**Student Journaling Observations – A Qualitative Approach to Improving my Teaching**

**Process:**

Prior to Fall 17, I required students to turn in a workbook with 20+ completed problems (drill and kill).

Prior to Fall 17, I collected 5-10 problems to grade each week.

Fall 17 – Present, students are expected to explain only 3-5 problems in a journal. The journal is a reflection and detailed explanation of the work they are doing.

Fall 17- Present – students are encouraged to practice in their workbook (drill and kill), but these problems are not collected.

Fall 17-Present – only 2-5 problems (drill and kill) are collected along with the journal.

**Goal** – improve writing, critical thinking skills, and address CLOs

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| Students will be able to clearly communicate and defend their work in verbal, written, and visual formats | Students will be able to interpret and draw inferences from information presented verbally, graphically and analytically. | Students will be able to determine the most appropriate tools/techniques to solve a particular problem. |

**Results (Observations)**:

There has been no statistically significant difference in completion and success rates (journaling vs. non-journaling). If anything, students in calculus I complain more about journaling because it is new to most of them. By the time students are in calculus III or differential equations, they have become accustomed to journaling and have seen the benefit of this from also journaling in physics and chemistry.

Students’ writing ability in my courses has improved from my observations between calculus I to calculus III journals. Since I require to write after every class, I have seen an improvement in how they explain problems to each other in class during class discussions, and this addresses CLO #1. I have also seen an increase in using appropriate math language. These observations have help me as an instructor adjust my teaching each semester.

Since students are expected to explain concepts in the journal multiple ways, I use this to assess all three CLOs. I have noticed that students who have a solid and well written journal meet all three CLOs. Students who have trouble writing down their thoughts and explanations typically do not do well with CLO #1 and #2. Yet, they may still be able to do #3 because that is more skill based.

**Updated Summer 2020:**

After requiring a journal for the last three years in calculus I, II, III and differential equations, I have continually tweaked my expectations of what students need to write in the journals. By the time students reach differential equations, journals are much more robust.

What I have learned as an instructor from these journals is where students struggle the most with certain concepts. Through reading student explanations of topics and reviewing the questions they have, I am seeing and finally understanding WHY students are struggling with certain concepts. For example, students struggle with the calculus CLO of “Identifying the most appropriate technique to solve the problem.” I have changed my course to include more problem-solving skills to help students identify the correct technique. By incorporating this more into my classes, I noticed that my Fall 2019, Spring 2020 and Summer 2020 students seemed to identify the correct technique faster than in the past. I will still make more modifications to what I do in the fall by requiring students to first identify the type of function we are working with. Once they identify it, I will have them explain to me how to solve this type of function in words. I hope to see students continually improve with CLO #3

In a personal conversation with Mel Artz who has been teaching differential equations in Fall 2019 and Spring 2020, and he doesn’t require a journal, he has noticed that many students are doing journals on their own. He has also noticed that these students have a better grasp of differential equations concepts. He is considering requiring journals in his courses in the future based off of his observations.