Assessing Graduate Student Professional Development for Teaching: Needs and Progress With PAC-Math

Jack Bookman, Duke University
Emily Braley, Johns Hopkins University
Jeneva Clark, U. of Tennessee Knoxville

The Program Assessment Conference in Mathematics (PAC-Math, DUE# 2036211) was hosted in October 2023 at the University of Tennessee Knoxville. The conference produced key components to build a protocol for mathematics departments to self-assess their professional development for teaching provided to graduate students in mathematics. We describe previously presented results of a census survey of mathematics PhD programs conducted in Fall 2021 that reinforces the need in higher-ed mathematics for tools to do this assessment work, confirming results from a similar survey conducted in 2015. In this poster we outline the protocol, departmental resources needed to undertake this assessment work and questions of interest for the RUME community.

Keywords: Graduate Student Teaching Assistants, Professional Development, Program Assessment

Most PhD-granting mathematics departments provide Professional Development for Teaching (PDT) to Graduate student Teaching Assistants (GTAs) (Braley et al., 2023; Rasmussen et al., 2019). To sustain and improve these programs, departments and administrators need to be able to assess program effectiveness and establish assessment cycles that inform continuous improvement. From surveys conducted in 2015, in partnership between the CoMInDs project (NSF#1432381) and Progress Through Calculus project (NSF#1430540), and in 2021 by the CoMInDS project, we know that evaluation of GTA PDT has been extremely limited. For example, despite reservations of their validity, student evaluations of teaching are used as a primary evidence source to assess ongoing teacher training efforts (Braley et al., 2023; Speer et al., 2017). Survey respondents also indicated that tools for evaluation would be the one of the most valuable resources to help improve PDT programs.

The PAC-Math (Program Assessment Conference in Mathematics, DUE# 2036211) project aims to improve program assessment practices for PDT programs for GTAs in mathematics. PAC-Math convened a diverse group of experts and oriented them to (1) the current landscape of GTA PDT in PhD granting mathematics departments and (2) the need and desire in the mathematics community to assess PDT. In October 2023 PAC-Math participants met in-person to draft a flexible assessment protocol for self-assessment of PDT programs.

This poster will describe the background and evidence supporting the mathematics community's need for GTA PDT assessment tools or guides. It will provide an outline of the draft protocol developed through the work of the PAC-Math participants with a focus on stakeholders roles and needs, as well as the differing needs at various institutions. We invite the RUME community to scrutinize our results and make suggestions for improving the PAC-Math Protocol. We hope to recruit partners for future work in this area.

References

Braley, E., Bookman, J., Gehrtz, J & Speer, N. A Survey of Programs Preparing Graduate Students to Teach Undergraduate Mathematics. In Cook, S., Katz, B. & Moore-Russo, D. (Eds.) (2023). *Proceedings of the 25th Annual Conference on Research in Undergraduate Mathematics Education*. Omaha, NE.

Rasmussen, C., Apkarian, N., Hagman, J. E., Johnson, E., Larsen, S., & Bressoud, D. (2019). Characteristics of precalculus through calculus 2 programs: Insights from a national census survey. *Journal for Research in Mathematics Education*, *50*(1), 98-111.

Speer, N., Ellis, J., & Deshler, J. Evaluation of Graduate Student Professional Development and Instruction by Mathematics Departments: Results from a National Survey. In A. Weinberg, C. Rasmussen, J. Rabin, M. Wawro, & S. Brown (Eds.) (2017). *Proceedings of the 20th Annual Conference on Research in Undergraduate Mathematics Education*. San Diego, California.

PAC MATH

Ready!

ONCE UPON A TIME

- What preparation would Math Departments do before evaluating their GTA PDT programs?
- How would they identify goals?
- What tools, such as logic models or key performance indicators, could help the evaluation planning process?
- Would it help to describe the history of and current state of the program?

THE PLOT

- What data could be collected?
- What are pros and cons for types of data collection?
- Who are the stakeholders and what would each of the stakeholders consider as evidence of success?
- How does data collection reflect the voices and interests of stakeholders?
- What analyses can be done?

PAC MATH

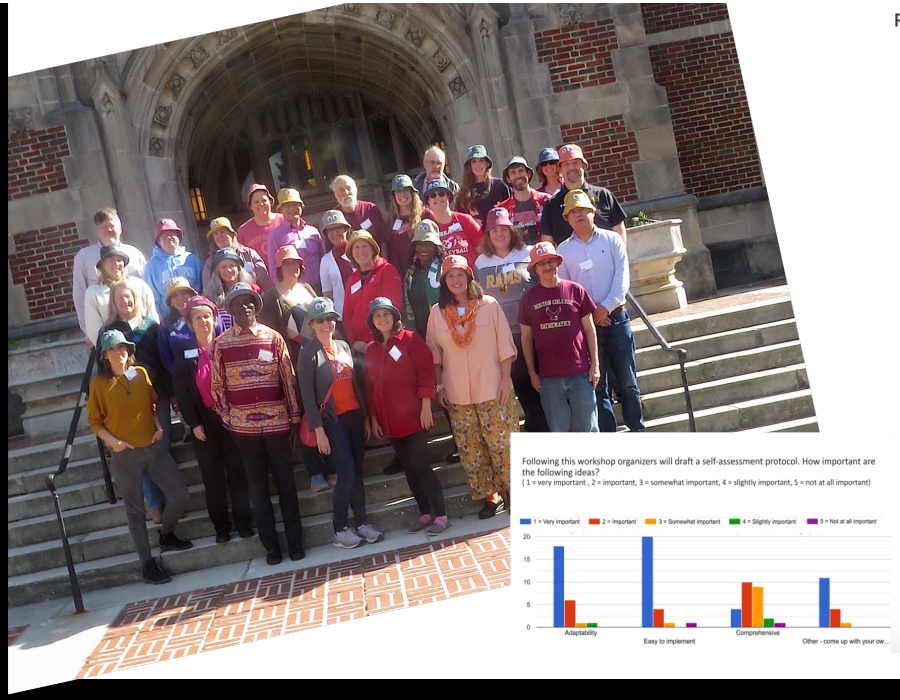
MORAL OF THE STORY

- What form should results take?
- How are results communicated?
- How should stakeholders' responses to results be reflected in reporting?
- How do stakeholders provide feedback to drive continuous improvement and positive change?
- How can the assessment cycle be continued and connected to the broader missions?

Game Not Over!

PAC MATH

SCAN ME



PAC-Math Protocol

- Introduction & Inspiration
- Big Picture: Assessment
  - Data from Workshop
- Who are the People? Stakeh...
  - Data from workshop
- Program Description
  - Data from Workshop
- Goals Story
- Methods
  - Alignment of Data to Goals
    - Data from Workshop
  - Data Collection Plan
    - Data from Workshop
- Primary Results
- Secondary Results

CORNELL UNIVERSITY FOUNDED A.D. 1865

Duke

APPSTATE 125

PILOT DEPARTMENTS

UCONN

CLEMSON UNIVERSITY

h in Undergraduate Mathematics

N