

2006-1729: PRACTICAL WRITING EXERCISES IN CONSTRUCTION MANAGEMENT

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Practical Writing Exercises in Construction Management

Abstract

The University requires that at least two core courses in any academic program within the system be writing intensive. Under a writing intensive program, students write about assigned topics that are discipline specific as would be created in professional situations within their respective fields. Writing exercises are evaluated on both technical content and proper writing standards. This combination of technical and applied writing standards assists students in learning to apply better communication standards for technical presentations.

In Construction Management, practicing professionals must respond to a variety of situations that range from technical interpretation to public meetings. The Construction Management Technology (CMT) program at the University adopted writing intensive standards within CET 356 Construction Documentation and Administration. In CET 356, students write and revise formal business letters, memos, meeting minutes, and field notes through a series of class exercises based on an ongoing project.

Exercises are evaluated through an assessment matrix. First draft assessments are returned for student review and are resubmitted in a final form for grading. The information from the two stage evaluation is reviewed to assess improvement in the individual student.

Writing intensive requirements have been applied through two semesters over two academic years. Results reflect the writing assessments of two graduating classes. Student writing skills seem to improve with assessment feedback.

Background

In addition to the traditional English grammar and writing courses that students normally take, the University requires all students to take two writing intensive courses within their respective discipline of study. Under the University's guideline for writing intensive curriculum, courses within a specific discipline that are designated as writing intensive are structured to include writing exercises that are relevant within the specific discipline. Students prepare the written assignment assigned by the instructor who, in turn, reviews it for both technical content and appropriate composition. The student is then allowed to revise the assignment based on the instructor's review comments and to resubmit the assignment for a final grade. The purpose of these writing intensive courses is to give students better practice communicating discipline oriented concepts in appropriate professional formats.

Two courses within the Construction Management Technology Program (CMT) in the School of Engineering Technology are designated as writing intensive. These courses are CET 356 Construction Documentation and Administration and CET 451 Construction Law. CMT

professors who teach these courses create, assign, and evaluate the practical written exercises for both technical content and adequate composition. This paper describes the development and evaluation of exercises used for CET 356 in the 2004 and 2005 academic years.

Assignments

In CET 356, students review a multitude of documents and administrative strategies that are required to effectively manage a modern construction project. Many of these documents are standard forms that are required through legal and regulatory authorities. Construction managers need to be familiar with these documents and be able to properly administer them in order to maintain the permanent project record for the owner, engineer, contractor, and regulatory agencies.

All of the programs within the School of Engineering Technology are assisted through an Industrial Advisory Committee (IAC). These IACs are boards of practicing professionals within a specific discipline who advise programs as to what is important for professional practice. In 2003, the CMT program's IAC identified four types of written documents to incorporate into CET 356: the formal business letter, memos, meeting minutes, and field notes. In the CMT program, an ongoing case history for an on-campus building is introduced to the freshmen class through plans and specifications. This case history is used throughout the curriculum in several of the discipline courses. This project is the Advanced Manufacturing Center (AMC) that includes a combination of office space and open shop area. Using this case history, four assignments were given to the students. During the 2004 academic year, two formal business letters and field notes were assigned based on class scenarios. During the 2005 academic year, the assignments were revised and one formal business letter, a set of business memos, a set of meeting minutes, and field notes were assigned. These applied writing exercises provided students with experiences that go beyond a standard technical writing course.

Assignment One.

The first writing assignment required the individual student to take the role of an owner's representative and convey to the contractor that substandard work was observed. Upon inspection of the building that is under construction, the owner's representative notices that certain materials were not used and not installed properly in the construction. Specifically, water resistant drywall was installed and the seams were inadequately finished. Additionally, the representative learned that someone on the contractor's staff authorized the changes. These changes are completed without an official change order. The assignment laid out the premise of the problems and directed the student to write a formal letter to convey the issues. Not directly implied within the assignment was what the final resolution to the situation would be.

Students were provided with common guidelines for the standard components of a formal business letter including items such as editorial marks, headings, and closings. Sample letters are provided. A rubric was created that provided both a qualitative and quantitative assessment to the individual's work. Quality traits that were assessed include grammar, punctuation, style, tone, content, resolution to situation, mechanics of presentation, wrong drywall, bad finishing, and authority. Each of these qualities was rated on a scale of 1 to 10 with 1 being the lowest and

10 being the highest. The final assessed points for each of the traits was added and a numerical grade was then assigned to the student. (Exhibit 1 in the appendix)

The instructor established minimum evaluation criteria to evaluate the formal letter using each of the equality traits in the rubric. The rubric allowed the instructor latitude to judge the quality of the assignment using both subjective and absolute criteria (2). The rubric illustrated the importance of having a resolution to the issues raised in the letter and gauged the identification of the three major concerns: improper materials, bad drywall seams, and authorization. Table 1 shows the range of evaluation criteria used to evaluate the assignment for each student in the class.

