



Writing to Learn (2014-2017)

CHALLENGES

I teach the foundational Engineering course, Introduction to Fluid Mechanics (CE 231), where up to 30% of students fail every year. This course is critical because it serves as a pre-requisite for CE 331 and as preparation for the fluid's section of the Fundamentals of Engineering (FE) Examination conducted by the National Council of Examiners for Engineering and Surveying (NCEES). Students perceive CE 231 as the most difficult course in the Civil Engineering Department.

The majority of engineering students do not see the value of writing, do not enjoy writing, and do not apply adequate effort to their writing. For example, students in CE 231 struggle to:

- Interpret a problem statement.
- Write and manipulate mathematical formulas.
- Conduct laboratory experiments.
- Analyze and interpret results from experiments.
- Write reports using correct grammar and spelling.

“Through discussion and sharing ideas and experiences with faculty from different disciplines, I was able to use writing-to-learn strategies to improve student learning, not only in CE 231, but in other courses as well.”

MY PROJECT

My hypothesis was that more writing in CE 231 would support better student learning. For my project I designed a Homework Assignment Template (HAT) to utilize writing as method for learning. The template required students to read the assigned problem(s); write a problem statement; identify information that was given in the problem; identify the question(s) asked; and then solve the problem. The HAT allowed students, through the writing process, to analyze and solve the problem as well as to interpret the results.

RESULTS

The preliminary data shows that students failing the class has decreased in general from 30% to 12% (FA014 – 24%, N = 29 students; SP015- 33%, N = 24 students; FA015-14%, N = 22 students, SP016-12%; N = 26 students). The results of a student survey about the implementation of the HAT template indicated that students felt the template helped them to solve problems more accurately. My personal observation was that students who followed the HAT template improved their skills in solving problems, organizing their work, and reducing errors in their calculations. The HAT template helped me as instructor to follow students' work and provide them with feedback step by step. I presented these results in the NMHEAR conference in Albuquerque on February 25, 2016. The HAT will now be used across various Civil Engineering Courses.