



ACADEMIC SELF-REGULATION AND THE POWER OF PEERS: DEVELOPING ACADEMIC SELF-REGULATION AND INTEREST IN 9TH GRADE BOYS TAKING AN ALGEBRA II HONORS CLASS

St. Paul's School for Boys



ST PAUL'S

SCHOOL FOR BOYS

We are—

**Episcopal Roots
Strong Connections
Small with Big
Opportunities**





**SEEK TRUTH, KNOWLEDGE
AND EXCELLENCE;
LIVE BY FAITH, COMPASSION
AND INTEGRITY.**
- ST. PAUL'S SCHOOL MISSION

Why is Academic Self-regulation and ► Interest in Boys Important?



Post-Secondary Outcomes

43% of current college enrollees being male compared to 57% of college enrollees being female (Conger, 2015; Hussar & Bailey, 2011; NCES, 2017).



Self-Regulation and 21st Century Skills

Both academic self-regulation and high levels of motivation are correlated to high academic performance and other positive outcomes such as college attainment (Farrington et al., 2012; NCES, 2018).



► Academic Self-Regulation Explained

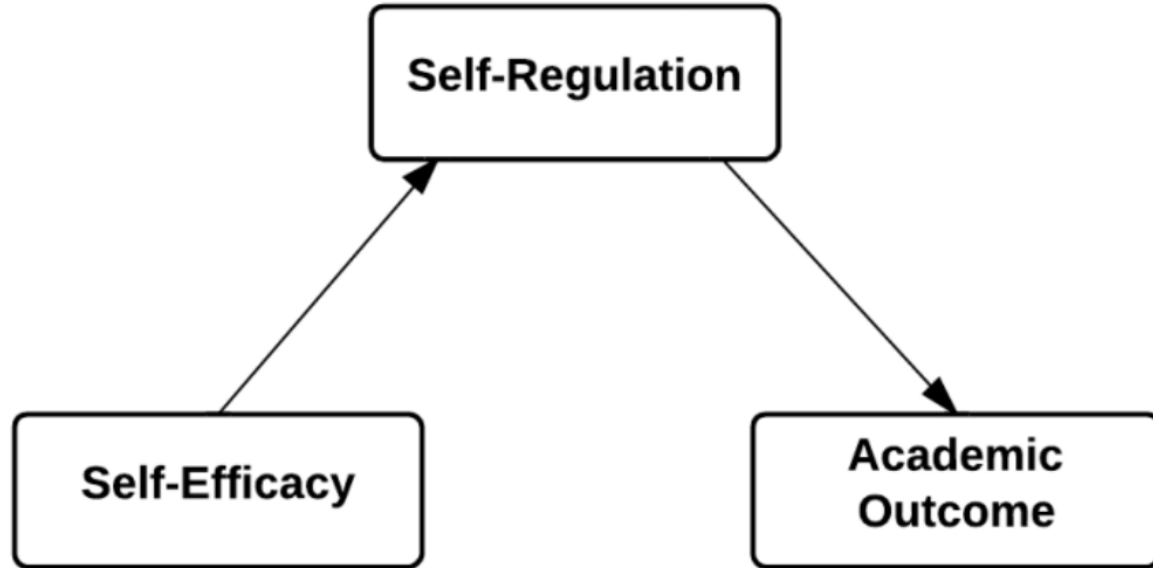


Figure from: Los, R. E. (2014). *The effects of self-regulation and self-efficacy on academic outcome.* University of South Dakota.

“In order to succeed, people need a sense of self-efficacy, to struggle together with resilience to meet the inevitable obstacles and inequities of life.”

Albert Bandura

Research Question: How might peer-led activities by 11th and 12th grade boys foster academic self-regulation and interest in 9th grade algebra students?



The Students of Mr. De Boer's Algebra II Honors Course



► The **Action**

Peer-led discussion

Upperclassmen
6 students from
higher level math
courses each taught 2,
20-minute lessons

Real World

Relevance
Upperclassmen
spoke about real-
world applications
and personal
experiences

Study Skills

Self-
Regulatory
Strategies
Upperclassmen
taught specific
study skills .





Real Life Examples- SAT

$$\begin{aligned}x + y + 3z &= 600 \\x + y + z &= 400\end{aligned}$$

In the system of equations above, what is the value of $x + y$?

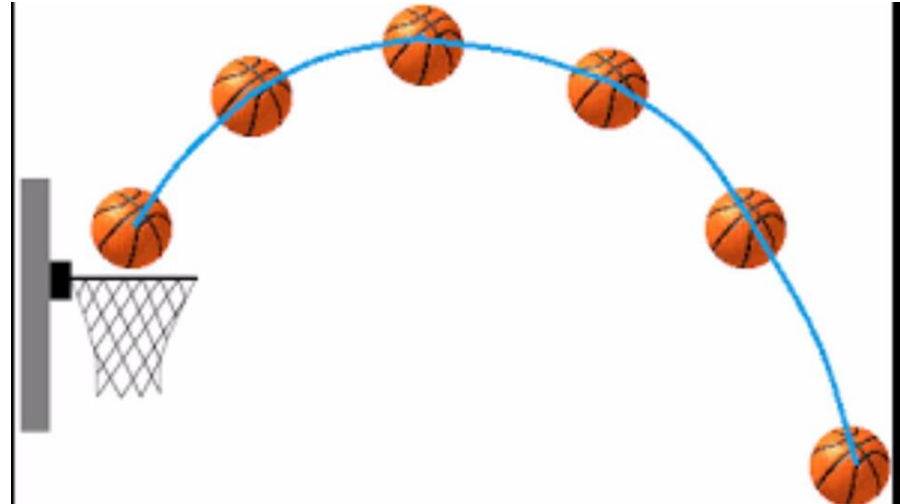
$$\begin{aligned}x &= 3v \\v &= 4t \\x &= pt\end{aligned}$$

For the system of equations above, if $x \neq 0$, what is the value of p ?

$$\begin{aligned}3x + 2y + 2z &= 19 \\3x + y + z &= 14\end{aligned}$$

If the equations above are true, which of the following is the value of $y + z$?

