

Adapting the TRU Framework: Tracking Changes in MGTAs' Instructional Practices

Engaged Learning, Inclusive Teaching, & Equity professional development

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Background

- Lecture-based teaching continues to dominate undergraduate mathematics, despite its negative impact on student success in STEM.
- Mathematics graduate teaching assistants (MGTAs) make up significant portion of the undergraduate teaching force.
- However, MGTAs are often not adequately prepared to teach in engaging, inclusive, and equitable ways.
- Without robust professional development (PD) for teaching that focuses on active, engaged teaching practices, MGTAs often replicate the lecture-based teaching practices that they have experienced.
- Consequently, the lecture-based teaching culture is perpetuated, and undergraduate students do not receive the benefits of evidence-based teaching.

Research Questions

RQ1. How does the ELITE PD program support MGTAs to transform their teaching practices to be more engaged, inclusive, and equitable?

RQ2. What are undergraduate students' experiences and perceptions of MGTAs' teaching practices and how do these change over time?

RQ3. How do the teaching practices of MGTAs in the ELITE PD program compare to MGTAs who do not participate in the program, both within the same graduate program as well at different institutions?

RQ4. What identifiable aspects of individual, institutional, and departmental cultures inhibit or support sustainable change?

Data & Methods

Classroom observations of MGTAs' teaching in their first year:

Pre-Fall	First-year Orientation	
Fall	Graduate Teaching Seminar	Obs 1
Spring	ELITE PD Intro to Active Learning and Equity	Obs 2 Obs 3

Theoretical Framework: TRU

The Mathematics

The extent to which the mathematics discussed in the observed lesson is **create and maintain an** focused and coherent, and to which connections between procedures, concepts and contexts (when appropriate) are addressed and explained.

Cognitive Demand

The extent to which classroom interactions environment of productive intellectual **challenge** that is conducive to students' mathematical development.

Access to **Mathematical Content**

The extent to which classroom activity structures invite and support the active engagement of all of the students in the classroom with the core mathematics being addressed by the class.

Agency, Authority, and Identity

The extent to which students have opportunities to conjecture, explain, make mathematical arguments, and build on one another's ideas, in ways that contribute to misunderstandings. students' development of agency, authority, and their identities as doers of mathematics

Uses of Assessment

The extent to which the teacher **solicits student** thinking and subsequent instruction response to those ideas, by **building** on productive beginnings or addressing emerging

The Mathematics

TRU

The focus is on the grade level the role of the teacher focused on supporting students exploring and justifying

ELITE PD

The focus is on a particular mathematics with mathematical idea or concept where the role of the role of the GTA is to support students exploring and justifying, with a focus on conceptual

TRU

Individual Work

Smal

Group

Work

understanding

The focus is on the designed lesson and materials.

ELITE PD

The focus is on the delivery of content rather than the structure of the designed lesson.

Cognitive Demand

TRU	ELITE PD
The focus is on the designed lesson and materials as well as the teacher interactions.	The focus is on the delivery of the lesson and materials as well as the GTA interactions.

TRU ELITE PD The focus is on The focus is on helping students the grade level mathematics and understand its development. concepts introduced.

Original TRU Framework



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Our Team



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Discussion

Why TRU?

- Captures aspects of equity and inclusivity not captured by other instruments, as well as identity and agency
- Other instruments did not capture the mathematics and the content element, nor did it capture the interactions between students.

What is different?

- TRU
 - Created for use in K-12 classrooms under Common Core
 - Focus is on the materials themselves in addition to the implementation of them
 - Teachers have more control over the materials they use in the classroom
 - Teachers are the ones introducing the topics and reinforcing them
- ELITE PD
 - Courses are focused on building on past material
 - Focus is on the facilitation of engagement with the prepared materials rather than the materials themselves
 - MGTAs often do not have control over the materials/activities used in their classrooms
 - Often, MGTAs are not introducing the topic to the students for the first time; rather they are reinforcing it

Observation 1

- The first observation of each MGTA indicates where they are in their teaching.
- Initial results indicate that there is room for growth for the MGTAs
- One particular area for growth is in their understanding of group work versus individual work

Future Work

- How do undergraduate student perceptions align with what the framework helps to capture?
 - If they do align, this is an opportunity to use these reports as a way to gauge what is happening in the classroom, which is more sustainable