Introduction

- Writing curriculum-based measurements (CBMs) are timed (up to 7 minutes) writing tasks performed in response to a prompt.
  - Prompt types include narrative (story telling) and expository (explanatory).
  - Efficient, quantitative, objective alternative to grading rubrics and portfolio-based writing assessment
  - Have been used previously to evaluate K-12 student writing, but not at the post-secondary level.
- Written communication in STEM is an important area of graduate student development, but writing assignments are time consuming to grade and analyze.
- Many graduate students are English Language Learners (ELL), adding an additional challenge to writing instruction and scoring.

Research Questions

1. Is there a difference in the writing abilities, as measured by narrative CBMs, before and after the course for all students?
2. Is there a difference between the growth of ELL and traditional graduate students as measured by CBMs?
3. Is there a difference between pre- and post-instruction scores on narrative versus expository text composition?

Methods

- Study performed Fall 2017 with Engr 691: Special Topics: Written Geoscience Communication (IRB Protocol #18x-215)
- Demographics: 20 Graduate students:
  - 3 M.S.
  - 4 Ph.D.
  - 13 English-language learner (ELL)
  - 0 Native English speaker

- One 7-minute narrative prompt on first day of class (8/23/17).
- One 7-minute narrative prompt on last day of class (12/1/17).
- One 7-minute expository prompt on last day of class (12/1/17).

Results

Question 1:

- TWW significantly higher on post-instruction writing task ($\bar{x} = 107.1$) than pre-instruction task ($\bar{x} = 88.7$; $p = 0.01127$).

Question 2:

- For ELL students: TWW significantly higher on post-instruction writing task ($\bar{x} = 89.6$) than pre-instruction task ($\bar{x} = 66.6$; $p = 0.008626$).
- For non-ELL students: WSC significantly higher on post-instruction writing task ($\bar{x} = 99.0$) than pre-instruction task ($\bar{x} = 97.9$; $p = 0.03009$).

Question 3:

- For all students: TWW significantly lower on expository task ($\bar{x} = 91.4$) than post-instruction narrative task ($\bar{x} = 107.1$; $p = 0.03019$).
  - Attributed to increased confidence and comfortability with writing among ELL students.
- Native English speakers increased WSC between pre- and post-instruction narratives.
  - Attributed to increased experience with reading & writing.
- Unfortunately, CWS did not improve for ELL students.
  - Differentiated instruction may improve this.
- All students wrote fewer words on the expository prompt than on the narrative prompt.
  - Attributed to more limited narrative freedom and vocabulary needed to explain a preexisting idea.

Conclusions and Implications

- All students and ELL students increased total words between pre- and post-instruction narratives.
  - Attributed to increased confidence and comfortability with writing among ELL students.
- Native English speakers increased WSC between pre- and post-instruction narratives.
  - Attributed to increased experience with reading & writing.
- Unfortunately, CWS did not improve for ELL students.
  - Differentiated instruction may improve this.
- All students wrote fewer words on the expository prompt than on the narrative prompt.
  - Attributed to more limited narrative freedom and vocabulary needed to explain a preexisting idea.

Application of Curriculum Based Measurement to Assess Graduate Writing in the Geosciences

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