

BioTAP Rubric I: Assessing the writing

BioTAP Rubric I (items 1-9) assesses the student's ability to communicate clearly about their research to any member of the faculty in the biology department, including their Faculty Reader, Writing Advisor, Writing Instructor, and anyone else in the thesis' target audience. It is worth noting that items 1-5 focus on major writing issues (coherence, organization, etc.), whereas items 6-9 focus on more minor writing issues (mostly associated with correctness). For this reason, items 1-5 will be weighted more heavily than items 6-9 in the final evaluation. To provide feedback to students during the drafting process, Faculty Readers will use **BioTAP Worksheets A**, whereas Research Supervisors

will use **BioTAP Worksheet B**. Although these worksheets provide a basic structure for faculty feedback, additional feedback –whether written, digitally recorded audio, and/or in person – will also help students through the drafting and revision process.

PLEASE NOTE: Best practices in the teaching of writing discourage faculty from extensive line-by-line editing of student writing. Although this practice is commendable in terms of its intent and may improve the current piece of writing, it is extraordinarily time consuming and is less effective than other kinds of feedback in helping students improve their future writing.

1. *Is the writing appropriate for the target audience?* Honors theses should address non-specialist readers with an understanding of basic biology—specifically, any faculty member in the biology department regardless of sub-discipline. Students often struggle to realize that while faculty may be experts within their field of research (e.g., genetics, ecology, development), they are rarely familiar with the language and conceptual nuances of other highly-specialized fields of study. Students should assume their readers understand basic biological processes (such as photosynthesis), but they cannot assume that readers readily remember all the details (such as mechanisms of alternative pathways). Therefore, students should limit their use of jargon, and should explain or define all key terms and concepts that are specific to their sub-field. This item will be assessed using the following standards:

- **Inadequate:** The thesis is written with excessive jargon or is greatly lacking in definitions and explanations, making the research inaccessible to non-specialist readers.
- **Adequate:** The thesis includes some useful definitions or explanations, but some key terms or concepts are still challenging for the non-specialist reader. Non-specialist readers are able to follow the main themes of the thesis, but the writer has not made this task easy.
- **Excellent:** The thesis has sufficient definitions and explanations to make the research accessible and engaging to non-specialist readers.

2. *Does the thesis make a compelling argument for the significance of the student's research within the context of the current literature?* The thesis should contain a substantive literature review that places the student's research within its appropriate scientific context. This literature review should not only describe what is known about the student's topic, but should also identify the specific gaps in knowledge that the student's project intends to address. The student should make an argument for the broader significance of his/her research when addressing these gaps. This item will be assessed using the following standards:

- **Inadequate:** Either the thesis does not present an adequate review of the literature, OR the thesis does not make sufficient connections between the published literature and the student's own research project to explain its significance.

- **Adequate:** The thesis presents a literature review, but either does not place the student's research within the context of current or past scientific research, or does not explicitly present an argument for the broader significance and/or scientific value of the student's research.
- **Excellent:** The thesis reviews the literature, demonstrates how the student's research fills a gap, and presents a compelling argument for the broader significance or scientific value of the student's research.

3. Does the thesis clearly articulate the student's research goals? The student's research statement should include a research question or the goals of the project, and may also include a hypothesis (if applicable) and an overview of the methodological approach. This item will be assessed using the following standards:

- **Inadequate:** The student does not explicitly articulate a research question or the goals of the project.
- **Adequate:** The student articulates a research question or the goals of the project, but at times in an unclear, inconsistent, or disorganized manner.
- **Excellent:** The students clearly and explicitly articulates a research question or the goals of the project.

4. Does the thesis skillfully interpret the results? Student should interpret their results within the scientific context constructed in the Introduction (this should be done in relation to a hypothesis, if applicable). Student writers often overlook the fact that scientific data has complexities that often defy a single interpretation. Therefore, we are also assessing the student's ability to acknowledge this complexity, as well as discuss plausible inconsistencies, uncertainties, alternative explanations, counterintuitive evidence, and/or limitations of his/her results.

NOTE: It is not uncommon for students to have inconclusive or incomplete results – this is perfectly acceptable, and students should not try to obfuscate this fact. We do not expect a student to interpret inconclusive or incomplete results *per se*. Instead, in these cases, we expect students to focus their discussion on the limitations of their results. Hence, if the thesis had inconclusive or incomplete results, please apply the standards outlined in the alternative rubric (4b). Otherwise, this item will be assessed using the standards outlined in 4a:

Rubric 4a (for theses with conclusive and complete results)

- **Inadequate:** There is no interpretation of the results (e.g., a simple restatement of the results) or the interpretation is superficial.
- **Adequate:** The thesis presents a reasonable interpretation of the results, and **mentions** inconsistencies, uncertainties, alternative explanations, counterintuitive evidence, and/or limitations of the results, but does not explain the implications of these potential problems.
- **Excellent:** The interpretation of results is insightful, and the thesis **explains** the implications of plausible inconsistencies, uncertainties, alternative explanations, counterintuitive evidence, and/or limitations of the results.

