Work in progress – Application and Assessment of Student Formal Laboratory Reports using a Teams Approach with an Author and Editor Format

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Abstract – This work in progress presents a teaming approach to writing laboratory reports. A journal-style format of authoring and editing is used. The author and editors are assessed as a small group and share the score on the report as a team. A student perception survey was performed for each of two semesters of this project and the results are compared and presented along with student comments and suggestions for improvement.

Index Terms – engineering writing, peer editing, peer review, small groups.

INTRODUCTION
Written communication skills are an essential outcome of the engineering technology program. In the academic setting, individual reporting of laboratory results or projects are the typical measured outcome, which is demonstrated as the proficiency and achievement of the student. However, in an industrial setting, most reports are a team or group effort with individuals acting as authors to their part of the project and as editors for others in the group. Students typically have a limited exposure to this type of activity [1]. The work presented here attempts to develop a method for group reporting.

A team approach to formal laboratory report writing using a journal-style author and editor method is used in a junior year electrical engineering technology course. This work uses a combination of peer editing [2, 3] and small group project [4] methodologies. As author and editor in peer editing, the students gain insight into other students’ writing expertise. Better student writers help those who need improvement, while less successful writers gain insight into better writing techniques. The resulting report is treated as a small group project in that the score for the report is shared by the team. This variation of the peer editing format and small group project provides incentive and motivation for the students to achieve the final goal of a complete and high quality report.

METHOD
All students perform the same laboratory experiment as required with a lab partner in the normal framework of the course, regardless of report. From an instructor assigned group of students (typically 2-4 students), one student is designated the ‘author’ and the remainder are ‘editors’. Following completion of the laboratory assignment, the author writes the formal laboratory report. The author then submits the report to the group editors within a three day period. The editors edit the report based on their personal writing experiences and skills within a one day period. The full group must then meet and discuss the edited report manuscript with the author. This process can be repeated as often as desired by the group.

The students fill out group assessment forms rating the efforts of their fellow members. Group members share the overall report score, with the rating form allowing for deviation in score if required. The author and editor activities rotate with each new laboratory activity until all members have performed as an author.

This course is the fifth in a series of electronic and circuit courses and the formal report writing requirements match those of students’ previous courses. The key change for the reporting requirements is the group aspect.

RESULTS
A direct comparison of lab report activity for the two semesters under the team formal reports to previous laboratory reports is not possible. Prior to this effort, formal reports were not incorporated in the course, only an executive summary and results report was required.

A student perception survey was given to the students to assess their views on the group reporting and to detail any strengths or weaknesses in the program. The following is the list of student survey questions. The scores are based on a scale of 1-5, where 1 is a response of STRONGLY DISAGREES and 5 is a response of STRONGLY AGREES. The result of the survey for each semester is shown in Table 1.

Student perception survey questions:
1. An effect of team formal reports was reduction in lab report workload for the semester.
2. As an author, I found the process of review and editing helpful.
3. As an editor, I gained an appreciation of appropriate writing techniques.
4. My motivation to meet team report requirements was higher than for individual reports.
5. My individual reports improved as a result of the team experience.
6. The process for team reporting was clearly explained in the syllabus and during laboratory verbal instructions.
7. The shared team report grade was assigned fairly.
8. I received the material from my team members in the specified time guidelines either from authors or editors.
9. I took seriously my responsibility to the report team as an author.
10. I took seriously my responsibility to the report team as an editor.
11. The team reporting experience was beneficial and I recommend continuing it for future semesters.
12. Of the X formal lab reports, my group actually met (not via e-mail) all together for _____ of the X (where X the number of formal reports required for that semester).

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<thead>
<tr>
<th>Table I</th>
<th>Student Perception Survey Results</th>
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<td>Question</td>
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The first semester (Fall 2004) used instructor chosen, randomly selected group of three students for the first three labs, followed by a new random grouping of four students for the next four lab reports. The results of this initial effort for that semester and the student survey indicated that students lacked motivation (question 4), there was an issue with getting material disseminated to group members (question 8) and that the group actually met in person only 49% of the time (question 12). Also, this semester had a dysfunctional group that had to be disbanded, as well as a few groups with non-performing members (3 students total).

From student comments, it was determined that the random assignment of group members was an issue for the students. The initial rationale for a randomized group was to provide interaction among the student with peers that they may not have had involvement in the past emulating the journal-style author/editor process. A sampling of comments made on the Fall 2004 survey:
- Editors did not edit harshly enough, they were too afraid of criticizing.
- Stricter guidelines for getting the reports to editors with editors held accountable for their effort.
- Severe penalties for ‘slackers’.
- Improve the group selection, such a self selection or lab partners.

No motivation in the lab when not required to be author, performed minimal work.

The second semester was modified to use lab partners (group of 2) for the first two labs, followed by 2 pairs of lab partners (group of 4) for the last four lab reports. The results of this semester and survey indicated an improvement in some key areas. There were only two reported non-performing individuals and no dysfunctional groups. The rationale of employing sets of lab partners was based on the premise that a student is more motivated to work with individuals with whom they have an ongoing commitment, such as a lab partner, or the partner team sitting next to them.

The results for the Spring 2005 semester survey showed improvement in the student motivation (question 4), material dissemination (question 8) and the number of meeting times (question 12). However, the perception survey indicated a reduction in the teaming effort as helpful on an individual basis (question 5) and the team responsibility as an author (question 9). A sampling of student comments made on the Spring 2005 survey:
- Recommend that some sort of scoring and/or recording of meetings be attached to group assessment form.
- Need to be a way to ensure that the labs are written and discussed within the given timelines.
- Have the editors turn in their edited report to help with scoring and prove their effort.
- Make sure students know the benefits of team reporting and that constructive criticism is helpful.

**Conclusions**

This work will continue for future offerings of this course. Analysis of the data showed some improvement in key areas as discussed. The results of the analysis are not definitive for this small data set, as can observed from the change between question 8 and 9, where a decrease is observed for responsibility as an author, but a similar increase is observed for responsibility as an editor. More work and refinement of the process will occur.

**References**