

Writing Assists Learning

Learning Improvements in Teaching Construction Management

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Abstract

This paper sets out to address the “**thesis**” that there is a correlation between writing in an academic discipline and mastering its material, shaping its ideas, and critical thinking. When a student writes he learns the subject better, he understands the material better, and he retains course material longer. It will set out two Case Studies in the Construction Management field presently being used at Farmingdale State University and how they differ in nature and therefore produce different writing skills. We will address the success and failure of each of these styles of assignment and try to answer the question “why” one assignment may produce better writing than another. The relationship between “writing” and “thinking” will be explored particularly from the standpoint of improvements made to student’s writing skills as a result of the techniques applied. Various learning improvements and techniques will be explored such as the inseparability of writing and thinking, the student’s need of a format to adhere to, and the better packaging of assignments. Can a student’s ability to write be “trained” by starting with low stakes writing and building up to high stakes writing in the time span of one semester. How much does “peer review” influence the student’s writing. Additional areas of interest would be the effects of requiring an oral presentation and/or defense on the writing ability of the student, and the pros and cons of keeping a journal.

Introduction

Few faculty members would deny the importance of writing in their academic discipline or the role writing plays in mastering material, shaping ideas, and developing critical thinking skills. Writing helps students learn the subject matter: “they understand and retain course material much better when they write about it.”³

Farmingdale State University, along with most other universities, has embarked on a program of feedback from the very people and institutions that hire our graduates. There is nothing new about this for it has always been the desire of universities to prepare their students for the world in which they must eventually operate. Whether going from graduation to work or an advanced degree program, some attributes simply must be there. Farmingdale State University has set up a program to ascertain feedback from those who see our graduates next. In the Architecture & Construction Management Department, an Industrial Advisory Committee has been established and meets two to four times per year. The committee consists of the faculty members who teach the courses and members of the professions to which we send our graduates. Architects, Engineers, Construction Managers, et al are members and regularly attend our meetings, giving feedback as to precisely what the working profession wants our graduates to be able to do and do well.

The number one attribute desired and even required is that our students graduate as good communicators; particularly, good writers. Top executives of Long Island's biggest companies attend in order to share their knowledge. They are clear; successful executives are good communicators. Their observations about our program are always that our graduates are technically excellent, but need to be better skilled in the art of communication. They need to graduate with better written and oral communication skills.

The faculty of this university has long felt that our students need writing practice beyond the standard English courses. Students must be proficient in low stake and high stake writing. Some courses are perfectly arranged to do just this. Engineering courses that require a written laboratory report each week are a perfect example of a course where low stakes writing is practiced week after week. Most graduates will be called upon to write a report of some kind in their first year after graduation. Those who have been tutored in this skill will have an advantage over those who were not. Oral communications are equally essential, and more and more this is being interjected into the curriculum. It is understood that each curriculum has a plethora of work to cover therefore time and effort to add writing and oral communications is hard to come by. However, it is also recognized that effective communication is the fuel that makes the business world run. We needed to find room for this and we have begun to do so.

At the same time, the Accreditation Board for Engineering and Technology (ABET) has clearly placed both written and oral communication at the top of their priority list for graduates. Effective communication is one of the required program outcomes and as such is measured and hopefully improved every semester, thus, the University's "Writing in the Disciplines" program. This paper describes the improvements in learning as a result of this program by examining two case studies.

Case Study “A”

The following assignment was given in a senior level class in Construction Management and CPM Scheduling. It is significant to point out that this is a research paper writing assignment given to seniors in the fall semester of their final year. It is also a precursor to an oral presentation and defense of the paper. This is a very practical Construction Management course and the student's enthusiasm is generally high.

CONSTRUCTION MANAGEMENT AND SCHEDULING Research Paper Writing Assignment

The main writing assignment is a ten to fifteen page Research Paper on a selected subject in the field of Construction Management (CM) and CPM Scheduling. Topics are randomly assigned. Some examples of topics are as follows:

1. Construction Contracts
2. Construction Law
3. Controls, Time & Money
4. Total Safety Management; OSHA
5. Bonding & the Surety Company
6. Bid Strategy and Award
7. CM in City Planning
8. Labor Unions and Industrial Relations
9. Improving Construction Productivity
10. CM and the Environment (EPA)
11. Claims; cost, arbitration & resolution
12. International Building

The assignment is for a team of three to four persons to write a research paper about their subject and “tell me something new” about the subject. The paper is type written, double spaced with footnotes and bibliography (MLA or APA style). This requires both library and internet research. The team is encouraged to find “new” material on the internet even if it must be later de-bunked in their analysis section.

