

# Why Write Well?

*“There is a high order of correlation between beauty and clarity of expression. A slovenly designed and constructed sentence is an unsafe container of knowledge.”*

The quote is included in a book by Leggett and Glenn and is attributed to John J. O’Neil. It has general validity, but it should be taken to heart particularly by authors of technical material. Many academic papers and theses are unnecessarily difficult to follow, even for a narrow circle of experts. As described shortly, the importance of good writing in research publications cannot be overemphasized. Some authors seem to think that equations, data, and algorithms speak for themselves. Or perhaps the poorly written text is attributed to hurry, or lack of proficiency in English. Regardless, the result is harmful, for several reasons. Think of reading a well-written paper, whether it has actually occurred or not. It makes you feel inspired, engaged, and more knowledgeable. Regardless of who you are, it does not make you feel lost, overwhelmed, or disconnected from the material. Some may argue that this emphasis on “story-telling” and Discovery-Channel-pedagogy, i.e., attempting to reach a broader audience, negatively affects the technical depth and scientific quality. The opposite is true. A good presentation is imperative for comprehensive progress in science and engineering. Consider the following reasons to focus on good writing:

- Instead of being alienated, the reader becomes inspired, engaged, and educated
- The substance reaches and inspires a broader audience, thus providing grounds for broad and organic progress
- It dramatically increases the chance of passing a peer review process, if applicable
- It facilitates a meaningful discussion and scrutiny of the material, with the potential for further improvement and progress
- It reduces the chance that the research will be unnecessarily repeated later by others
- It prevents the impression that a lack of substance is purposely obscured
- It prevents the impression that an attempt is made to publish the material prematurely
- It prevents the reader, possibly a reviewer, to lose confidence in the authors, which could ultimately affect their reputation
- It helps to maintain reasonable academic standards, which fosters future developments

The importance of writing well is particularly noteworthy in the context of peer-reviewed publications. In fact, publication of peer-reviewed journal papers is the academic community’s primary venue of communication. Usually, two or three anonymous colleagues review a manuscript that is submitted to a journal. Based on their recommendation the material is either rejected or recommended for publication, often with modifications suggested during the review process. The review of poorly written papers is a heavy burden on the academic community. Particularly young reviewers who are still climbing the steep part of the learning curve are afraid of rejecting seemingly “advanced material.” They spend significant efforts trying to understand material that could have been explained better. Instead it should be rejected outright. Worse yet, the reviewer may adopt a mindset that submissions with subpar writing are acceptable. The

publication of poorly explained material reduces the community's collective motivation to make the effort to produce well-organized and well-written papers. Authors with insufficient capability to write well must hire an editor before submitting the material. This will also improve the chance of becoming published, regardless of the randomness that is associated with any review process.

On a historical note, the surprisingly high number of poorly written papers may signal a steady and worrisome decline in the focus on communication skills in science and engineering. In earlier times the study of rhetoric—the art of using language to communicate effectively—held great importance. It was a central topic in the ancient Greece, the Roman Empire, and even into the late 19<sup>th</sup> Century in Western teaching. This art seems lost in parts of the engineering and academic community. Unfortunately, this is reflected in public debates. Rational arguments by engineers and scientists rarely seem to provide the winning stance. Today, graduate students in research-oriented engineering programs rarely take courses on how to present their case in public assemblies. At best, engineering understanding and recommendations are entered into weakly documented code documents. Breaking this trend starts with a recommitment to pedagogy in presentation of technical material.