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Math Self-Efficacy and Performance

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Math Self-Efficacy and Performance

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Questions

- In what ways are students' math self-efficacy and grade-based performance related?
- What aspects of math self-efficacy are predictors of performance?

Methodology

- **Participants:** Approximately 90 high school students enrolled in Algebra II
- **Data Sources:** Teacher Journals, Questionnaires/Exit Slips, and Literature Review
- **Data Analysis:** Self-Efficacy Theory (Betz & Hackett ,1989)

Literature Review

- The *Social Cognitive Theory*, encompasses concepts related to self-concept, anxiety, self-esteem, and self-efficacy (Bandura, 1997 as quoted in Kitching, 2011).
- Self-beliefs determine the action a person takes with the knowledge he possesses. This can explain why people's performance differs when they have similar skills and knowledge (Pajares, 1995).

Procedures

- Observed students and kept a weekly teacher journal focusing on student interactions, body language, and work.
- Questionnaires were given with each test (Shown in Figures 1 & 2 below).
- Exit Slips were given halfway through a chapter asking students to rank confidence in chapter areas & what they need to feel prepared for the test.
- Self-Efficacy Theory (Betz & Hackett ,1989) was used to analyze data.

Solving systems of equations graphically

0	1	2	3	4
I feel like I know nothing about this area	I don't feel confident in what I know about this area	I am sometimes confident in this area	I am fairly confident in this area on most problems	I am very confident in this area on every problem
Why?				

Solving systems of equations by elimination

0	1	2	3	4
I feel like I know nothing about this area	I don't feel confident in what I know about this area	I am sometimes confident in this area	I am fairly confident in this area on most problems	I am very confident in this area on every problem
Why?				

Solving systems of equations by substitution

0	1	2	3	4
I feel like I know nothing about this area	I don't feel confident in what I know about this area	I am sometimes confident in this area	I am fairly confident in this area on most problems	I am very confident in this area on every problem
Why?				

Linear programming

0	1	2	3	4
I feel like I know nothing about this area	I don't feel confident in what I know about this area	I am sometimes confident in this area	I am fairly confident in this area on most problems	I am very confident in this area on every problem
Why?				

Figure 2. Questionnaire asking students to elaborate on confidence levels..

Figure 1. Front page of questionnaire given to students.

Solving systems with three variable

0	1	2	3	4
I feel like I know nothing about this area	I don't feel confident in what I know about this area	I am sometimes confident in this area	I am fairly confident in this area on most problems	I am very confident in this area on every problem
Why?				

This chapter as a whole

0	1	2	3	4
I feel like I know nothing about this area	I don't feel confident in what I know about this area	I am sometimes confident in this area	I am fairly confident in this area on most problems	I am very confident in this area on every problem
Why?				

On this test I feel the grade I will receive will be ____%.

Why?

What can you do over the weekend to make yourself more confident entering the test?

Results and Data Analysis

- By triangulating the results of teacher journals and questionnaires students were identified as having high or low math self-efficacy.
- Based on the literature reviewed, students with high self-efficacy were confident on questionnaires, participated often in class, and displayed other strong academic qualities.
- Student predictors of grades were similar to actual grades received.
- Betz & Hackett (1989) state that self-efficacy influences and is influenced by thoughts, arousal, behavior, and task performance.

Conclusion

- Self-efficacy and performance have a reciprocal relationship; self-efficacy affects performance and performance also affect self-efficacy.
- Student's own assessment of performance is a good predictor of actual performance.
- Future research it will need to take all aspects of a students life into account

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