The assignment is given to the team in week two and an outline is expected in week six to be approximately one to two pages showing the breakdown of the subject and showing an understanding of construction management as applied to a real situation. Anecdotal information is only tolerated as it directly pertains to Construction Management and the situation at hand. The students will have approximately four weeks to generate the first draft, at about week ten, which will be reviewed for its technical merits and for its appropriate level of writing skills. This will be marked and returned to the students with "red" marks that must be addressed on both the

technical and writing levels. At this stage the students will be given “constructive criticism” about their personal writing skills and writing style. At least two drafts are required. Since this is a team effort, some students write better than others and the lack of blending in style shows in the first draft. The students will then re-submit the final paper in week fourteen of the semester to be marked and graded. A second draft may be required if the level of writing skill is insufficient for a fourth year level course.

Case Study “B”

The second assignment was given in a senior level class in Construction Cost Analysis and Advanced Estimating. This class is more quantitative and spends much more time on problem solving but improved writing is part of the course. This is a research paper writing assignment given to seniors in the spring semester of their final year just before they graduate. An oral presentation and defense of the paper is not part of this assignment. Students in this class may be suffering from “senior-itis”.

CONSTRUCTION COST ANALYSIS & ADVANCED ESTIMATING Research Paper Writing Assignment

The main writing assignment is a five to ten page minimum Research Paper on a selected subject in the field of Construction Cost Analysis & Advanced Estimating. Topics are randomly assigned. Some examples of topics are as follows:

1. The Estimating Cycle
2. Estimating Data
3. Accounting, Depreciation & Overhead
4. Variation Factors
5. Elemental Analysis
6. Engineering Economy
7. Unit Price vs. Detail Estimating
8. Bid Strategies
9. Life Cycle Costs
10. Benefit / Cost Ratios

The assignment is for a team of three to four persons to write a research paper about their subject after keeping a term-long journal. Some time is spent describing a journal and how to keep one. This is assigned early in the semester and meant to be a full term commitment. The paper is type written, double spaced with bibliography (MLA or APA style). This requires library and internet research and personal interviews. Some time is devoted to personal interview styles but most interviews are kept informal. The team is encouraged to find “new” material on the internet even if it must be later de-bunked in their analysis section.

The assignment is given to the team in week two and the outline is expected in week five to be approximately one to two pages showing the breakdown of the subject and showing an understanding of the topic as applied to a real life situation. Anecdotal information is only tolerated as it directly pertains to the topic. The team is expected to do library and internet research along with personal interviews and keep their notes in a journal which will be periodically checked. The students will then have approximately four weeks to generate the first draft, at about week ten, which will be reviewed for its technical merits and for its appropriate level of writing skills. This will be marked and returned to the students with "red" marks that must be addressed on both the technical and writing levels. The students will then re-submit the final paper in week fourteen of the semester to be marked and graded. A second draft may be required if the level of writing skill is insufficient for a fourth year level course.

Success and Failure and why

Both assignments were successful in that the quality of papers received were substantially superior to those of previous years. Every year the assignment is refined. Having said that, Case Study "A" was a bigger success than Case Study "B". I believe this is not entirely a result of the student's energy or writing skills but also a result of the framing of the assignment. This was not a direct head-to-head comparison as these were not necessarily the same students in each test population. That being said, the first assignment had the added requirement of an oral presentation and defense while Case "B" did not. The students in the spring case (study B) may have been less motivated by their close proximity to graduation day. A major difference between the two studies is that Case Study "A" had a required minimum of two drafts while Case Study "B" had "drafts as deemed required". Some students submitted one or even no drafts. Finally, I believe some of the energy in Case Study "B" was diverted to the journal which then did not translate into a better paper. The students gathered material in their journal folder but did not use it in the paper as prodigiously as had been expected. Some treated the journal almost as a separate assignment.

Writing and Thinking

Students in the School of Engineering Technology are quite familiar with the tools used for communicating their designs to a client. They are comfortable with engineering drawings and calculations to convey their design to someone else. They are learning today that they must respond to a different audience and this requires a different communication skill. This skill is not a new one but an old one, writing and writing well. Students are learning that "writing is thinking on paper"¹. They are learning that their thinking is enhanced by their writing because they learn to adopt conventions of format and structure and they begin to understand the expectation of their peers and clients. In fact, Peer Review, discussed later in this paper, has great impact on the students.

