



Examining SCSU “OwlsTeach” Noyce Scholars’ Growth Mindsets for Teaching

Carrie-Anne Sherwood, Ph.D., College of Education, Southern Connecticut State University

sherwoodc4@southernct.edu

@CASherwood



Need

As several studies have shown, teachers' mindsets significantly influence their teaching practices and, consequently, student learning outcomes (e.g., Dweck, 2006; Yeager et al., 2022). Teachers with a growth mindset are more likely to engage in ongoing learning and seek out opportunities for improvement (Haimovitz & Dweck, 2017). By understanding and fostering a growth mindset among preservice STEM teachers, this research contributes to the development of effective educators who are better equipped to support student learning and success in STEM disciplines. Moreover, by identifying and understanding more about the self-described origin of preservice teachers’ mindsets for STEM teaching (e.g., from a specific course, or aspect of our Noyce program) this study aims to inform the design and delivery of supports within STEM teacher education programs tailored to the unique needs of preservice science and math teachers, ultimately enhancing their effectiveness in the classroom (Yeager & Dweck, 2012). Furthermore, mindset interventions have the potential to promote equity and inclusion in education by challenging stereotypes and fostering a belief in the ability of all students to succeed (Good et al., 2003). By examining the growth mindsets of preservice teachers, particularly within the context of science and math education where achievement gaps persist, this research contributes to efforts aimed at creating more inclusive learning environments where every student feels valued and supported in their academic pursuits.

Guiding Question

With this exploratory study, we are interested in answering the following question: **In what ways do our Noyce Scholars’ beliefs about STEM teaching and learning align with a growth mindset perspective?**

Broader Impacts

By uncovering insights into growth mindsets among STEM preservice teachers, the study has the potential to inform teacher education programs, enabling educators to better prepare future teachers to promote student learning and resilience in science and math classrooms. Promoting growth mindsets among teachers has the potential to positively impact student achievement and equity in education, as inclusive and supportive learning environments grounded in the belief that all students can succeed are fostered. Additionally, the research has the potential to advance scholarship on growth mindset, particularly in relation to STEM preservice teachers who are training to become teachers in high needs LEAs.

Future Work

- Interrogate Scholars’ mindsets at their entry to the program & compare with mindset at completion
- Examine Scholars’ mindsets (& how they may change over time/as they become teachers)
- Compare to non-Noyce STEM majors
- Examine the role of “failure” in choices of current & former STEM majors & teachers

Abstract

This exploratory study explores the growth mindsets of three of our SCSU “OwlsTeach” Noyce Scholars, aiming to enhance teacher effectiveness, improve student achievement, and promote equity in education. Drawing on Carol Dweck’s Growth Mindset theory (2006) and existing literature, the study investigates the alignment of preservice STEM teachers’ beliefs about teaching with growth mindset principles and identifies some self-reported factors that shaped their mindset development. Through focus group discussions with our Noyce Scholars, thematic analysis will identify recurring themes in their experiences, beliefs, and perceptions related to their growth mindset development for teaching. Anticipated outcomes include an understanding of the growth mindset for teaching of our Scholars, including the impact of various aspects of our teacher preparation program on their mindset development. We expect outcomes of this study will inform the design of supports to foster growth mindsets among all teacher candidates in our programs. Broader impacts of this work include promoting inclusive learning environments, advancing equity in education, and contributing to growth mindset scholarship, particularly in relation to STEM preservice teachers who are training to become teachers in high needs LEAs.

Outcomes

Findings presented as themes with example quotes from Scholar interviews:

