

Enhancing TA Grading of Technical Writing: Developing a New Tool Based on Feedback

Krista M. Kecskemety, Andrew H. Theiss, and Rachel L. Kajfez

The Ohio State University, kecskemety.1@osu.edu, theiss.19@buckeyemail.osu.edu, kajfez.2@osu.edu

Abstract - Engineering programs throughout the country are increasing the amount of technical writing in their curriculum because technical communication is recognized as a highly valued skill for engineers. While collaboration with university and department writing centers can be valuable, including technical writing in the context of engineering classes is essential. As the amount of technical writing increases in the classroom, it is important to train those responsible in providing feedback, whether it is faculty or teaching assistants (TAs). This training is essential, as a lack of appropriate grading training may lead to TAs feeling inadequate or unprepared for providing feedback for students, which can become a barrier to including technical writing effectively in the classroom. The work presented in this work-in-progress paper will report on a new tool developed to give technical writing grading training feedback to TAs of a First-Year Engineering Program (FYEP).

Index Terms - Grading, Teaching assistants, Technical writing

INTRODUCTION

The training of TAs both graduate TAs (GTAs) and undergraduate TAs (UTAs) is important [1] and the methods used by universities are varied, inconsistent, and sometimes the efforts are very minimal consisting of only one day [2]-[4]. Additionally, with the emphasis on technical communication that is emerging in engineering education [5][6], having teaching TAs to provide valuable feedback and assessments is important [7]. Over the course of the 2014-2015 academic year, a new method of training TAs for the grading of technical writing was implemented in the FYEP at The Ohio State University. Following the training, a series of focus groups were held with both GTAs and UTAs in the various tracks of the program to gather information and data about the training. While the data provided insightful information about the entire process, it also led to the initial development of a tool to provide real time feedback to TAs related to their grading of technical writing.

This work-in-progress paper outlines the focus group methods and data collected that is supporting the creation of such a tool. It also provides an initial perspective on the tool and its key features. Through the work-in-progress format, we hope to gain additional insights into ways to improve the

tool and make it useful for other programs so that we can better train TAs to grade technical writing in engineering more broadly.

This work-in-progress paper demonstrates the use of the research to practice cycle highlighted by Jamieson and Lohmann [8]. This work initially grew out of educational practice where we saw a need to improve the grading of technical writing completed by our TAs. This gave way to a new method of training that was assessed using research practices through focus groups. Those focus groups provided insightful answers and revealed new areas of possible development. To continue with the research to practice cycle, we also discuss our assessment of the 2014-2015 training and our research plans for the future.

I. Past Work

Training of TAs for grading technical writing previously consisted of only a single, two-hour session at the beginning of the fall semester. In this session, TAs would work in groups and grade a sample lab report while lead GTAs would facilitate and answer questions. After this session, no follow-up or further instruction was provided unless there were issues or concerns that arose in grading.

Beginning in the Autumn semester of 2013, the honors sections of the FYEP began a new effort to improve and expand the grading training for technical writing provided to TAs. The method was modeled after the training performed at Purdue University to grade model-eliciting activities (MEAs) [9]. The first step was to collect sample technical writing assignments that represented a range of grades. We then established a baseline score and acceptable range for each grade category of each writing assignment. This was accomplished by a team of faculty members and GTAs who independently graded each assignment and then had a meeting to discuss and set these baselines as well as create marked-up, graded examples.

The process that followed the creation of the training materials is shown in Figure 1. As shown in Figure 1, the next phase of the expanded grading training consisted of an initial training session, take home practice grading, and follow-up calibration session. At the initial training session, an overview of the grading process was provided, and TAs were given a sample lab report to grade in small groups. After the grading activity, all TAs were provided with an example (i.e., the graded copy of the assignment they had

been working on in groups) so that they could review and compare it with their own grading.

Following the initial training session, TAs were given two more technical writing assignments to grade. These were graded and returned by a set date, and the grades were recorded in a spreadsheet that compared these scores to the baseline scores established for each writing assignment. If the given grade was different from the average and outside of the established standard deviation, the grade was labeled either green for “too lenient” or red for “too harsh.” This spreadsheet containing the TAs; grades, the baseline grades, and the color-coded feedback was returned to the TA, along with both the marked-up example of the assignment and a short note that commented on the both the quantity and quality of writing feedback.