Table 1-Evaluation Criteria for the Formal Business Letter

Trait	Low Points (1-5)	High Points (6-10)
Grammar	Improper tense, spelling (3> spelled incorrectly)	Consistent noun/verb agreement, readability
Punctuation	Lack of commas and periods, run-on sentences	Proper use of colons, lists, and capitalization
Style	Unclear thoughts	Smooth reading and clear
Tone	Sarcasm, passive tense	Positive positioning
Content	Missing concerns	Includes relevant points
Resolution to Situation	Doesn't address problems	Leads to agreement
Mechanics of Presentation	Missing structure provided	Contains guideline material
Wrong Drywall	Not Identified	Identified
Bad finish	Not Identified	Identified
Authority	Not mentioned	Mentioned

Students submitted the assignments and the instructor read and reviewed the submitted work. The instructor then returned the assignments to the students with marked comments and suggested improvements. The students revised the assignments and resubmitted them to the instructor for final grading. He read the revised documents twice. In the first reading, the instructor read the individual assignment to form an overall reaction. He then read it for specific content and composition. Using the rubric, the instructor evaluated the assignment and gave the individual student a grade for the assignment.

After observing two separate classes of students who have the written formal letter assignments in CET 356, several common problems were noted within the first submittal drafts:

1. Writing styles were weak. The students tend to provide illogical sequences for ideas conveyed in the letter.
2. Tone is sarcastic. Many student use passive voice and imperative sentence structures. These combinations can be abrupt for the reader.
3. The content and three problem areas are not all identified. Even though the assignment spelled out the problems, many individuals tended to leave out at least one of the major points.
4. No resolutions are identified. The letters don't force a meeting or decision as to what should be done for corrective actions.

Generally speaking, student punctuation and spelling was good. Many students clearly spelled out the concern about authority and direct the contractor to go through the owner's representative. Second submittal letters tended to correct many of the noted problems from the draft. However, students do tend to forget detail and may leave out one of the concerns from the inspection.

Assignment Two

The second assignment forced students to take the minutes of a construction business meeting. Through a grant from the Center for Teaching Excellence at our University, a video of a construction meeting was filmed and shown in class. Theater student actors acted out a construction meeting between the contractor and owner representatives. The items that were covered in the formal letter were used as the premise of the extemporaneous performance. In the meeting, the actors articulated the problems with the drywall and questioned the authority of changes as had been pointed out under the first assignment with the formal letter. Additional information was provided about typos and work with the ventilation system within the building mezzanine. The video lasted for 10 minutes and followed a logical sequence as within standard business meetings: call to order, review of previous minutes, upcoming work items, new business, and action items. CET students were given a copy of minutes with the attachments for an actual past meeting on another University project. With the class, the instructor discussed some of the techniques that he uses in taking minutes. The video actors were identified such that students could distinguish who the attendees of the meeting were. The instructor provided the actors with a loose script that included a few extraneous items such as late meeting attendees, "shouting," and inappropriate references toward a couple of the meeting attendees.

Students viewed the videotape and took meeting minutes from what they observed. The instructor created a rubric that assessed quality traits through a scale as done under assignment 1. Like assignment 1, final assessed points for each of the traits were added and a numerical grade was then assigned to the student. The quality traits that were assessed included attendees, dates and location, logical order, discussion detail, presentation, grammar and spelling, summarization of points, and discussion points of the drywall, seam finish and range hood installation. (Exhibit 2 in the appendix)

As with assignment 1, the instructor established minimum evaluation criteria to evaluate the meeting minutes using each of the equality traits in the rubric. The rubric allowed the instructor latitude to judge the quality of the assignment using both subjective and absolute criteria (2). The rubric illustrated the importance of keeping details straight and recognizing who agreed to what items within the discussion. Table 2 shows the range of evaluation criteria used to evaluate the assignment.

