

Issues in Having International Teaching Assistants in Engineering Evaluate Undergraduate Writing

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Introduction

ABET's EC 2000 has caused engineering departments throughout the nation to cast a well-deserved look at the state of engineering communications within their curriculum. Although engineering professors are well aware that excellent communications skills are essential in their profession, it is sometimes difficult, given the hefty content of most undergraduate courses, to convince these professors to consider making assignments containing oral and or written communication components. As much research has pointed out, engineering professors have other valid reasons—such as their concern about their own ability to teach communication skills and the burden of grading them—that may add to their reluctance to assign writing in engineering courses.

One spot in the undergraduate curriculum where written communication skills often account for part of an assignment grade is in the context of the first- or second-year lab course. In fact, learning discipline-specific communication skills is one of the essential purposes of lab courses¹. This is a crucial time when undergraduate students first begin to learn engineering discourse as an entry into their chosen academic community. Until this point, most engineering students have only written the typical personal narrative papers assigned in freshman English composition courses. Two of the writing skills most needed in lab reports—summary and paraphrase—are rarely dealt with in lower level English composition textbooks². The lab report is a unique genre with format and conventions all its own^{3,4,5,6}. Students in lab courses need to learn the rhetorical components and organization of the lab report; they need to be aware of its purpose and audience. Visual elements such as graphs and charts must be included and explained in the text. Some of the principles learned in writing in these first lab courses—such as the keeping of precise details in the lab notebook—are employed throughout the careers of engineers in industry¹.

The Issues

Given the importance of the undergraduate lab report both for ABET purposes and as a keystone in the professional future of engineering students, it seems as if its evaluation of the report should be given special attention. In most engineering schools, this task falls into the hands of the lab graduate teaching assistant. Not only is the lab teaching assistant often a new graduate student, but due to the current demographics of higher education in engineering in the U.S., s/he is also likely to be an international student and a non-native speaker of English. According to the 2000 edition of ASEE Profiles of Engineering and Engineering Technology Colleges, in

1999 nearly fifty percent of doctoral degrees in engineering and forty-one percent of master's degrees were awarded to foreign nationals⁷. In the ASEE figures, the percentages ranged from 24.7 percent at the University of California at Davis to 87.1 percent at the New Jersey Institute of Technology. Even though these figures do not indicate how many of the degree recipients actually served as teaching assistants (as opposed to holding research assistantships or fellowships), given staffing needs, it is likely that many did. [It should also be noted that a significant percentage of international undergraduates also major in engineering.] Of course, the nationality of the individual who is evaluating undergraduate lab reports is not solely an international teaching assistant issue, since engineering teaching assistantships are not allocated on the basis of a graduate student's qualifications in writing, but the role of international teaching assistants in the lab class does raise several unique questions.

The first question is instructor credibility. Back in the mid-1980s and earlier, universities were often criticized for using "incomprehensible" international graduate students as teaching assistants, and some state legislatures mandated the establishment of programs to prepare these students linguistically and culturally to teach in American college classrooms⁸. Most international teaching assistants now teaching have met some type of English language proficiency criteria, and many undergraduate students, while still struggling to understand the speech of some of their teaching assistants, readily acknowledge that they are being taught by some of the smartest students from abroad. But it may be more difficult to give the TA the benefit of the doubt when that teaching assistant speaking an accented and grammatically imperfect English is put in the awkward position of evaluating the English of a native-speaking undergraduate student. Although standardized tests such as the Test of English as a Foreign Language (TOEFL) and the GRE Verbal tend to show that many international graduate students score quite high on these passive tests of English grammar, there is not much of a correlation between these test scores and the ability to write. The main standardized measure of English writing proficiency, the Test of Written English, is not required by most graduate programs in engineering.

Related is the issue of instructor self-confidence; many international teaching assistants naturally feel quite uncomfortable being placed in the position of evaluating the English of their students. Not only do they doubt their own English, but they question their ability to evaluate the writing of others. The latter is a legitimate concern shared by native-speaking teaching assistants and engineering professors, both native- and non-native speakers of English⁹. The international teaching assistant training programs mentioned earlier focus on spoken communication skills, and because these programs often serve a campus-wide clientele, they cannot be charged with teaching TA how to evaluate discipline-specific writing. Published research on programs to help engineering teaching assistants learn how to evaluate undergraduate writing is quite thin¹⁰ (The University of South Carolina is a notable exception; also see¹¹); the issue of special considerations in the training of international teaching assistants to evaluate undergraduate writing rates little or no mention in the literature.

Assuming an international teaching assistant is quite fluent in English and feels no qualms evaluating lab report writing, a couple of genre-related issues persist. Few studies exist in the area of the contrastive rhetoric of academic writing, especially in non-Western countries, from which the majority of international students come, these teaching assistants' familiarity with the

conventions of the North American lab report is questionable. In terms of general writing in English, it has been shown that there is little actual instruction in writing in some countries⁹, and very little exposure to academic English in others¹². It is also known that some Asian cultures differ in their expectations of reader- versus writer-responsibility for discerning the meaning of the prose. Research has shown that the results of a lab experiment are considered much more important than the organization of the report, yet in North America, organization is dominant. In a study of engineering professors in Hong Kong, one professor noted that "...teachers, for their part, could extract meaning from the students' disorganized writing; as long as they got the correct answer, faulty English did not matter"⁹. Yet a lab report written in North America must be explicit so that it can be followed by others, perhaps at some later point in time. In addition, the sections of these lab reports tend to be quite conventional, at least in any particular engineering discipline. Besides including certain prescribed sections—abstract, introduction, theory, solution, results, and conclusion—these sections usually occur in this particular order.