Having received this second round of feedback, each TA was then given two more assignments to grade. As before, these assignments were entered into a spreadsheet, which compared the TAs’ scores to baselines and personalized feedback was given for each assignment. After these two rounds of grading, any TAs that were identified as still grading “too harshly” or “too leniently” were required to attend an additional follow-up session. This session guided the TAs through the grading of one of the previously seen training assignments with the goal of clarifying any remaining issues, questions, or misconceptions concerning the grading of technical writing via an interactive, in-person group session.

compared to both Year 0 and Year 1. This may indicate that our expanded grading training program has improved TA understanding of rubrics and improved their ability to identify and respond to student mistakes.

The qualitative results from the new program were collected by conducting TA focus groups. In these sessions, TAs were asked to comment on what went well, what could be improved, what was most useful, and what other topics or resources that should be added in the future. From the feedback that was gathered at these focus group sessions, several themes emerged. These themes were gathered and framed into “Tricks of the Trade” with the collected statements intended to serve as recommendations and helpful suggestions to other programs that may be interested in employing a similar training program at their institutions [10]. Some examples of these include that the TAs liked being compared to a standard or baseline grade to help them calibrate their own grading and that it was important to evaluate when this training would occur based on your university’s academic schedule so as not to overburden TAs with the training tasks. Additionally, the focus groups indicated their desire to receive timely feedback. Noting that providing this feedback to the TAs was a time intensive process for the lead TAs, some changes were needed. One change that has the potential to provide immediate real-time feedback for the TAs when completing training was the development of an online collection tool of the grading training results that provides automated feedback. Details of the proposed system are included in the following section.

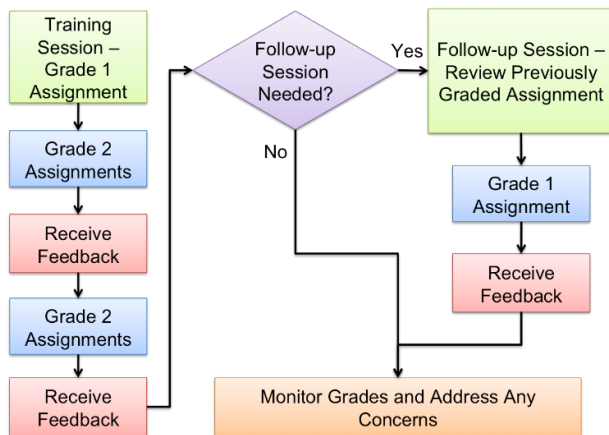


FIGURE 1
FLOWCHART OF THE GRADING TRAINING PROCESS

II. Initial Results of New Training Program

The initial impact of the newly expanded training program for grading of technical writing was assessed via both quantitative and qualitative methods [10]. A quantitative analysis covering a three year period (Year 0 – before instituting new training, Year 1 – pilot training program, Year 2 – current training implementation) examined two technical writing assignments that were unchanged over this time – one lab report and one lab memo. For both writing assignments, this initial analysis showed a decrease in the standard deviation of grades across the FYEP for Year 2

PLANNED TOOL FOR THE FUTURE

I. Key Elements of the Tool

The two most important elements of the grading training tool are the ease of use for the TAs and the ability to provide automated feedback. Our TAs have many responsibilities including grading, training, in-class time, and outside the classroom projects [11]. Therefore, it is important that the process for this training be easy and take minimal time to learn and use.

In order to achieve the ease of use, it will be important to use a platform familiar to the TAs. Also, the tool should be automated to provide specialized numerical feedback as well as additional feedback comments when appropriate. For example if a score is chosen within the acceptable range, the following feedback could be provided: “Your score for the Introduction is within the acceptable range (XX-YY)”.

One of the grading issues that commonly occurs is not following the rubric and giving grade scores in between the allowed standard values. The automated feedback could be another opportunity to stress following the rubric standard scoring. Therefore, feedback for this could be “Your score of X is not a valid choice for this section. Please remember to only choose the scores that are provided on the rubric. Following the rubric allows us to standardize our grades.” Providing this feedback instantly will allow the connection to be made back to the work that was just completed. Also

the feedback will appear as they submit the quiz so there will be no need for them to remember to go obtain the feedback or read an email containing the specific feedback. Additionally, the automated feedback will limit the amount of time required by the lead TAs and faculty in recording the scores and providing the feedback.

