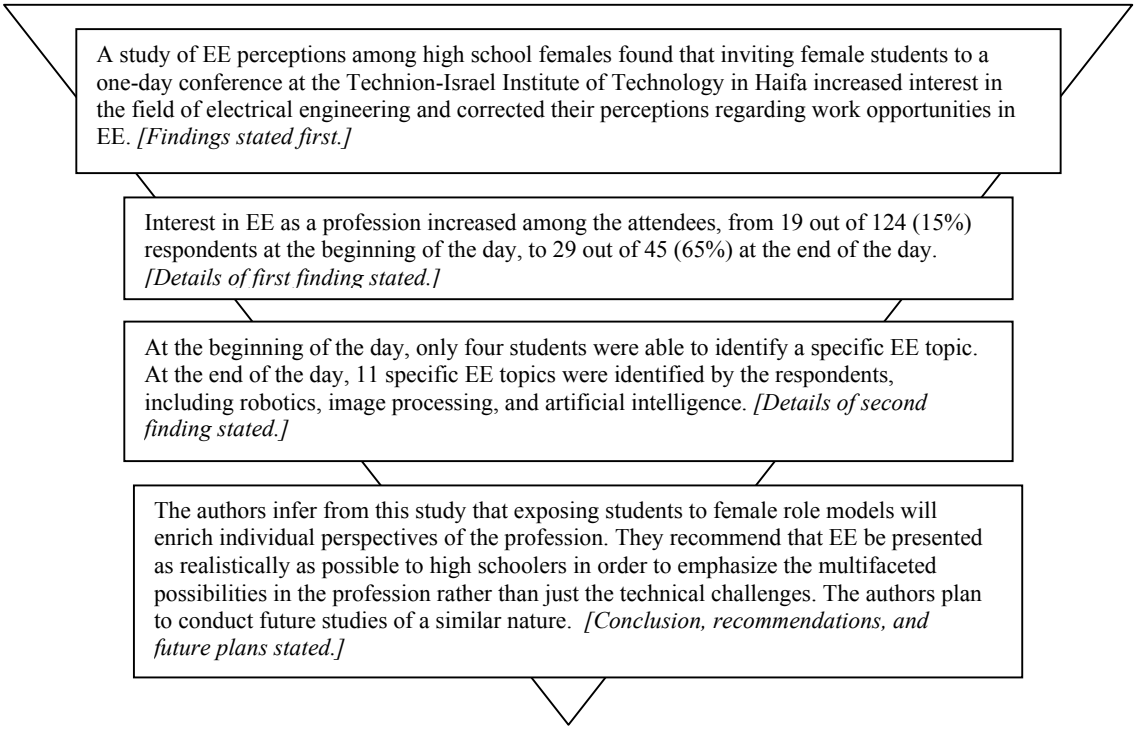

Fig. 1. Simplified inverted pyramid structure for technical papers.

II. Inverted Pyramid Structure within Sections

The inverted pyramid technique should also be used *within* each section of your paper. The first sentence in each section should state the main point of that section. Then you may give the background or explain the methodology, chronology, etc. Every section should end with a conclusion that summarizes your main points and leads logically to the next section. Fig. 2 demonstrates how inverted pyramid structure can be used even in a Methods section. Note that once the overall methodology has been described, the later paragraphs follow a more traditional chronology to describe specifics.

