

Examining a GTA's Knowledge for Teaching Statistics via Scripting Tasks

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According to the Conference Board on Mathematical Sciences survey in the Fall of 2021, approximately 1 in 4 (24%) introductory statistics instructors in statistics departments at 4-year institutions were graduate teaching assistants (Blair & Kirkman, 2025). Despite reliance on graduate teaching assistants (GTAs) in providing introductory statistics instruction for undergraduates at a time where data science and statistics programs are growing in popularity, research into statistics GTAs' knowledge for teaching is sparse. Previous work highlights GTAs' desire for support in multiple areas including technology, content, and pedagogical practices (Green, 2010) and an inconsistency in preparation for GTAs' across institutions (Justice et al., 2017). This leaves many GTAs to construct their knowledge and beliefs about teaching statistics independently which may result in their practice being rooted in their own classroom experiences and beliefs rather than recommended educational practices.

We conceptualize knowledge for teaching statistics using aspects of the Technological, Pedagogical, and Content Knowledge model (TPACK; Mishra & Koehler, 2006), Ball et al.'s (2008) domains of mathematical knowledge for teaching, and Groth's (2007) model of statistical knowledge for teaching. In this way, we draw upon the important aspect of technological knowledge in the realm of statistics while also utilizing Ball et al.'s subcategorizations of content and pedagogical-content knowledge in our exploration of GTAs knowledge for teaching statistics. The incorporation of Groth's model of statistical knowledge for teaching allows us to explore some of the non-mathematical aspects of knowledge for teaching statistics which differ from knowledge for teaching mathematics. In this poster, we aim to show how the use of scripting tasks allows us to explore GTAs' knowledge for teaching and how their knowledge may affect their pedagogical decisions, which may position them as helpful activities for use in the preparation of GTAs to be statistics educators.

In this project, five GTAs participated in a two-part sequence of one-on-one interviews centered around a scripting task. Scripting tasks (Crespo, 2018) are a type of activity designed to engage future educators in thinking about the process of teaching by providing a hypothetical, written scenario and asking them to continue the scenario in a script format where they control all actors in the scene. Our scripting task modeled a discussion between the GTA and two students while working on an activity exploring bootstrapping and confidence intervals in the large-enrollment introductory statistics course at the GTAs' home institution. In their first interview, each GTA was asked to "prepare for class" by reviewing the activity students would be working on in their hypothetical class. Then, they were given the scripting task and asked to continue the script, talking aloud about their decision-making process. For their second interview, GTAs' worked through a set of alternative scenarios based on their original script that were designed to present common alternative conceptions students may have in the context of the activity, again discussing their thought process and decision making.

This poster will focus on the interviews with one GTA, Norman, with a focus on identifying areas where aspects of his knowledge for teaching statistics were made visible through the use of the scripting task. Additionally, we'll discuss the potential of scripting tasks for engaging GTAs in thinking about students' alternative conceptions in statistics.

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