II. Implementation of the Tool

To address the key elements noted above, the learning management system for the university, Carmen, will be used to implement the new tool. This learning management system has a wide range of abilities but the “quiz” feature will be used to collect the grading training data. The quiz allows for feedback to be provided based on what answer is chosen for an individual question. This will allow the quiz attempt to provide immediate feedback as soon as it is submitted.

Additionally, grade points on the quiz can be used to determine which TAs need to attend additional training sessions. Those that are below a certain value can be flagged as those that are grading “too leniently” and those that are above a certain value will be flagged as those grading “too harshly.” This is in contrast to the previous method where a lead TA or faculty member recorded all the scores into a spreadsheet and then determined if the scores were “too harsh” or “too lenient”.

III. Potential Shortcomings of the Tool

Part of the grading training included examining the level of comments provided to the student on the training documents. At this time, this step cannot be automated; however, this non-automated feedback can still be delivered within the same learning management system. A dropbox can be used to collect the graded documents and then feedback can be entered directly into the learning management system. This will allow all the feedback to be centrally located. This will make it easier for TAs to see their results, as well as allow the instructional staff to review the training materials and understand the strengths and weaknesses in TA grading. Because we operate in instructional teams throughout the semester with one faculty member, a GTA, and a few UTAs on a team, it is important that the instructional staff can see the results of the TAs working with them. This will allow all the results to be centrally located and available for all faculty to view.

FUTURE ASSESSMENT AND RESEARCH

To assess the impact of the updated automatic grading training system, we developed and will implement a survey that was created based on Suskie’s five criteria for good assessments [12]. Suskie describes good assessment as:

- Concentration on and coming from clear and important objectives.
- Cost effective in terms of time and money.
- Producing accurate and truthful results.

- Utilized.
- Valued.

We used the final four items (cost, results, utilized, and valued) to develop a set of survey questions that will be given for the old grading system training and the new grading training system to assess their impact. Comparing the old results to the new results, we will be able to determine whether or not the automated grading training system is a better assessment. We chose not to assess the first item, but the overall objectives for the old system and the new system are the same. For each item, we developed three assessment questions to allow us to run reliability testing and create a composite construct of each item. The assessment questions are provided below.

- Cost Effective
 1. Too many resources are needed for the technical writing grading training. [Reverse]
 2. The technical writing grading training took away needed time from the other training elements. [Reverse]
 3. I would have liked to spend more time completing the technical writing grading training.
- Truthful and Accurate Results
 1. The technical writing grading training was similar to grading actual student assignments.
 2. The technical writing grading training allowed me to normalize my grading to other TAs.
 3. I believe the technical writing grading training resulted in an accurate picture of a grading.
- Utilized
 1. When grading throughout the year, I thought back or referred to the technical writing grading training.
 2. I found the technical writing grading training to be useful as a TA.
 3. After completing the technical writing grading training, I completely forgot about completing the activity. [Reverse]
- Valued
 1. In my opinion, the technical writing grading training was an important component of my learning as a TA.
 2. We should complete some form of the technical writing grading training each year.
 3. I see the value in completing the technical writing grading training.

TAs from all programs that use some version of the grading training in both the old and new forms will be asked to complete the survey. For each grading training system (i.e. each year), this will include approximately 200 TAs, consisting of both GTAs and UTAs. We plan to compare the results for the various groups to determine the best way to train our TAs for grading technical writing based on the data we collect. By collecting this type of information, we are able to continue the research to practice cycle as it relates to this project [8].

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AUTHOR INFORMATION

Krista M. Kecskemety Senior Lecturer, Engineering Education Innovation Center, The Ohio State University, Kecskemety.1@osu.edu

Andrew H. Theiss Graduate Teaching Assistant, Engineering Education Innovation Center, The Ohio State University, Theiss.19@osu.edu

Rachel L. Kajfez Assistant Professor of Practice, Civil Engineering, Engineering Education Innovation Center, The Ohio State University, Kajfez.2@osu.edu