

A Model for Facilitating Peer Review in the STEM Disciplines:
A Case Study of Workshops Supporting Student Writing in Introductory Biology Courses

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Methods Supplement

- I. Interview Questions (conducted in Spring 2011)
- II. Faculty Survey (completed in Spring 2011)
- III. Post-Workshop Student Evaluation Form (completed in Spring 2011)
- IV. Current Science Writing Workshop Plan (as of Spring 2014)

Note: We completed our data collection at the end of Spring 2011 because the biology department revamped its curriculum in Fall 2011, moving genetics to the fall semester and allowing it to be taken concurrently with (rather than after) first-semester chemistry, with mostly first-semester first-year students taking genetics, rather than second-semester first-year students with a semester of chemistry and therefore more experience as science students and college students more generally. We felt that data gathered from these students would not correlate well with our previously collected data.

I: Interview Questions

Biology Faculty

1. Have the introductory biology classes always required extended written lab reports? If not, when did they begin and why?
2. What is the origin of the workshops? Who initiated the idea and why?
3. Do you see a difference in student writing before versus after the advent of the workshops (about five years ago)?
4. Have you received any direct feedback from students, either oral or written, about the workshops or about the lab reports in general?
5. How do you suggest we improve the workshops?
6. Could I also email you a brief survey to take online?

Writing Program Faculty

1. What is the origin of the workshops? Who initiated the idea and why?
2. How have the workshops changed since they began (about five years ago)? What drove the evolution?
3. Have you received any direct feedback from students, either oral or written, about the workshops or about the lab reports in general?
4. How do you see science writing as fitting in (or not) with writing in other academic disciplines? How and when can college students use similar and/or different approaches to science writing?
5. Do you have new ideas about how we can teach science/math people that they should care about writing?

Current Science Writing Fellows

1. What have you learned from being a Science Writing Fellow?
2. What have you taken away from working the Bio workshops (as students and/or as Fellows)?
3. How do you see science writing as fitting in (or not) with writing in other academic disciplines? How and when can college students use similar and/or different approaches to science writing?
4. How can we make science writing more accessible?
5. How do we teach science/math people that they should care about writing? Why is it important for people outside of a specific research community to understand results?

Founding Science Writing Fellows

1. Do you see a difference in student writing before versus after the advent of the workshops (about five years ago)?
2. Have you received any direct feedback from students, either oral or written, about the workshops or about the lab reports in general?
3. How do you suggest we improve the workshops?
4. Can I use parts of your responses to quote or paraphrase?

II: Faculty Survey

(completed online via SurveyMonkey)

Numerical Evaluation

Please use the following scale: Poor (1) – Fair (2) – Good (3) – Very Good (4) – Excellent (5) or, if appropriate, indicate that a question is Not Applicable (N/A)

Please rate the following aspects of student laboratory reports:

1. Proper style, formatting, tables, figures, etc.	1	2	3	4	5	N/A
2. Student responsiveness to professor instruction/feedback	1	2	3	4	5	N/A
3. Clarity of writing	1	2	3	4	5	N/A
4. Demonstration of mastery of scientific concepts	1	2	3	4	5	N/A
5. Logical flow of ideas	1	2	3	4	5	N/A

Narrative Evaluation

- Do you like having TAs at the workshops or do you feel that it distracts from the emphasis on writing and presentation?
- How do you see science writing as fitting in (or not) with the writing in other academic disciplines?
- Why is science writing development important to a science major?
- How can we make science writing more accessible? How do we teach science and math students that they should care about writing?

