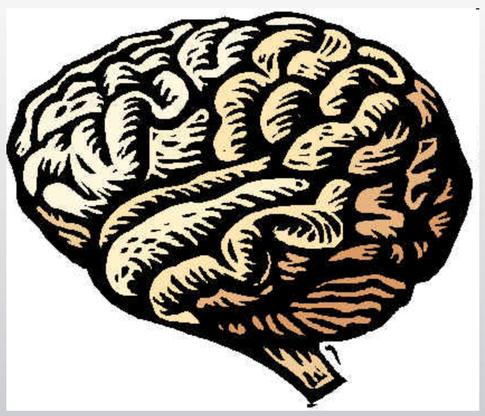


Think About it! Portfolios that Utilize Metacognitive Activities

Background

I conducted my capstone project at A. P. Giannini Middle School in the Sunset District of San Francisco, California. I chose my topic after observing a large achievement gap between high-performing students and low-performing students. I believe recent studies on the importance of cognition and metacognition are at the heart of the achievement gap. Acquisition of skills enabling students to learn content-rich subjects, such as science, are necessary in a competitive test-driven academic environment. Teachers, students, and parents will benefit from the teaching and learning techniques demonstrated by my project.

Research Questions

Focus Question

What is the effect of portfolio assessments that utilize metacognitive activities on student understanding of seventh grade science concepts?

Sub- Questions

1. What are the effects of using portfolio assessment on students' science literacy?
2. What are the effects of using portfolio assessments on general education and English language learner students?
3. What are the effects of portfolio assessments on student attitudes and motivation?
4. What are the effects of portfolio assessments on my attitudes and motivation as a teacher?

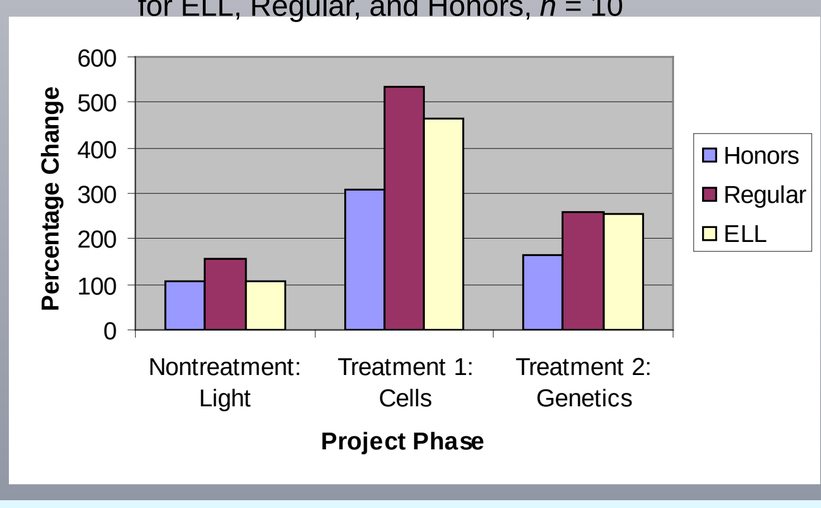
Data Collection/Analysis Methods

Research Questions	Data Source 1	Data Source 2	Data Source 3
Focus Question	Interviews with concept mapping	Pre and post treatment assessments	Student science survey
Subquestion 1	Pre and post treatment writing	Reflective journals	Writing samples from portfolios
Subquestion 2	Student attitude survey	Classroom observations	Student science survey
Subquestion 3	Interviews with concept mapping	Pre and post treatment assessments	Teacher Journals
Subquestion 4	Classroom observations	Colleague interviews	Teacher journals

Treatment

The study began with a nontreatment unit on light. During the nontreatment, a quiz and multiple-choice end-of-unit test were used to assess student understanding. Two mini-units on the microscope and cell biology and a unit on genetics were used as the treatment units. During these units, students used metacognitive activities, such as concept mapping, graphic organizers, class blogs, conferencing, portfolio entries, and portfolio cover pages, to aid in their understanding of the concepts.

Percent Change Pre and Postassessment for ELL, Regular, and Honors, *n* = 10



Percentage Change in Preassessment to Postassessment, Regular/ELL (n =32) and Honors (n = 31)

Unit	Class	Pre (%)	Post (%)	Percentage Change
Nontreatment: Light	Honors Regular/ELL	40 26	78 58	95 123
Treatment 1: Cells	Honors Regular/ELL	18 9	80 52	344 478
Treatment 2: Genetics	Honors Regular/ELL	30 16	70 59	133 269

Results

This study shows that metacognitive activities increased student understanding of seventh grade science concepts. Student attitudes and motivation increased in important areas such as enjoying school, ability to work independently, and reaching potential. Through the use of portfolios, I was able to assess my teaching techniques enabling me to review and reinforce areas of confusion. By looking at the improvement levels of ELL compared to general education and honors students, I was able to find evidence of closing the achievement gap.

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