- (A) -5
- (B) -4
- (C) 0
- (D) 4
- (E) 5



► Data Collection



Adapted MSLQ (Pintrich, 1991)

Motivated Strategy for Learning Questionnaire--Revised
MSLQ

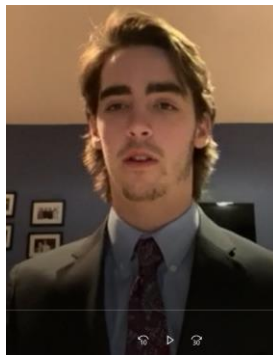
Revised Items Adapted to Math (High School Students)

Goal Setting or Planning

1. I plan how I am going to study new math topics before I begin.
2. Before I begin studying math I think about what and how I am going to learn.
3. Before I study math, I plan how much time I will need to learn a topic.
4. When I learn new topics in math, I first figure out the best way to study.
5. Before I study math, I set goals for myself to help me learn.



Student Interviews



Journal Entries and Work Products

1. In your opinion, would hearing from an upperclassmen student about quadratic formula help you understand the material more in the future? Please explain.

Because of the stronger relationship with a senior student, I feel like I can understand more material easily due to the way they explain things.

Data Analysis

- ▶ **Exploratory Sequential Design**
(Mertens, 2018)
- ▶ **Pattern Coding Procedure**
(Miles, Huberman, & Saldana, 2014)
- ▶ **Mean Averages of Likert Scales**
- ▶ **Incorporated Networked Map**
(Miles, Huberman, & Saldana, 2014)



FINDINGS

Some surprises!



**Development of
greater self-
efficacy**

**The importance
of novelty**

**No significant
changes in levels of
relevance**

Student Impact



Thanks!

Does anyone have any questions?

cdengler@stpaulsmd.org
St. Paul's School for Boys



References

- Becker, G. S., Hubbard, W. H., & Murphy, K. M. (2010). The market for college graduates and the worldwide boom in higher education of women. *American Economic Review*, 100(2), 229-33.
- Cham, H., Hughes, J. N., West, S. G., & Im, M. H. (2015). Effect of retention in elementary grades on grade 9 motivation for educational attainment. *Journal of school psychology*, 53(1), 7-24.
- Conger, D. (2015). High school grades, admissions policies, and the gender gap in college enrollment. *Economics of Education Review*, 46, 144-147.
- Derakhshanrad, S. A., & Piven, E. (2018). A Cognitive Neurodynamic Approach to Prediction of Students' Adaptation to College: An Ex-Post Facto Study. *Basic and clinical neuroscience*, 9(3), 217.
- Farrington, C. A., Roderick, M., Allensworth, E., Nagaoka, J., Keyes, T. S., Johnson, D. W., & Beechum, N. O. (2012). *Teaching Adolescents to Become Learners: The Role of Noncognitive Factors in Shaping School Performance--A Critical Literature Review*. Consortium on Chicago School Research. 1313 East 60th Street, Chicago, IL 60637.
- Hulleman, C. S., Kosovich, J. J., Barron, K. E., & Daniel, D. B. (2017). Making connections: Replicating and extending the utility value intervention in the classroom. *Journal of Educational Psychology*, 109(3), 387.

References

- Hulleman, C. S., Kosovich, J. J., Barron, K. E., & Daniel, D. B. (2017). Making connections: Replicating and extending the utility value intervention in the classroom. *Journal of Educational Psychology*, 109(3), 387.
- Hussar, W. J., & Bailey, T. M. (2009). Projections of Education Statistics to 2018. NCES 2009-062. *National Center for Education Statistics*.
- Jacob, B. A. (2002). Where the boys aren't: Non-cognitive skills, returns to school and the gender gap in higher education. *Economics of Education review*, 21(6), 589-598.
- Komarraju, M., Ramsey, A., & Rinella, V. (2013). Cognitive and non-cognitive predictors of college readiness and performance: Role of academic discipline. *Learning and Individual Differences*, 24, 103-109.
- Lochmiller, C. R., & Lester, J. N. (2015). *An introduction to educational research: Connecting methods to practice*. Sage Publications.
- Mertler, C.A. (2017). *Action research: Improving schools and empowering educators* (5th Edn). New York: Sage Publishing.

References

Organization of Education Cooperation Development . (2017). *Education at a glance 2017: OECD indicators*. OECD.

Pintrich, P. R. (1991). A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ).

Pilegard, C., & Fiorella, L. (2016). Helping students help themselves: Generative learning strategies improve middle school students' self-regulation in a cognitive tutor. *Computers in Human Behavior*, 65, 121-126.

Ryan, A. M., & Pintrich, P. R. (1997). " Should I ask for help?" The role of motivation and attitudes in adolescents' help seeking in math class. *Journal of educational psychology*, 89(2), 329.

Schunk, D. H., & Ertmer, P. A. (2000). Self-regulation and academic learning: Self-efficacy enhancing interventions. In *Handbook of self-regulation* (pp. 631-649). Academic Press.

Schünemann, N., Spörer, N., Völlinger, V. A., & Brunstein, J. C. (2017). Peer feedback mediates the impact of self-regulation procedures on strategy use and reading comprehension in reciprocal teaching groups. *Instructional Science*, 45(4), 395-415.