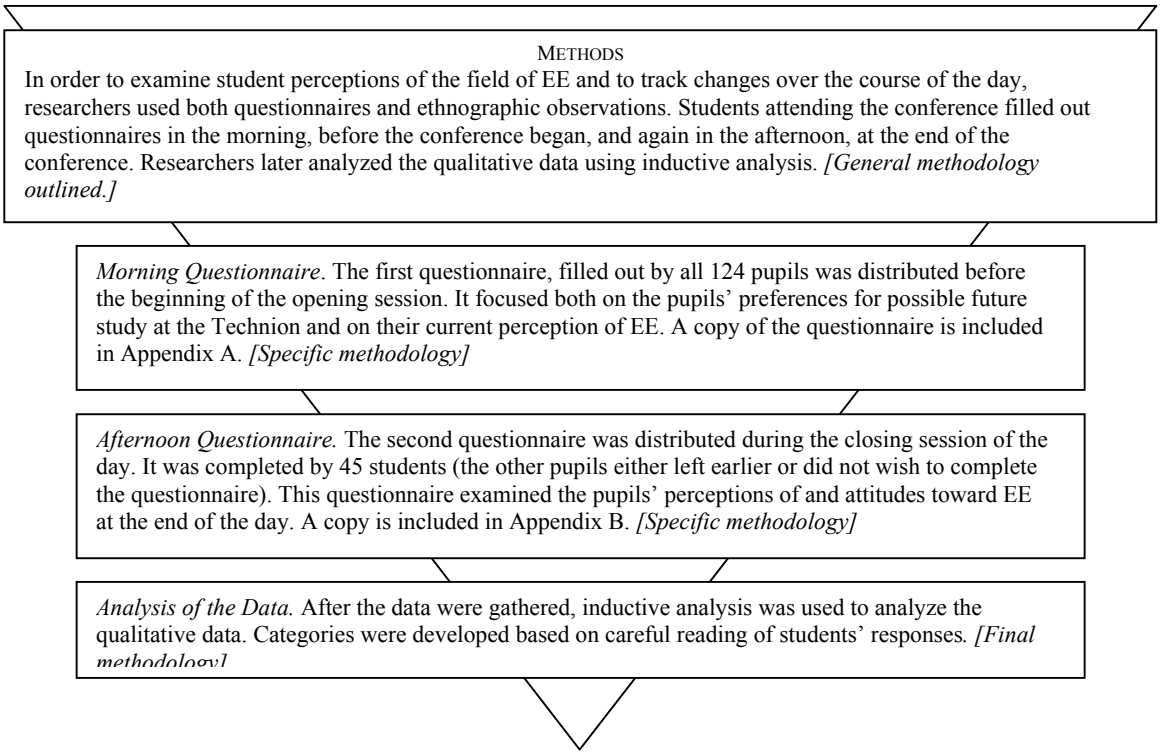

Fig. 2. Methods section using inverted pyramid structure.

III. Inverted Pyramid Structure within Paragraphs

Even at the paragraph level, the inverted pyramid structure works well. Most students are already familiar with the concept of a "topic sentence" that begins each paragraph and defines its subject matter.

The topic sentence is simply the first step in an inverted pyramid structure. Begin with a broad, general statement that will be the focus of that paragraph, then discuss that topic in more detail in the rest of the paragraph. Each paragraph should discuss a different topic.

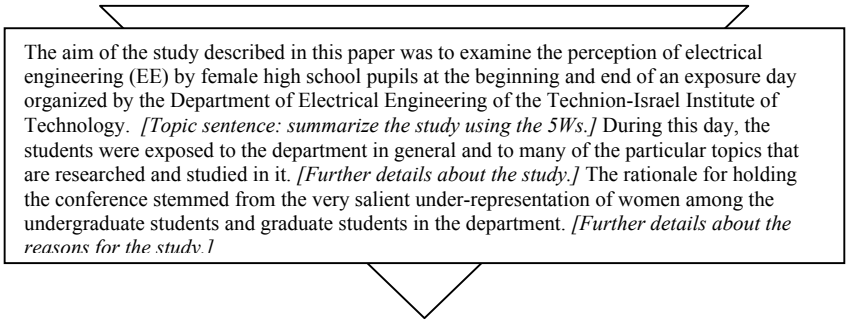

Fig. 3. Inverted pyramid structure at the paragraph level.

IV. Limitations of IP Structure

Many scientists still do not use IP structure in their writing, and this makes their work very difficult to read. IP not only helps a reader make sense of the paper, it also helps an author organize his/her thoughts better. Yet IP is not appropriate for every situation. Methods sections, for example, sometimes need to be organized strictly in a step-by-step fashion. Abstracts, on the other hand, should *always* be organized with IP structure so that a reader knows the conclusions right from the start. With a little practice, you will soon feel more comfortable with IP structure. You may even find that papers almost write themselves once you've decided what the main point of each section is.

References

[1] O. Hazzan, D. Levy, A. Tal. "Electricity in the Palms of Her Hands—The Perception of Electrical Engineering by Outstanding Female High School Pupils." *IEEE Trans. Educ.,* vol. 48, no. 3, pp. 402-412, Aug. 2005.