Another grading issue has to do with the cultural relativity concerning academic dishonesty. Unfortunately, cheating is a major problem among many engineering students in a large number of North American universities, and teaching assistants need to be attuned to its various forms in lab classes, especially when there are many international undergraduates enrolled. First, because engineering students perform the in-class experiments with partners, one student may copy from the other. Collaboration on assignments occurs—and is an accepted practice—to a much greater extent in some other countries¹³.

Second, engineering students sometimes copy verbatim from the course lab manual, "neglecting" to put the borrowed words in quotation marks or cite the reference. Some students also download information from the Internet, which they do not attribute to the website. In some of the countries where our international teaching assistants went to school, it is considered wrong to change the printed words of an authority¹⁴. Students are taught to write by directly copying texts. It has been suggested that some of the "cut and paste jobs" found in lab reports written by non-native speaking undergraduates may be the result of inadequate instruction on the part of their teaching assistants⁹. Another take on this situation is that because of their own shortcomings in English, some international undergraduates may not be able to change the words¹³.

Third are the infamous files of old lab reports kept in dorms, fraternities, and sororities; the practice of student groups retaining past lab reports may be unfamiliar in other countries. Because experiments are not always changed every semester, some students consult and copy from these files. No matter what form plagiarism takes, international teaching assistants need to be vigilant in their grading of lab reports and know the proper procedures with which to deal with the cheating.

Suggestions

Fortunately, the aforementioned issues, inherent when international teaching assistants are needed to evaluate undergraduate writing, can be addressed.

The first proposed solution involves more extensive orientation and mentoring of new lab teaching assistants, both international and native-speaking. Many universities conduct campus-wide orientations for new graduate students, and many engineering schools or departments supplement these with discipline-specific programs. Often, though, the orientation programs are held before the semester begins, and new teaching assistants, especially when they are also new graduate students, may be overwhelmed with “information overload” at that point. A good idea is to have a special workshop on evaluating undergraduate writing when the first lab reports are about to be assigned. Because many students, especially non-native speakers of English, indicate that they have learned to write through the use of models¹⁵, including a copy of a well-written lab report (with clearly written instructions) in the lab manual will benefit both undergraduates and international teaching assistants alike. Since new teaching assistants probably have never graded any assignments before, they need to receive explicit instructions¹⁶. One frequently mentioned strategy is to have teaching assistants all evaluate one lab report together, followed by a discussion with the course supervisor.

Marking lab reports does not need to be a labor-intensive task. Holistic evaluation of lab reports can make the burden of grading easier for international teaching assistants and tends to well-received¹⁷. Holistic grading refers to an impressionistic scoring of a paper based on a pre-established set of writing guidelines. While holistic rating is most commonly associated with large-scale writing assessments, such as the GMAT or Test of Written English (TWE), administered by Educational Testing Service, it can be quite useful in providing quick and valuable feedback to engineering students¹⁸. By developing a scoring rubric, or guide, “...that favors formative assessment (focused on writing comments that lead to both better writing and better engineering) over summative assessment (which sees writing ability as separate from engineering design)”¹⁹, teaching assistants can show their students that good engineering and good writing are inseparable.

Of course, international teaching assistants may want to supplement their holistic evaluation of lab reports by making written comments. Research reveals that students in introductory engineering courses, in their early exposure to the lab report genre, benefit from directive, as opposed to the types of facilitative comments favored in the humanities⁶. Another useful supplemental commenting strategy is for the teaching assistant to note patterns of errors, rather than remarking on individual instances¹⁰.

Conclusion

Hopefully, this paper will heighten awareness of this important, and neglected, issue in engineering education. Supervisors need to take into account the special rhetorical and cultural needs of their international teaching assistants in planning orientation and mentoring sessions for new teaching assistants who will be responsible for evaluating undergraduate lab reports. Increased multidisciplinary research involving such fields as engineering education, technical or professional writing, and English for Specific Purposes needs to be undertaken.

Undergraduates, international teaching assistants, and engineering program curricula can benefit from an increased emphasis on lab reports. Undergraduate students learn the proper format and begin to think like engineers. For international undergraduates, who share the same type of

background in instruction in written English in their native countries as some of their teaching assistants, having teaching assistants who understand their rhetorical needs will help them adapt to the expectations of the lab report. International teaching assistants may become more comfortable in their jobs, and by familiarizing themselves with the style of North American lab reports, they can learn what is considered good writing in engineering. Attention to textual concerns in their students' writing may well pay off for international graduate students when they are writing their thesis or dissertation¹¹. In addition, it has been suggested that training in the evaluation of engineering writing may even help international teaching assistants when they enter the job market²⁰. Finally, engineering programs produce engineers who can communicate more effectively when good communication skills are reinforced starting with the first lab course.

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