Table 2 – Evaluation Criteria for the Minutes of a Meeting

Rated Areas	Low Points (1-5)	High Points (6-10)
Attendees	No listing or incomplete list of who was present	Listing with all participants (Name spelling was not considered)
Dates, Location, Time	No reference to the items or two missing	Reference to items or only one missing
Logical Order	Did not follow order of meeting	Followed meeting order
Details of Discussion	No reference to resolution to discussion item	Reference to resolution and who discussed
Presentation	Did not flow well and was incoherent. No logical sequence	Good visual presentation, able to follow
Grammar, Spelling, Etc.	Bad spelling and grammar (3> mistakes)	Proper use of spelling and grammar
Summarization of Points	No list of Action items	Action items listed
Drywall	Not referenced	Referenced
Seams	Not referenced	Referenced
Range Hood	Not referenced	Referenced

The range hood that was discussed in the meeting was an item not shown on the project plans. When discussed in the meeting, the owner needed to issue a change order.

Only the 2005 class completed this exercise. Several problems were noted:

1. Students incorrectly noted items that were discussed as corrections in the previous meeting minutes as new action items discussed during the meeting.
2. Students did not identify who agreed to various points within the discussion.
3. Students incorrectly noted that the change order was due to the contractor missing information that was on the plans. In fact, the hood was not on the plans and was intended. The owner was in error.
4. Students did not record action items.
5. Students did not include time information.

Even after a second draft of the minutes was generated, several students still incorrectly reported information. It was noted that students did not record the extraneous items thrown into the meeting that included a late attendee, a confrontational exchange between the construction company owner and his employee, and a direct remark made between a construction company employee and one of the owner's representatives. These extraneous items should not be noted in the minutes.

Assignment Three

In the third assignment, students took the role of the owner of the construction company who had attended the business meeting and wrote a series of three memos. Because email is prevalent in modern business practice, many companies do not tend to use paper memos. Since email is a memo form, the exercise was done in paper memo with recognition that such information would have been done through email. As result of the construction meeting with the client, the construction company owner recognized the need to write three memos: one to the owner to confirm details that he had agreed to do, one to his employee who admitted to authorizing work without proper authority, and one to his onsite representative to direct removal of the drywall. These memos represent major correspondences that one may have to do in the workplace: to the client regarding the project, to an employee reprimanding for actions, and to the staff directing work actions. To do this assignment, students were provided with general information about writing memos and were given example memos.

A rubric was created for the exercise to assess quality traits of grammar, punctuation, style, tone, content, resolution to situation, mechanics of presentation, University memo, Superintendent memo, and Employee memo. (Exhibit 3 in the Appendix)

The rubric assessment as shown in table 3 was used with the additional criteria of the three types of memo. These three memos were assessed as follows:

Table 3-Evaluation Criteria for Memos

Trait	Low Points (1-5)	High Points (6-10)
Grammar	Improper tense, spelling (3> spelled incorrectly)	Consistent noun/verb agreement, readability
Punctuation	Lack of commas and periods, run-on sentences	Proper use of colons, lists, and capitalization
Style	Unclear thoughts	Smooth reading and clear
Tone	Sarcasm, passive tense	Positive positioning
Content	Missing concerns	Includes relevant points
Resolution to Situation	Doesn't address problems	Leads to agreement
Mechanics of Presentation	Missing structure provided	Contains guideline material
University Memo	Did not include all of the agreed points	Included all of the agreed points
Superintendent Memo	Did not direct change of work	Directed work changes
Employee Memo	Threatened firing and disciplinary actions	Reprimanded

Only the 2005 class completed this exercise after having viewed the video about the construction meeting. Student memos were generally good with some identified problem areas:

1. The overall grammar and punctuation needed improvements. Many write as they would in an informal email.

2. Memos to specific parties were too general and did not convey the message as should be intended. Many memos did not direct the superintendent to repair work. Many did not properly reprimand the employee.

After second drafts, several students improved their memos to the respective parties. The memo to the superintendent was clearer as to how the corrective work would be done in the field.