III: Post-Workshop Student Evaluation Form

Course: _____ Professor: _____

Please use the following scale: Poor (1) – Fair (2) – Good (3) – Very Good (4) – Excellent (5) or, if appropriate, indicate that a question is Not Applicable (N/A)

Please rate the following aspects of the workshops:

1. Writing Fellows' ability to stimulate interest in the topic.	1	2	3	4	5	N/A
2. Writing Fellows' ability to encourage participation.	1	2	3	4	5	N/A
3. Writing Fellows' ability to teach writing skills.	1	2	3	4	5	N/A
4. Writing Fellows' specific comments on reports.	1	2	3	4	5	N/A

Please rate the workshop in helping you develop the following techniques:

1. Posing a research question.	1	2	3	4	5	N/A
2. Using proper formatting.	1	2	3	4	5	N/A
3. Structuring the report to have logical flow and order.	1	2	3	4	5	N/A
4. Using sources correctly.	1	2	3	4	5	N/A
5. Revising drafts.	1	2	3	4	5	N/A
6. Writing clear sentences.	1	2	3	4	5	N/A
7. Identifying the strengths and weaknesses in others' writing.	1	2	3	4	5	N/A
8. Identifying the strengths and weaknesses in your own writing.	1	2	3	4	5	N/A

Please rate how helpful you found this workshop. (circle one)

Not helpful Somewhat helpful Quite helpful Really helpful

Did you get out of the workshop what you were hoping for? (circle one)

Yes No

If not, what were you looking for?

IV: Current Science Writing Workshop Plan (Used from Spring 2011 to Spring 2014, although for the past academic year, Writing Fellows have trained the Biology Mentors to conduct this workshop, rather than the Writing Fellows running the workshops themselves)

- I. Announcement Visit (in the laboratory)
 - a. Give the general writing-in-the-sciences talk that describes the sections of a journal article and lab report OR
 - b. Ask that faculty use part of a lab lecture to do this
- II. Reminder Visit (in the lecture classroom)
 - a. Smile, say hello, remind students of the workshop's dates, times, and goals
 - b. Emphasize that these sessions are designed to prepare students for the real process of writing in the scientific world
 - i. Science is presented in large conferences
 - ii. Researchers work in teams, share ideas, compare results
 - iii. Opportunity to give/receive feedback with peers
 - c. Writing Fellows will answer specific questions
 - i. Cannot have one-on-one consultations during the workshops
 - d. Writing Fellows give advice on the writing and formatting and proper division of sections
 - i. Writing Fellows do not actually correct the science
 - ii. For science interpretation questions, students ask TAs or professors before writing the report
 - iii. Students also use workshop time to see how peers analyzed different results and incorporated them into discussion
- III. The Workshops
 - a. Introductions
 - i. Fellows give their names, years, and majors
 - ii. Goal of the workshop: help students improve reports, somewhat flexible format
 - b. General questions
 - i. All together as a large group
 - ii. Ask students what questions they have that would apply to most people in the room
 - iii. Address issues of what to write about in a particular section, how to format or cite, etc.
 - c. Preemptive questions
 - i. Fellows give a brief talk about some of the FAQs that have come up for this lab report
 - ii. On nights other than the first, pose questions that have been brought up by students
 - iii. Address professor-specific requirements concerns
 - iv. If there is explicit scientific/statistical information from professors, explain it and tell students to discuss it with their lab partners
 - d. Typical problems
 - i. Figures without legends, titles, axes that make sense, etc.
 - ii. Results section without logic or consistency (should be like a narrative)

- iii. Discussion section that does not step away from the results section to offer interpretation
- iv. Citing references without showing their particular relevance
- v. Results are not analyzed in context with the raw data
- vi. Misinterpretation of results (though not the Writing Center's job)
- vii. Sections clearly written by different students
- viii. Complete failure to present some results
- ix. No logical framing in the intro (jumping right into a specific topic)
- x. Results section is completely qualitative and not quantitative
- xi. Level of formality; do not say "in this lab;" use something more like "in this project/research"
- e. Break up for peer review
 - i. Allow students to work with their lab partner if they want
 - ii. Encourage peer review and facilitate "matching" if necessary
 - iii. Use rubric that professors will grade with
 - iv. Encourage them to ask questions of the students near them
 - v. Use other students' work-in-progress as models when questions are asked
- f. Have each student fill out evaluation form before leaving