Theme	Quotes
Embracing Challenges and Learning from Struggles Individuals with a growth mindset see challenges as opportunities to learn and grow, rather than as obstacles.	“I think there should be, you know, difficulties and struggles and things that you look to improve...education is always a learning curve.” (1) “That connection between you know pushing through the adversity and the growing pains, if you will, is always going to be a valuable lesson in education.” (1) “I was never the best like math student in terms of like super smart...I was okay with getting stuff wrong on like my exams or on my quizzes but what I was more concerned about is like okay what did I do wrong here...” (2) “Every single thing that happens like if I could break a leg or whatever and [my father] would be like okay but what did you learn?” (3)
Persistence in the Face of Setbacks Individuals with a growth mindset view setbacks as temporary and embrace them as opportunities for improvement. They demonstrate resilience and perseverance in the face of challenges.	“Some people look at when they first start trying to learn something if they’re not inherently or immediately good at it they just stop and refuse to, you know, push through that adversity and, you know, really try and learn what they’re doing rather than, you know, pushing through.” (1) “I’m just always going to have the mentality of I might make mistakes here and there but I’m always willing to learn as much as possible.” (2) “Every different school you go to, like I just finished my subbing today which is another school that I was at was again a learning process because those procedures were different.” (3)
Effort as a Path to Mastery Individuals with a growth mindset believe effort and dedication lead to improvement and mastery.	“I think the advice of a previous teacher, the journey of a thousand miles begins with a single step...adversities may come but trudging in that direction will get you those thousand miles.” (1) “I feel like if you work hard the grades will come in naturally...I was never the one to be super concerned about my grade.” (2) “I think being in the field as much as possible helps a lot.” (3)
Learning as a Continuous Process Individuals with a growth mindset see learning as an ongoing journey.	“Education is always a learning curve. It is always some kind of journey that you start off in one place and you end up in a different place.” (1) “I’m just continuously learning whether it be math, classroom management, delivery, lesson planning...” (2) “Teachers are always learning, they will never stop learning.” (2) “I think like teaching it really is a learning process even if you’re 30 years into it it’s still learning.” (3)
Importance of Mentors and Community (Support Systems) Support systems play an important role in fostering growth mindset in individuals.	“My mentor teacher who I took over her classes for actually really helped me get through a lot of my early struggles.” (1) “It’s good to have mentors or people above you just pushing you to keep trying and persevering...Dealing with those early signs of struggle and adversity was nice to have that kind of mentor.” (1) “I went through like three different or two different algebra teachers and I went through like three different Spanish teachers and my teachers at high school they just they didn’t give me enough feedback so I...those are the small little details, the small things that I want to try to change when I when I come into this profession.” (2) “Both my sisters are teachers so I talk to a lot of teachers...and that’s still always going to be like a learning process.” (3) “It’s my dad that makes me think of everything as a learning thing...if something happens he’ll always say like what did you learn from that?” (3)

Approach

Method

The theoretical framework for this study is primarily based on Carol Dweck’s Growth Mindset theory (2006), which posits that individuals’ beliefs about intelligence and learning can significantly impact their behaviors, attitudes, and ultimately, their success. With a small number of Scholars (n=3), our study is exploratory and qualitative. This study was inspired by our Scholars’ responses to some of our external evaluator’s questions from our most recent (Y3) annual report, which seemed to reflect a growth mindset approach to their learning & teaching. I wanted to learn more about their thinking and where it came from.

Participants

Scholar	Details
1	Undergraduate physics 7-12 major; white male; graduated from the program in May 2024 w/2.90 GPA
2	Undergraduate math 7-12 major; Hispanic or Latino male; graduated from the program in May 2024 w/3.59 GPA
3	Undergraduate math 7-12 major; white female; graduated from the program in May 2024 w/3.81 GPA



Data Collection

- I conducted brief, semi-structured interviews with each Scholar over Zoom, after graduation (June 2024). Questions prompted Scholars to reflect on several quotes pulled from the evaluator’s report: describe what the ideas mean to them, consider where those ideas might come from, and hypothesize how similar ideas might be supported in students.
- Zoom interviews were recorded. Video files were uploaded to a private channel on YouTube for transcription assistance (using the closed captioning feature). I reviewed each transcript while listening to each interview to ensure accuracy, and made edits as needed.

Data Analysis

I employed thematic analysis to identify recurring themes and patterns in participants’ responses:

- Initial open coding of transcripts to identify participant-based themes
- Looked across participants to identify common patterns/themes occurring across at least two of the three participants

References

Dweck, C. S. (2006). *Mindset: The new psychology of success*. Random house.
 Good, C., Aronson, J., & Inzlicht, M. (2003). Improving Adolescents’ Standardized Test Performance: An Intervention to Reduce the Effects of Stereotype Threat. *Journal of Applied Developmental Psychology*, 24(6), 645-662.
 Haimovitz, K., & Dweck, C. S. (2017). The origins of children’s growth and fixed mindsets: New research and a new proposal. *Child development*, 88(6), 1849-1859.
 Yeager, D. S., Carroll, J. M., Buontempo, J., Cimpian, A., Woody, S., Crosnoe, R., ... & Dweck, C. S. (2022). Teacher mindsets help explain where a growth-mindset intervention does and doesn’t work. *Psychological Science*, 33(1), 18-32.
 Yeager, D. S., & Dweck, C. S. (2012). Mindsets that promote resilience: When students believe that personal characteristics can be developed. *Educational psychologist*, 47(4), 302-314.

Project URL

<https://www.southernct.edu/owlsteach>

