



## Regarding new terms and scientific jargon

Adapted from C. Wieman, February 26, 2008:

“I spent a couple of days trying to find answers to questions about learning technical jargon a couple of years ago. **The quick answer is that I could not find anything!** I am convinced that this is a major unexplored area for science education research. From research of my own group and others, I am convinced that the technical language is a major impediment to the learning of science {ed- especially when the “technical jargon” involves normal words that have been given new meanings by the experts. All disciplines have this problem.}

Finding no research on the subject, I asked **John Bransford (of How People Learn)** what he could tell me. He did some early work on language. He sent me a long reply, but brief summary was he did not know of research on learning technical jargon, but **some basic things about learning languages likely apply. Namely, to learn jargon, students have to practice using it in authentic discourse repeatedly and regularly, just as they would learn a foreign language.** It also would likely help them learn if they had to explicitly explain what the terms meant in their own words, perhaps to a younger sibling for example.

Also, I am confident that **cognitive load issues** are highly relevant to use of jargon. In other words, every new jargon term that is introduced in a class period will demand a heavy price in terms of thinking and “brain space”. **For each new term, there will be roughly 14% less working memory available for student to use to learn anything else in that class.** So you can be pretty confident that instructors should avoid introducing any jargon in lecture that is not ABSOLUTELY necessary. The cognitive load demands mean that any course that is introducing a lot of technical terminology effectively becomes a terminology course, whether you like it or not. There is just not enough brain left to learn anything else. This is why I advocate that any time you are establishing learning goals for a course, the **technical terms you want students to know are listed as explicit goals.** That helps one focus on what terms are essential and have to be covered, and implicitly also identifies which are not essential, and hence should not be used. You can also be pretty confident that **any jargon that is introduced to students, but they will not be called upon to use regularly after the course is over, they will very quickly forget.** So there is a very real waste of time and energy in using a nonessential jargon term. Students will not retain it, and it will reduce what they learn.

**So in a course (perhaps a first year service course) where the students will not be using terminology from that course in a subsequent course, I would advocate actually not introducing ANY jargon.** In a class where there is jargon that you want students to learn, I suggest having them review and have to answer some questions about the terms before coming to class. I have not done any research proving this works, but it seems likely that it will reduce the cognitive load when the term is used in lecture.

Carl.

P.S. I should have added that, although I never gathered quantitative data on it, when we started using clicker questions where students had to discuss with each other, their facility with the language of physics dramatically improved. In retrospect, it should have been obvious that this would happen.