THE IMPORTANCE OF TECHNICAL WRITING SKILLS

FOR ENGINEERING STUDENTS

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ABSTRACT

Technology has permeated every aspect of our life. It is felt more so in the field of education. In an engineering college the students are involved in learning every face of technology. But their learning must be expressed both verbally and in writing for them to succeed academically and professionally.

Writings that deal with science or technology subjects are scientific or technical writings. Practice for such kind of writings is to be given to the technical students who study engineering and technology. But unfortunately this has become a challenge for the English teacher with the limited confines of a curriculum.

Engineering education can be defined as training for the practical applications of science in industry and commerce. Technical communication is very important for practical applications of science and for learning the mechanics in technology. The students are expected to be familiar with various modes of technical communication like business correspondence, technical report writing, proposal writing, thesis writing, scientific article writing etc.

But how equipped are the engineering students in technical writing? Do they have the ability to express their findings through scientific writing? My paper deals with the importance of technical writing, features of technical writing and the challenges the students face in written communication.

KEYWORDS: Jargon, Process Writing, Scaffolding, Scientific Writing, Technical Writing

INTRODUCTION

Technical communication is very important for practical applications of science. The engineering students need to master writing skills in order to give expression to their findings, research and applications.

The primary training and interests of engineering students lie in technical areas. Most of the engineering students successfully pursue their technical subjects but without extra writing courses. After their studies, being practicing engineers and scientists in government and industry, they work on technical projects. Scientists and engineers may be technically brilliant and creative, but unless they can convince co-workers of their worth, the technical skills will be unobserved, unrewarding, and unused. So the importance of technical communication has to be noted. The engineers or scientists must present themselves effectively . Inevitably, it is a part of their responsibility to transmit understandably the results of their work to other people, both verbally and in writing.

How important is Technical Writing?

Nicholas D. Sylvester in his book Engineering Education has given data under the title "Engineering Education Must Improve the Communication Skills of its Graduates." From the data, it is observed;

"75 percent of engineering undergraduates take jobs in industry, where at least 25 percent of an engineer's time is spent in the reporting process. As the engineer moves up the managerial ladder, this time can increase to as much as 80 percent."

On the lack of communication skills, Nicholas observes;

"Engineers who cannot communicate – cannot spell, cannot make a sketch, have difficulty in all phases of communication with others. The student of today needs more ability than ever and a key need is to increase the ability to communicate both in speech and graphics. "

To present the ideas effectively, to transmit the ideas understandably and influentially both verbally and in writing, the communication skills should stand above all other types of skills. A survey was conducted to determine which academic skills are most needed for engineering careers in industry. The results show that communication skills rank above any other type of skill, capturing five of the most-needed skills, out of thirty-eight skills analyzed.

These five communication skills are:

Technical writing (2nd place)

Public speaking (4th place)

Working with individuals (6th place)

Working with groups (7th place) and

Talking with people (9th place)

What is Technical Writing?

Communication tasks are important to success in the technical professions and constitute a relatively large part of a job. Professionals should have clear organization in writing and logical reasoning. They should write clear and concise sentences. They should follow the standard conventions of grammar, punctuation, and other mechanics.

Writers of scientific and technical writing should produce sentences that readers can easily understand, and they should place those statements in contexts, paragraphs or larger units. So people in technical fields should study significant amounts of both oral and written work and learn to communicate in a variety of forms, especially shorter forms using technical terms for the specialists and longer or expanded form for the non-specialists. They can help also the non-technical people understand easily the technical terms. If the writers being familiar with the terms, present in a way that could be made intelligible, the terms can be easily understood by everyone.

For example, the full meaning of a term can often be expressed by simply 'unwinding' it from right to left and inserting the appropriate preposition(s). For example, the term "wall stresses" could be expanded as "stresses on a wall," "stresses inside a wall," "stresses produced by a wall," etc. Only the civil engineer can be sure that "stresses inside a wall"

is correct.

