

I really enjoyed this week's topic and readings as it resonates with me both as a language learner and a mathematics student. Many of the ideas discussed in the readings like the powers and limitations of context (Allen, 1999), use of etymology in vocabulary teaching (Zygouris-Coe, 2015), and learning vocabulary through discourse (Heuer, 2005) are concepts that I have personally experienced through education or individual exploration. Thus, when I'm met with new vocabulary, I always challenge myself to figure out or at least come to an educated guess of the definition before looking it up in a dictionary, which not only helps me learn specific words but also prepares me for new vocabulary down the road. Unfortunately, this is what I don't usually see happening with students. Whether it is because the students themselves are not putting in the effort to hone their vocabulary analysis and acquisition, or it is because teachers are not integrating the teaching of vocabulary into their lessons, the end result is still students blindly using certain words and applying procedures without fully understanding their origins or what they actually mean. I want to preface that Mathematics (along with other sciences) are more eccentric when it comes to vocabulary: Zygouris-Coe (2015) and Heuer (2005) both touched upon the fact that words in mathematics usually have different meanings than everyday use and that symbols only complicates the situation even more. This is why I think half of the struggle with learning mathematics lies with learning the vocabulary alone, and if teachers fail to establish a concrete understanding of mathematics vocabulary for students, learning mathematics can be a struggle beyond just problem solving, which is already a challenging task. Students without a strong command of vocabulary frequently struggle with application or connection of concepts because, once again, they only know how to apply given formulas or computations to specific problems without understanding what the concepts really mean, thus limiting their ability to apply the same concepts to different situations. The clearest example of this comes from the concept of "logarithm". It's arguably simple to teach students logarithmic rules and computations, but from my own teaching experience, most students are not equipped with the definition of "logarithm" itself - where it came from, what it does, and why it matters. They can perform calculations just fine, but cannot explain why those calculations work. They can "take the natural log of both sides" but cannot tell me what is "natural log" and why we need to take it. It is honestly infuriating that we allow the teaching of mathematics to come to this point, where students can do but cannot understand or apply mathematics at all. I agree that there is jargon in all academic fields, but to me, mathematics is the least offender in all of the fields and that the existence of jargon is not an acceptable excuse for the ineffective learning and teaching of mathematical vocabulary, especially when the majority of mathematics is spent on defining concepts and learning a new concept is basically just learning a new set of vocabulary. To remedy this, mathematics teachers need to seek a reconnection between mathematics and literacy, treating mathematics as a language where vocabulary and syntax is an integral part of its acquisition rather than peripherals that are treated as placeholders for mindless calculations and computations. Thus, the idea of discourse-rich instruction proposed by Heuer (2005) strikes me as vital in reshaping the teaching and learning of mathematics vocabulary. The same way immersion aids the learning of foreign languages - consistent use of accurate mathematics vocabulary to explain concepts and justify ideas can greatly assist the acquisition of mathematics as a language.

References

- Allen, J. (1999). Larger Contexts: Meaningful, Connected, and Rich Uses of Language. In *Words, words, words: Teaching vocabulary in grades 4-12* (pp. 15–31). Stenhouse.
- Allen, J. (1999). Reading as the Heart of Word-Rich Classrooms. In *Words, words, words: Teaching vocabulary in grades 4-12* (pp. 67–94). Stenhouse.
- Heuer, L., & Kenney, J. M. (2005). Graphic Representations in the Mathematics Classroom. In *Literacy strategies for improving mathematics instruction* (pp. 51–71). ASCD.
- Heuer, L., & Kenney, J. M. (2005). Discourse in the Mathematics Classroom. In *Literacy strategies for improving mathematics instruction* (pp. 52–86). ASCD.
- Zygouris-Coe, V. (2015). Vocabulary Learning and Instruction in the Disciplines. In *Teaching discipline-specific literacies in grades 6-12: Preparing students for college, Career and workforce demands* (pp. 132–173). Routledge.