EXPERIENTIAL LEARNING AND BUILDING COMMUNITY

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

<u>First Person POV Created Connection to Material:</u>
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."

<u>Positive Struggle and Goal Setting [Delicious Fear]:</u>
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."

<u>Community Building / Mutual Care:</u>
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.

We are grateful to the NSF for support this project #1928568