

## Spectra Undergraduate Research Journal

### Peer Review and Critical Thinking

#### 1) **Purpose:**

This document aims to help you understand how your manuscript will be evaluated by external reviewers so that you are able to critically evaluate your own work prior to submission. When you write up your research finds, it is wise to adopt an active and critical stance throughout the writing process to get into the habit of practicing critical thinking.

#### 2) **Format of a journal article:**

Journal articles have the following general format. The same format is often used in writing term papers and formal writing assignments in college courses.

##### I. **ABSTRACT:**

The abstract reports the basic accomplishments of the study. A good abstract entices the reader to read further. An abstract should be less than one page in length and is typically around 250 words. The abstract should include the following items:

- a. Objective of work (purpose),
- b. A brief statement on how the objective was achieved,
- c. A summary of conclusions and recommendations, and
- d. Implications of the work may also be mentioned in the abstract.

The abstract has become particularly important with the advent of digital databases such as the Science Citation Index. The title and abstract are available remotely, in digital form, but the body of the article itself must usually be retrieved in the library. A good abstract encourages the reader to do that.

##### II. **INTRODUCTION:**

The introduction places the work in perspective. It cites relevance, motivation, some previous background, and most importantly, the objectives of the work. If other people have done prior work in the general area of the study or in relevant areas, it is necessary to refer to that work in the introduction.

##### III. **PROCEDURE/METHODS:**

The purpose of this section is to describe the technique and how the experiment, analysis, or modeling was performed. A simple schematic diagram should be included as well as other important data such as the manufacturer and model number of any equipment used. The reader should be given sufficient information to reproduce the study. The procedure section is sometimes called Materials and Methods.

##### IV. **RESULTS AND DISCUSSION:**

In this section, the findings of the study are clearly presented. If results are presented in

graphical form, please be sure the graphs are helpful, clear and informative. The discussion section should place the present results in context with prior results obtained by others. The implications of the work should be discussed as well.

V. **CONCLUSIONS:**

This section should be very concise. The conclusions should refer back to the objectives. Indicate trends, possible sources of error, and how data relate to a model (if appropriate). Recommendations for future work should indicate possible future work or improvement of procedure.

VI. **REFERENCES:**

Reference any articles, books, or manuals used as cited in the manuscript. A standard form for referencing should be used. Each journal has its own format.

3) **Evaluation:**

Evaluate and critically examine each part of the paper.

- I. As for the abstract, it must stand alone, independent of the rest of the paper. Can you understand what was done, why it was done, and what is its relevance? If there is difficulty in understanding, try to discriminate whether you think it is due to a limitation in your background or a limitation in the quality of the writing.
- II. As for the introduction, does the manuscript present a clear picture of the status of the field of research under discussion?
- III. As for the methods, consider whether the approach used, e. g. population demographics and sample size are appropriate to test the hypothesis, if any. If it is a population study, were there any biases which might skew the results? If the study requires statistical inference, are the tools chosen appropriate?
- IV. As for the results, do the authors present the data in an objective form? Do they make it clear the distinction between results and their interpretation? Are the graphs clear and easy to read without extensive reference to the text?
- V. As for the discussion, is the interpretation reasonable? Do the authors attempt to extract too much from the data given?
- VI. Finally, what did you find interesting or uninteresting about the article? If you were to explore the subject in more detail, what would you do? What further knowledge would you wish to acquire to explore the subject?