First and foremost, students must accept that writing does not stand alone. It is intimately related to learning, thinking and communicating. It is not just words on a page but instead ideas on a page that must flow with logic and structure to be read by their audience as such. When the student begins to be a “free” writer, that is unhindered by self imposed restrictions about what is “good” (writing, content, style) and what is not, he will find means to integrate his ideas with the ideas of others in a harmonious manner. He will understand the relationship between language and knowledge, and know that good writing requires formulating language and knowledge into a palatable package for the reader’s enjoyment and use. The student writing a research paper must be able to summarize another’s position and concisely express his own position. He must think through the process of generating, revising, editing and proof reading only after his initial thoughts are on paper. It is not surprising that some students say they “put it all down at once” and then revamp it later. There are collaborative aspects and social aspects of writing best left for another paper, but suffice to say that your paper is written for a purpose and its reader must be able to easily ascertain that purpose. Specialized vocabulary should and must be used to clearly express the technical ideas these students are researching but must be used appropriately. A good writer is at least collaborating with himself. He must learn to be “intelligently critical, detached, and tolerant.....while at the same time, be sensitive, enthusiastic and partisan...”⁴

Finally, the writer must make use of multiple drafts in order to refine his thinking and word usage. This is not a “re-dream of your topic” but instead a “refinement of your topic”.

Learning Improvements

The application of the principles learned in the Writing in the Disciplines (WID) program have changed our perception of how our students think. As stated above, thinking and writing appear to be inseparable. In fact, good organization in writing seems to correlate with clear thinking about the subject at hand.

The first learning improvement made should be to provide the student with a basic format to get started. “Most writers, either consciously or not, follow a standard writing plan”². A plan should be outlined for new students. For example; a different format is required to write a research paper as compared to writing a laboratory report. A brief standard ten point writing plan follows:

- Decide what to write about. (the assignment)
- What is its purpose. (why write it; not just for a grade)
- Decide for whom you are writing. (the instructor now but the client later)
- List ideas, assertions, facts and illustrations.
- Pick a sensible organization style.
- Re-sort your ideas in your outline. (this may be the most important part)

Find an illustration, anecdote, or example to open with.
Write, write, write.
In the first draft, polish words, sentences and paragraphs.
Put it aside, then come back and edit.

For the instructor, the foremost improvement in the students writing seems to be a direct product of better packaged and thought-out writing assignments by the professor. Writing assignments must be varied, clear and have boundaries such that the student doesn't "wonder off into the broccoli patch". The student seems to need interspersed constructive criticism. By that I mean, that they need a draft to be read, critiqued (sometimes by their peers) and constructive help given. Some students lose all sight of the topic even though they made a plan. Also, plagiarism is kept to a minimum this way. Students often don't know the difference between plagiarism and research.

Student writing improved when the writing assignment was changed to include an oral presentation that included defense of their work. Knowing the paper will have to be presented face-to-face and then defended seemed to greatly enhance the paper. The requirement of an overhead slide or Power Point presentation forced the students to organize and package their work better.

One teaching tool was to require a full term commitment from the student to keep a journal of the research. The journal was to be a folder which included copies of library research, internet research and personal interviews. The jury is still out on the success of this arrangement toward improving the student's paper. Although each student kept a journal, there seems to be no evidence that it was used to enhance the written paper. In fact, it seemed to decrease the orderliness and logical organization of the work. It seemed to have been treated as a separate assignment.

Student's writing skills improve when their writing is a series of assignments. These assignments should start as "low stakes" assignments such as a brief synopsis of a subject already covered so they already know the material. Little or no research is required so the student can concentrate on writing skills. The student should concentrate on developing his ideas through creative writing skills. Then, the assignments should culminate with a "high Stakes" writing assignment which should require research skills as well as technical writing skills. "This progression should remind students that writing is a process that helps us clarify ideas." ³

Peer Review

Perhaps writing should be thought of as a social form of thinking at the college level. Students seem to see high school as "social over scholastic" and bring some of that thinking to college.

Perhaps the professor can use this by using peer review. The students are actually harder on one another than expected. Students seem to learn very well from one another. At the same time, professors learn well from the students.

Peer review may hold many answers to teaching students that writing sharpens your thinking. Writing is a critical form of thinking. Writing well is usually the result of a well thought out plan and your peers will “call you on it”. Good plans, like good writing, have rules, structure and standards of quality. The concept of peer review may set higher standards of quality than we teachers dare. Students are very susceptible to peer criticism.

Students learn an additional lesson by critiquing one another’s work. They learn to understand how this paper was built in stages, and that they are reviewing a work-in-progress. They must first agree they are looking at the appropriate format for this type of work. This often leads to a discussion of the appropriate format and organization. I have found that peer review contributes to things such as genre conventions, paragraphing, tone and mechanics. Sometimes reading the paper of a fellow classmate teaches a student the rules of syntax, grammar, punctuation and spelling. Usually, classmate review operates best when the students are provided with a model and a series of questions to be kept in mind during their review. Also, students must be required to write a one page critique expressing what they see in the other fellow’s paper and why it is acceptable or not.

Finally, when time permits, reading aloud of papers followed by an informal discussion can be very enlightening. The teacher should review the peer reviewer so that it is understood that reviewing someone’s paper is meant to teach the reviewer as well as the reviewed. Students must develop as a life long learning skill the ability to think, write, review and comment all in a seamless motion.

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