Using Peer Review to Promote Better Scientific Writing for Chemistry Graduate Students

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Emory University Woodruff Library
What was the impetus?

- Professor, Emory Department of Chemistry, Spring 2010

- “Hi Donna:
Since many of the graduate students have weak writing and organizational skills, the library paper becomes a “learning opportunity” for them, more so about professional writing than about the actual library topic. The challenge is to figure out how to make the exercise a useful one from that professional writing perspective....”
The course I teach, CHEM 597R

- Required one credit course
- 25 year history
- Meets prior to 1st & 2nd semesters, & for individual one-hour research consultations 2nd semester
Course Requirements LibGuide

- http://guides.main.library.emory.edu/chem597r
2nd semester research paper includes...

- A research advisor assigned topic
- Individual one-hour research consultation with the librarian-instructor
- Writing the Scientific Research Paper and Peer Review Process

- [http://guides.main.library.emory.edu/chem597scientificpaper](http://guides.main.library.emory.edu/chem597scientificpaper)
The Purpose of Peer Review:

to assist students in considering how valuable critical scrutiny is in improving one’s own work and presentation
What are the responsibilities of a reviewer for the assignment?

- Critical, careful reading of entire manuscripts
- Thorough, unbiased reviews
- Manuscripts reviewed and returned on time
- Anonymity of authors and reviewers
- Confidentiality and courtesy is expected
- Copies of papers reviewed are expected to not be kept or used
- Reviews should be supportive and helpful
“Guiding questions” addressed in the peer review process

1. Topic Development
2. Background Theory & Context
3. Data
4. Figures
5. Paper
6. Bibliography/Literature Review
7. What was learned? What insights were gained?
What are Rubrics?

- Key performance criteria & standards linked to learning objectives & used to subjectively assess expected outcomes

What are the guiding rubrics used in the peer review process for this assignment?

Guiding Rubrics Continued

• Adherence to rubrics improves overall quality of writing

• Used to evaluate colleague papers in peer review process

http://guides.main.library.emory.edu/chem597scientificpaper
Rubric Evaluation Worksheet

- **Methodology:**
  - Final papers sent electronically to instructor
  - Papers sorted by division: organic, inorganic, physical, biological
  - Papers assigned in alpha & numeric code – to keep papers anonymous
  - Two papers scanned to each reviewer within the same division
  - Worksheet completed by reviewer for each paper [http://www.surveymonkey.com/s/BPC95LR](http://www.surveymonkey.com/s/BPC95LR)
  - Worksheets (peer reviews) returned to instructor; resorted, scanned & returned to authors
  - Authors use comments to revise their papers
  - Papers are sent to research advisor & resubmitted to instructor for final grading
  - Grades submitted to the Graduate School of Arts & Sciences
### Conclusions – Student Worksheet Responses

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### Student Responses Continued –

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Student Evaluative Review & Comments

- Written comments were supportive & helpful for authors and included many suggestions for improving writing & presentation
- Example 1:
  - Q. Did the Author give a concise, appropriate background discussion of the topic & discussion of its’ significance, scope, & limits?
  - A. “The topic is nicely related to the energy crisis but scope & limits are not really looked into. A nice addition might be examples of other WOC systems and why POMs are superior.”
Example 2:

Q. Did the author outline what has been done before by citing pertinent literature?

A. “Yes, very well, with many examples of the different kinds of transformations employed for tetra–substituted alkene synthesis. One thing noted was that no example of a Heck reaction to form a tetra–substituted olefin is given, even though it is mentioned in the introduction.”
Faculty Comments about Improved Student Writing & Organizational Skills

- Example 1:
  - Q. Overall, how would you rate the quality of student writing in CH597 papers?
  - A. “Getting better.”

- Example 2:
  - Q. Over the past two years, do you think peer review may have helped students to improve their writing?
  - A. “Yes.”
Faculty Comments Continued

• Example 3:
  • Q. Are there other opportunities for students to peer review the writing of fellow students in the department?
  • A. “A few. But reviewing the sciences and the writing of major researchers in their submitted manuscripts is also of major potential value to PhD students.”
  • A. “We do a great deal of peer review in the ORDER [undergraduate] class, and the exercise can be both valuable & beneficial.”
Example 4:

Q. Is this a useful exercise for exposing students to peer review & for the possibility to improve their writing?

A. “Yes. I ask them to review research manuscripts and then I follow with a review of the review... then the student can compare their review and mine.”

A. “Yes. I certainly support your efforts.”
Any Questions?

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