The correct interpretation of the term depends heavily on the reader's prior knowledge of the subject being discussed; the non-specialists would be able to guess the intended meaning of the compound term as a whole.

Likewise, there are many rules for making the scientific and technical writings easy for non-specialists too. From this perspective, communications skills are not just handy; they are critical tools for success, even survival, in 'real world' environments.

How to Acquire Technical Writing Skills

Engineers must understand the technology and economics of their projections, but these skills are worth very little unless they are paired with the ability to write and communicate. A good idea remains just that until it can be turned into a product, and the transition from idea to product requires that the engineer produce clear proposals demonstrating the idea's practicality and economic feasibility. Writing is a key element in this process. But how do engineers acquire writing skills?

Engineering curricula still rely extensively on the English department to teach writing. The engineering college often requires introductory composition classes, followed by a course on technical writing. While these are useful classes, they do not aim to show students the vital importance of writing skills in their profession and, by themselves, they are not nearly enough to help students develop skills for professional success.

Engineers in training may remain blissfully unaware of this deficiency, but once out in the field, they are soon conscious of this gaping hole in their preparation.

It is important to teach the undergraduates to break up their sentences. In engineering writing, as in much other writing, two or three sentences can often more effectively do the job than one sentence that is bloated and unclear. Further, again like the writers of engineering textbooks, engineering students assume they are writing for an audience of engineers. But in the real-work world of engineering, this is not necessarily true. The fact is engineers are often writing for project managers and others with little knowledge of the language of engineering.

In order to give students a taste of what it is like to write for an audience that does not share their technical jargon, students were asked to how a Bluetooth works , in language accessible to a high school student. Here is one student's effort.

The Bluetooth RFtransceiver operates in the unlicensed ISM band centered at 2.4 gigahertz (the same range of frequencies used by microwaves and Wi-Fi). The core system employs a frequency-hopping transceiver to combat interference and fading.

Bluetooth devices are managed using an RF topology known as a "star topology." A group of devices synchronized in this fashion forms a piconet, which may contain one master and up to seven active slaves, with additional slaves that are not actively participating in the network. In a piconet, the physical radio channel is shared by a group of devices that are synchronized to a common clock and frequency-hopping pattern, with the master device providing the synchronization references.

A good try and probably taken from a text book but the layperson is left with a bunch of questions. For instance, what is "star topology"? What are "piconets"? Many upper-division electrical engineering students would be hard-pressed

to know what this author is saying. So we must help students explain educational principles in laypersons' terms.

The difference between writing to learn and writing to communicate must be clearly taught to the students. Teachers should develop assignments for use in the classes. The students should be encouraged to discuss experiences with writing. Follow up and review processes must be there to help students acquire the necessary skills.

There are two overarching strategies which can help the teacher to guide the students in technical writing. One is the wisdom of what writing teachers call "scaffolding" and the other the power of peer review. As it turns out, both of these approaches connect to the real world of engineering writing.

Scaffolding—the process of moving through a series of ordered steps in developing a piece of writing—comes very close to the practice engineers and other professionals encounter when they generate and submit an article to a technical conference. The engineer-writer submits an abstract that receives comment from the conference organizers or journal editor. He or she writes the article, which is then sent out for peer review, and the reviewers' comments are incorporated in the final draft. This is "process writing."

The entire exercise is a lot of work for the students—and of course for the teacher—but this process provides a valuable lesson that can help students understand the kinds of writing skills and processes they will be called upon to use in the corporate or educational world after graduation. This kind of preparation gives them a jump-start on their future.

CONCLUSIONS

Technical writing skills are of utmost importance to engineering graduates. Apart from writing formally and accurately, the student should be aware of the purpose and objective of the writing task. He must also be aware of the kind of audience he is writing for and modify accordingly. The teacher must design various writing tasks to impart technical writing skills to the students and allow them to make mistakes, improve and perfect over time. Acquiring technical writing skills will pave the way for the student to succeed both academically and professionally.

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