

NERDS!: Networking for Engagement and Re-Design in STEM Teaching

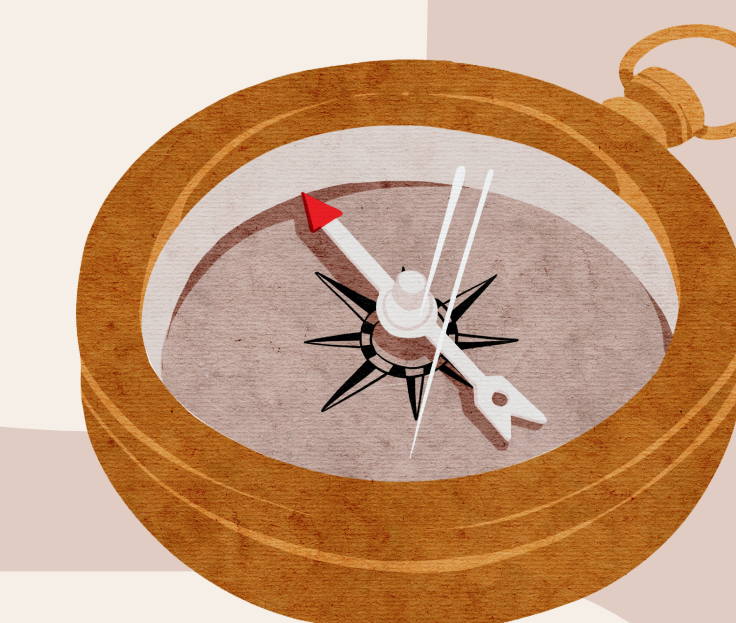
Emily M. Walter, Amy J. Ressler, & Alejandro Mendez
California State University, Fresno
California State University, Bakersfield

Research Question

How and in what ways was undergraduate students' learning affected by **storytelling assignments** and **applied improvisation experiences** in a general education biology course?

Objective

This study explores student outcomes in a general education biology course that implemented storytelling and applied improvisation games. These strategies were originally taught at an immersive faculty development experience called "NERDs" camp.



Context & Challenge

- Low **student persistence in STEM** is often linked to feelings of **isolation and a lack of community** in the classroom, particularly for historically marginalized and lower-income students (Estrada et al., 2016; Seymour & Hunter, 2019).
- Students who feel a sense of belonging and support in their classrooms are more likely to persist in STEM fields (Tinto, 2017).
- Creating a supportive classroom community direct impacts student success and retention in STEM (Estrada et al., 2016; Tinto, 2017).
- Faculty development programs that teach inclusivity and community-building strategies, like applied improvisation and storytelling, can improve classroom environments and student persistence (Rossing & Hoffmann-Longtin, 2016; Ressler, 2023).

What is NERDS camp?

2.5-day overnight camp & professional development workshop for STEM Faculty

Faculty learn applied improvisation & storytelling techniques

Created though collaboration between a Theatre Ed and STEM Ed Professor

Evidence for Approach

- **Immersive professional development (PD)** programs effectively improve teaching practices and student outcomes better than one-off workshops (Darling-Hammond et al., 2017; Opfer & Pedder, 2011)
- **Applied improvisation techniques** encourage faculty to take risks, adapt in real-time, and foster a growth mindset, this is linked to improved student engagement and more dynamic classroom environments (Rossing & Hoffmann-Longtin, 2016; Darling-Hammond et al., 2017).
- **Storytelling as a pedagogical tool** enhances emotional connection between instructors and students, improving communication and making complex STEM concepts more relatable and accessible (Abrahamson, 1998; Ressler, 2023).

Themes in Student Data

Written reflections from general education biology course (N=1245) at a minority-serving institution in the United States



First Person POV Created Connection to Material: **Personal connections and relevance to the individual's life were made through the storytelling assignments.**

- "The personal relevance of the assignment made it deeply meaningful to me."
- "The assignment deepened my personal connection to nature. There is so much out in our nature that we can explore if we want to."
- "I felt a personal sense of connection with the natural world."

Positive Struggle and Goal Setting [Delicious Fear]: **Storytelling assignments felt challenging but also safe and achievable.**

- "The difficulties encountered made the success more satisfying."
- "The assignment was hard, but I felt a sense of achievement in the end."
- "This assignment helped me define what I want to learn next."
- "The assignment encouraged me to set educational goals for myself."

Community Building / Mutual Care: **Applied Improvisation in class fostered positive feelings about class and new relationships with classmates.**

- "We had a lot of fun and learned together, which made us feel closer."
- "It was a shared experience that brought joy and bonding."
- "I felt happy to share my findings with my friends and see their reactions."

Discussion & Implications

Students felt personal connection to STEM in their everyday lives by completing storytelling assignments:

- Storytelling allows students to connect course concepts to their personal lives, thereby increasing engagement and a sense of belonging in STEM fields (Fredericks et al., 2004; Gay, 2002)

Postsecondary teaching should NOT be devoid of story, connection to people, and mutual care for one another.

- Engaging students through narratives and meaningful interactions supports a positive classroom environment and deepens learning outcomes (Floress et al., 2018; Reeve, 2012)

Go on a Quest!

Explore the STEM storytelling 'quest' assignments and our references for this study here.



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