

Developing Teacher Professional Resilience Through Place Based Education and Mentoring

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Introduction

Project Goal: broaden participation of students in science, technology, engineering, and mathematics (STEM) by improving the STEM education workforce.

The US STEM workforce comprises only ~30% ethnic minorities and 26% women. Some students do not feel prepared or motivated to study STEM; others feel excluded and leave. Quality STEM teachers, particularly in high needs schools, can help to close these gaps. However, 17-50% of K-12 teachers leave within the first 5 years. This trend is exacerbated at high-needs schools (where > 50% of students qualify for free/reduced lunch).¹ Quality science teachers need both strong content and pedagogical knowledge, but this is not enough.

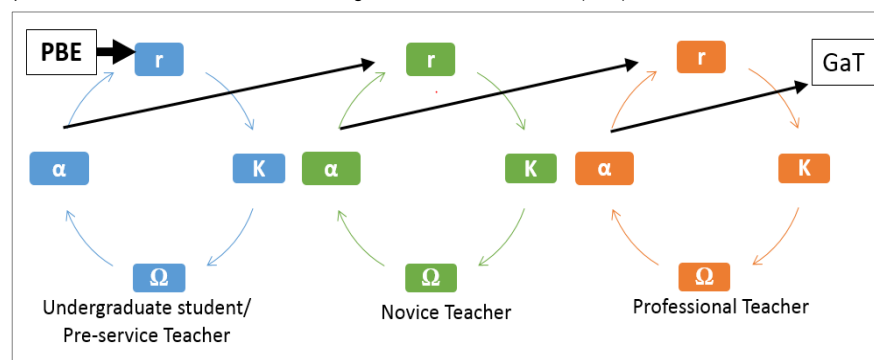
In this project we are studying how professional development in *place-based education (PBE)* paired with *mentoring* for early career STEM teachers:

- 1) supports teacher resilience and
- 2) is associated with STEM teacher retention and student achievement in high-needs school districts.

Place-Based Education

We will examine the interaction between mentors and Noyce teachers through using a social ecological systems (SES) framework. SESs are complex and adaptive, link the parts of the system through feedback mechanisms, and display resilience.² There are distinct phases of the adaptive cycle: growth/exploitation (r), maintenance/ conservation (K), disturbance/ collapse (Ω), and reorganization/ persistence (α). Resilience is the key to enhancing adaptive capacity leading to growth.³ Noyce teachers can feel connected to their new communities by developing and implementing PBE curricula⁴.

We posit that when K-12 STEM educators move through the distinct phases of the cycle, they develop professional resilience and demonstrate growth and transformation (GaT)⁵.



Predicted outcomes:

We predict the following:

1. Noyce Teachers who use PBE and find their own mentors will feel more connected to their local community and demonstrate strong adaptive capacity and professional resilience.
2. Students in these teachers' classrooms will demonstrate greater interests in STEM fields than non-PBE classroom students.



Intervention

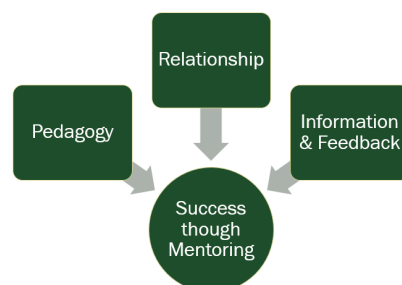
Noyce scholars are participating in workshops. They are learning about PBE (to discover their local environment, integrate voices of diverse stakeholders, and engage in eco-social justice).

Noyce scholars will also learn how to identify a "Resilience Mentor" in their new schools who will advise them on how to feel rooted in their new community. Workshops (and subsequent blogs during the first two years of teaching) will be designed and maintained.

The **final product of the project** will be a podcast, video, infographic, or web page by teachers describing both the socio-cultural and bio-physical systems supporting STEM resilience.

Mentoring

Teachers in high needs schools are more than twice as likely to leave the profession than those in low-poverty schools.⁶ As a result, these schools are more likely to hire novice or uncertified teachers to fill the need. It is critical to develop high quality models to support teacher success and retention in these schools. We surveyed our Noyce teachers (STEM Ed alums of CSU) in their first three years of teaching. Of 25 respondents, 23 received mentoring in their schools.



Noyce teachers indicated that when their mentor was caring and trustworthy, they felt that the relationship was encouraging and supportive. Additionally, mentors were seen as a source of pedagogical knowledge, system information, and low-stakes performance feedback. Most commonly (63% of survey participants) novice teachers were assigned mentors, but those who weren't, sought out mentors to help them be successful.

Tabitha N. on professional mentoring, "*Assignments were made in content areas if possible (since all math teachers were new that year, I had a science teacher as my mentor.)*"

Katie S. on place based mentoring, "*Part of a mentor's job is to help you understand the culture of the school.*"



References

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