Developing Mathematical Perseverance

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Teacher Observations: Students' beliefs in hard work and math perseverance

-Students give up easily when assigned individual math practice assignments.

-Students exhibit minimum math skill levels.

-Students fear failure in math due to their lack of success in math.

-Students have no personal interest in math.



Teacher Observations: Students' beliefs in self expectations and teacher assistance

-Students have low expectations of their math skills.

-Students do not trust teachers to assist with their math deficiency (no warm and fuzzy relationship).

-Students believe that **no one cares or has concern** about their learning process.

-Students have tunnel vision in solving math problems (one method only).



Action Research: Class Goals

We set class goals for students to meet by the end of each grading cycle.

Algebra 2

1A 9 WEEKS GOAL

TRACKER

75%

Lycle	Checkpoint	Checkpoint	Final
1st			
2nd			
3rd			
4th			

Algebra 2 Pre-AP/GT

2A 9 WEEKS GOAL

TRACKER

\$7%

Lycle	Checkpoint	Checkpoint	Final
1st			
2nd			
3rd			
4th			

Results: Class Goals



Action Research: Study Groups

Students in study groups:

- complete homework assignments via whiteboard demonstrations, etc.

- review for exams
- prepare for SAT/ACT Math
- prepare for college entry exams



Results: Group Study Sessions

-Students built team collaboration skills within different math ability levels.

-Students improved math communication skills.

-Students gained self-confidence in math.

-Student sought interest in math career opportunities.

-Students' overall grade averages improved significantly.

-Students developed research capabilities (i.e., DESMOS.com, YouTube Video).

-Students demonstrated mastery of learning through peer tutorials <u>on/off</u> campus (icloud).

-Students broke barriers of peer pressure by co-coaching one another in the area of math.



Action Research: Modeling Perseverance

-The teacher modeled perseverance for students.

-Students were given opportunities to practice perseverance.

-Teacher set class goals.

-Students participated in study groups.



Model Perseverance

-The teacher shares some instances when he or she needed perseverance to accomplish a difficult task.

-The students share their experiences of perseverance through a difficult life experience.

-Show videos of inspiring people who persevered.

Practice Perseverance

-The teacher presents challenging problems but accessible problems and offers limited or no assistance.

-The challenging problems are logical thinking exercises, puzzles, riddles, etc.

Example: Make as many different numbers as you can using grouping symbols, operations, and only 4 fours.

Example : A cage contains birds and rabbits. There are 16 heads and 38 feet. How many birds are there in the cage?

Student Survey

- Measured students' feelings towards math group work and the ways they could see success
- Focused on the idea of learning with and from other students

Question 1:

I learn the most in math class from working with other

students.



Question 2:

A really good way for me to understand an idea in mathematics is to explain it to someone else.



Question 3:

A really good way for me to understand an idea in mathematics is to have another student explain it to me.



Question 4:

A really good way for me to understand an idea in mathematics is to apply it to a real-world problem.



Ways to adapt

Goals:

Study Groups:

- Colorful charts
- More specific goals
- Individualized

- Interactive notebooks
- Rubric common based
 - assessments/project
- Math flashcards

Perseverance:

- Skill-level puzzles
- Real-world application videos