Assignment Four

The last assignment in the course placed the student as a site inspector taking field notes. A video tape of pile driving operations at an active construction site similar to the work that is possible in a commercial building site was shown to the class. Students watched the half hour video and took notes of their observations of the construction site. Students were provided with supporting documentation that described some of the pile driving results. The instructor provided copies of suggested field note formats and discussed the importance of thorough observations. For the assignment, the students needed to put together a clear set of notes documenting the work shown in the video. A qualitative rubric for this assignment was created that assigned quality traits of who, what, where, equipment, weather, measurement, mechanics of presentation, clarity, details, and time. (Exhibit 4 in the Appendix)

As with the other three assignments, the quality traits were assessed through a rubric as depicted in the following table:

Table 4- Evaluation Criteria for Field Notes

Trait	Low Points (1 to 5)	High Points (6 to 10)
Who	Lack of Contractor ID	Contractor ID
What	Lack of major site action	Incorporates site activity
Where	Lack of orientation	Specifies locations
Equipment	Doesn't state what is onsite	Lists equipment
Weather	Doesn't mention	States weather conditions
Measurement	Doesn't measure in place items	Records measurements
Mechanics of Presentation	Improper format	Proper format
Clarity	Hard to follow	Easily followed
Details	Leaves out facts	Incorporates site information
Time	Leaves out times	Includes times for events

Both the 2004 and 2005 classes completed the assignment. Generally speaking, several areas were not reported well:

1. The contractors were not clearly identified as to who was doing what. Two contractors were working on the site and each was doing specific tasks.
2. The location of activities was not consistently reported.
3. Onsite equipment along with personnel was not recorded accurately.
4. Measurements were not recorded. (measurement information had been provided.)
5. Time and details were not recorded with any great accuracy.

The student notes did include weather observations and generally followed a logical order. Second draft notes lacked detail and only reported back facts as presented through the corrections suggested by the instructor.

Conclusion

Realistic exercises help provide students with practical applications to help develop written communications skills. Formal business letters and memos illustrate how to apply technical writing to the situations of construction management. Meeting minutes and field notes illustrate the importance of observation and conveying accurate records of these observations. These exercises helped students understand the importance of written communications as applied to construction management.

Rubrics provide effective evaluation tools for both the student and instructor. Through rubric measurement, the student can see how a grade was assigned and the instructor can maintain consistent evaluation criteria in correcting several student assignments. Rubric evaluation allows the instructor greater flexibility in grading assignments. Quality point assignments help differentiate subtle differences in individual student performance and give instructors a uniform method of evaluation. Second draft assignments are generally improved after instructor feedback. Student assignments tend to improve as the semester progresses.

Bibliography

1. Schnieter, R. Wane. 2004. Writing and Undergraduate Engineers-A Continuing Problem. *Proceedings of the 2003 ASEE Annual Convention and Exposition, Nashville, Tennessee, Session 0000.*
2. Dunn, Philip A. 2005. Using Writing Intensive Exercises in the Classroom. *Proceedings of the 2005 ASEE New England Section Annual Conference, Fairfield, Connecticut, Session 2B.*
3. Dyrud, Marilyn A. 1997. Attitudinal Aspects of Assessing Student Writing. *Proceedings of the 1997 ASEE Annual Convention and Exposition, Milwaukee, Wisconsin, Session 2647.*
4. Fulwiler, Toby and Young, Art. Programs that work: Models and Methods for Writing Across the Curriculum. Boynton/Cook Publishers, Portsmouth, NH, 1.

Exhibit 1

Review of Formal Business

Name _____

1 to 10, highest

Criteria for Evaluation	1	2	3	4	5	6	7	8	9	10	Total
Grammar											
Punctuation											
Style											
Tone											
Content											
Resolution to Situation											
Mechanics of Presentation											
Wrong Drywall											
Bad Finish											
Authority											

Total _____

Comments:

Exhibit 2

Minutes of a Meeting

CET 356

Name _____

Rating Areas	1	2	3	4	5	6	7	8	9	10	Total
Attendees											
Dates, Location, Time											
Logical Order											
Details of Discussion											
Presentation											
Grammar, Spelling, Etc.											
Summarization of Points											
Drywall											
Seams											
Range Hoods											
Total											

Exhibit 3

Review of Business Memos

Name _____	1 to 10, 10 highest										
Criteria for Evaluation	1	2	3	4	5	6	7	8	9	10	Total
Grammar											
Punctuation											
Style											
Tone											
Content											
Resolution to Situation											
Mechanics of Presentation											
University Memo											
Superintendent Memo											
Employee Memo											

Total _____

Comments:

Exhibit 4

Review of Field Notes

Name _____ 1 to 10, 10 highest

Criteria for Evaluation	1	2	3	4	5	6	7	8	9	10	Total
Who											
What											
Where											
Equipment											
Weather											
Measurement											
Mechanics of Presentation											
Clarity											
Details											
Time											

Total _____

Comments: