# Establishing Author-Editor Interdisciplinary Learning Communities

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Imagine undergraduate students gaining the skills and knowledge necessary to write and publish peer-reviewed journal articles. Conceive of student interactions across disciplines that foster conversations about writing. In the process, envision students internalizing rhetorical and editorial skills, including evaluation and critique. Establishing author-editor interdisciplinary learning communities is the way we have attempted to accomplish these goals.

Starting in 1998, we have connected a total of eight different courses between the department of Biology and the department of Language and Literature in order to expose science majors to a unique opportunity to improve their writing and to provide English majors an opportunity to serve on something resembling an editorial board. The premise is that the biology students generate manuscripts using directions to authors found in peer-reviewed journals in the field of biology. The pretense is that their "laboratory reports" are products of authentic research. Meanwhile, the English students take on the role of expert editors. Though not content experts, the English students represent an educated audience that expects clear writing, the kind of writing that the biology students should be able to achieve. The courses we connected in these learning communities range from senior down to first-year levels, courses such as BIOL4480: Developmental Biology, BIOL3430: Cell Biology, BIOL1260H: Honors Environmental Science, ENGL4901: Teaching English, ENGL3050: Applied English Grammar, ENGL3100: Advanced Composition, ENGL1102:

English Composition II, and ENGL1101: English Composition I.

It is important that the collaborating colleagues share similar pedagogical goals. Together they draw up a detailed project design, including the choice of appropriate courses in both disciplines and appropriate procedures and tools of assessment. These choices are not static; they can actually be quite flexible, responding to specific needs of specific courses. For instance, the type of writing assignments may vary: a laboratory-based course could generate experimental data to produce an authentic research manuscript, while other courses could be better suited for the production of literature-based review articles. In other words, in any given semester student authors may submit three or four laboratory reports in the form of manuscripts, or they may write essays in the form of review articles. The step-by-step outline of the experience during a semester involves careful planning and timing of each assignment. Multiple assignments need to be scheduled far enough apart to allow for a sequence of reviews, feedback, and revisions. Technology is also critical. Although we form the learning communities, members of which share experiences, individual identities are kept secret across the disciplines through the use of technology.

The directions to the biology student authors are an imitation of standard academic science journal directions. They are an amalgam of guidelines assembled from various journals in the field of biology and include directions for writing each segment, such as the abstract, introduction, methods and materials, results, discussion, and list of references, as well as overall requirements for formatting, language use, and length. The directions to English-student editors mirror those given to the biology students, with additional emphasis on specific language usage appropriate to scientific journals.

Biology students work individually or in groups of three or four, depending on class enrollment, producing manuscripts that are submitted electronically, identified only through a code word or phrase. Editorial comments and proposed grades are returned electronically by the English students' groups of four or five, which are also identified by code words or phrases. For instance, names of groups have been as esoteric as "EDVOTEK" and as obvious as "BioBuddies." The only individuals who are aware of the membership of groups are the two instructors. The groups are formed randomly early in the semester and they are maintained throughout all assignments. One group of English students edits and comments

on all of the products of one group of biology students, maintaining the continuity of editorial observations and allowing the accurate recording of errors and improvements in writing.

Instructors act as conduits, responsible for properly distributing papers and comments and for maintaining continuity of the anonymous communication. During the exchanges, each instructor reviews the work of each group, checking to make sure that the work is done according to directions. Furthermore, the biology instructor critiques the content of the biology papers and returns those comments along with those of the English students, whose comments and evaluations are based solely on rhetoric, logic, and grammar. The grades awarded by the English students are considered as recommendations—ultimately grading is the sole responsibility of the biology instructor. Grades for the biology students are determined by their drafts and final papers on a twenty-five to seventy-five percent ratio. The biology students are expected to make a choice of which recommended changes to incorporate in order to improve their manuscripts. After all, not all editorial comments are useful.

English students are responsible for capturing the entire experience in reflective essays at the end of this multifaceted project. These essays must contain, as supportive evidence, examples of the kinds of textual, marginal, and end comments they have made. The English students' grades are determined by the quality of their comments as well as their reflections. The instructor evaluates the specificity and accuracy of the intertextual notations, as well as the perceptiveness and usefulness of the marginal and end feedback. Students are encouraged to suggest the existence of problems with the texts rather than merely correct or edit them. For instance, if there is an unclear referent, the English students need to identify the problem by demonstrating their confusion rather than correct the problem by supplying a concrete noun.

At the end of the project, all of the students evaluate the experience, answering discipline-specific questionnaires. Students also do intra-group peer review to clarify the role and individual effort each member has contributed to the group work. Upon completion of the assignment, each group is awarded a grade by the instructor. However, students are given the opportunity to adjust grades within a twenty percent point range. In this process, each member of a group anonymously recommends a weighted grade for each of the other members of the group. The instructor averages those recommended grades to calculate each student's final

grade. Further qualitative intra-group peer review is performed through the use of an evaluation tool, which includes questions relating to the amount of work performed by each member of the group, availability of the individuals, and overall participation in the project.

The key part of the process for establishing author-editor interdisciplinary learning communities is the instructors' detailed preparation of the students by outlining expectations and clearly articulating specific demands of manuscript writing and editing. The biology instructor gives her students extensive instructions on manuscript preparation, outlining characteristics that are used for assessment, such as format—including figures, tables, and citations—and the specific type of content found in each individual portion of the manuscript. She further prepares them by explaining the need for anonymity, and by discussing acceptance and evaluation of peer feedback. Additionally, the instructor monitors students' attitudes and progress throughout the project. Meanwhile, the English instructor informs English students of all the expectations given to the biology students and teaches them how to critique, and how to weigh equally the three areas of rhetoric, logic, and grammar in determining a grade. The English class discusses appropriate content and tone for the textual, marginal, and end comments.

We give students in both courses extensive guidelines for how to work effectively in groups. Both of us (an English and a biology instructor) predicate the discussion by pointing out that everyone will have to work in groups in their future careers. We also discuss with our respective students the importance of working in groups, emphasizing the need for each individual to participate fully. Students are asked to resolve group problems among themselves, and we suggest that they will have failed in the project if they cannot. We anticipate the most common problem that groups will have—establishing meeting times—by suggesting students meet electronically through email or WebCT environments.

We ask the biology students to rotate roles every assignment so that each member experiences each role and the workload is evenly distributed. These roles include searching for relevant literature, performing statistical analysis of the results, presenting final results in the forms of tables and figures, and drafting the various segments of the manuscript. All members of each group are expected to participate in the final review of each draft or manuscript.

A significant part of the preparation is to make all students aware of

the purpose of the project, which is to develop their skills as authors and editors. In almost any assignment, if students do not grasp its purpose they will not perform as well as if they fully comprehend the outcomes. Though students often display apprehension at the beginning of the project, they eventually comprehend the effects of the process, respond to the demanding tasks, and recognize the ultimate benefits.

Throughout our collaboration, we have made adjustments based on our observations, both anecdotal and assessment-based, with the ultimate goal of making a change in the writing performances of our students. Initially, we exchanged three assignments between our courses, with first drafts written by the biology students, submitted for comments, and returned for revision. The final report was then awarded a grade by the biology instructor. By the third assignment, we became sensitive to the fact that the biology students minimized their efforts put forward to write the first drafts; they were expecting to receive excessive feedback from the English students and then perform massive revisions and additions to produce their final reports. That observation prompted the reconfiguring of the grades the following semester: a percentage of the grade for each report was given to the first draft and a greater percentage value awarded to the final report. Our recommendation would be 25 to 40 percent for the draft and 60 to 75 percent to the final report, depending on the type of assignment.

Another variation to this process was introduced based on the way papers were written—whether by individuals or in groups. Occasionally we had classes with small numbers of students, and we decided to require individual papers instead of group reports. This change reminded us of the advantages of group work. We noticed a reduction in the average grades of the individually composed papers compared to those awarded to papers composed by groups. Although we cannot yet statistically support this comment, we believe that group work on average results in better products. The lower average performance levels in individual products could be a random phenomenon of one class, but we don't think so as we observed that group work protects against individual weaknesses, delays, and lack of electronic fluency. Among the students who performed individually, there were serious problems regarding students who were weak in writing skills, inconsistent in meeting deadlines, and unable or unwilling to learn how to use email or WebCT. In all the other courses, where group work was expected, these symptoms, although present, were

mitigated through the strength of group performance. Not until we observed these individual performances did we realize how much intra-group interaction improved performance. Students who were assigned individual projects tended to communicate only with the instructors, despite our encouragement to seek advice from other students. This lack of peer communication extended to every aspect of the assignment: students asked the instructors for assistance in everything from writing, to content, to technology, to revision. However, students given the same assignments in groups relied on one another for information, ideas, and support.

The exception to what is now our policy of requiring group work is the writing of the final self-reflective essay for the English students. This assignment was completed as a group activity the first semester, and student evaluations suggested that the exercise would be more meaningful if each one of them could explore individually the differences the project made in their editing and revision skills. In all subsequent semesters this final reflective essay has been an individual assignment, and each student has extensively critiqued improvements in these writing skills.

When we assign group work, each group does all three assignments throughout the semester. We ask students to rotate individual contributions and duties among themselves, but we expect them to perform final integration of the report together. Everyone has input and responsibility for the grammatical and stylistic integrity of the final project. Therefore, this synthesis can be achieved only by groups with strong group skills.

Our future plans include further investigation of the benefits of intra-group interaction. We are accumulating evidence that most of the time weaker students paired with stronger students benefit from this peer-based learning and improve their grades. Students' individual talents and interests complement one another to improve the composite performance of the group. We also plan to conduct a longitudinal study to determine how students have subsequently incorporated the experience—particularly in writing, editing, and group work—in their personal and professional lives.

In fact, the benefits of group work are not specific to the students. We, as instructors, have gained from the collaborative nature of the experience, particularly because of the extensive assessment methods we have employed and the subsequent self-examinations and continual discussions between us. A vital and exhilarating point of our process is the constant scrutiny and revision of our methodology. Since the first semester we engaged in this collaboration, we have made modifications based on in-

put from our students: perceptions from our interactions with students during the semester, information gained through assessment tools, and overall student performance. However, assessment has extended beyond our teaching experiences to include our professional development activities. We have continually researched the existing literature—from sources such as the *Journal of College Science Teaching* and the *English Journal*—and discussed the project with our peers within our disciplines and with colleagues at various conferences. Colleagues have been generally enthusiastic, valuing our project as an innovative use of writing and considering it as a model for implementation in their own teaching. Like our students, we have grown immensely with the self-reflective essays we have written for presentations and publication. We too have learned from our interdisciplinary author-editor community.