Rubric 4b (for theses with inconclusive or incomplete results)

- **Inadequate:** There is little or no attempt to explain the reasons underlying the lack of clear results.
- **Adequate:** The thesis provides a reasonably thorough explanation of the reasons underlying the lack of clear results, and includes a reasonable attempt at interpreting whatever results were obtained.
- **Excellent:** The thesis provides an insightful explanation of the reasons underlying the lack of clear results.

5. Is there a compelling discussion of the implications of findings? We expect students to explicitly explain the implications of their research findings within the scientific context constructed in the Introduction. One way students accomplish this is by making the connections between their results and other published results. Another way is by indicating how their projects could lead to future research within their field of inquiry, which could include suggestions for additional experiments and/or alternative approaches. It is appropriate for students to speculate – this is their opportunity to demonstrate understanding of the big picture.

NOTE: Although we *do* expect a discussion of the implications of negative results, this is not appropriate for inconclusive or incomplete results. In these latter two cases, we expect students to focus their discussion on future directions. For theses with inconclusive or incomplete results, please use alternative rubric 5b. Otherwise, this item will be assessed using the standards described in 5a:

Rubric 5a (for theses with conclusive and complete results)

- **Inadequate:** The thesis makes little or no attempt to discuss the implications of the findings or does not describe future directions for the project
- **Adequate:** The thesis makes some attempt to discuss the implications of the findings, but does not explain their significance OR the thesis mentions possible future studies without explaining how they would contribute significant new knowledge to the field.
- **Excellent:** The thesis provides a compelling discussion of the implications of the findings, including a thorough consideration of possible future studies.

Rubric 5b (for theses with inconclusive or incomplete results)

- **Inadequate:** The thesis makes little or no mention of future directions or alternative approaches for the project.
- **Adequate:** The thesis provides some discussion of possible future studies or alternative approaches without explaining how they would contribute significant new knowledge to the field.
- **Excellent:** The thesis provides a thoughtful and thorough discussion of possible future studies or alternative approaches.

6. *Is the thesis clearly organized?* The thesis should be organized in the standard IMRaD fashion (Introduction, Methods, Results, and Discussion). Within paragraphs, sentences should be cohesive and logically organized. This item will be assessed using the following standards:

- **Inadequate:** The thesis does not adhere to the IMRaD organization, or the writing within paragraphs is frequently difficult to follow.
- **Adequate:** The thesis adheres to the IMRaD organization, and the writing within paragraphs is usually easy to follow.
- **Excellent:** The thesis adheres to the IMRaD organization, and writing within paragraphs is easy to follow in almost all cases.

7. *Is the thesis free of writing errors?* The mechanics (spelling, grammar, punctuation) and presentation of the thesis should be correct and professional. This item will be assessed using the following standards:

- **Inadequate:** The thesis contains excessive errors or is presented in an unprofessional manner.
- **Adequate:** The thesis contains some errors.
- **Excellent:** The thesis is virtually free of obvious errors.

8. *Are the citations presented consistently and professionally throughout the text and in the list of works cited?* The citation format should be consistent throughout the thesis, and references should be professionally presented. This item will be assessed using the following standards:

- **Inadequate:** The thesis uses inconsistent citation format, is missing citations, or presents the list of works cited in an unprofessional manner.
- **Adequate:** The thesis uses consistent and appropriate citation format and presents the list of works cited in a professional manner, although there may be some minor inconsistencies or errors.
- **Excellent:** The thesis uses consistent and appropriate citation format and presents the list of works cited in a professional manner.

9. *Are the tables and figures clear, effective, and informative?* Tables and figures should be consecutively numbered, cited in consecutive order, and the captions should be in the appropriate location (above tables, below figures). The thesis should refer explicitly to each table or figure (e.g., "...reveals an upward trend (Figure 1).") and the visual elements of all tables and figures (including photographs) should be clear and easy to read or interpret. The captions should provide a clear description of the table or figure. This item will be assessed using the following standards:

- **Inadequate:** Many of the tables or figures are misleading, incorrect, unclear, or inappropriate, or the captions are incomplete or unclear.
- **Adequate:** In general, the tables, figures and captions are clear and appropriate.
- **Excellent:** The tables and figures are exceptionally well constructed, and the captions clearly describe the visual elements.