

ABSTRACT

As a young and dynamically evolving discipline, statistics evokes many conceptions about its purpose, the nature of its development, and the tools and mindset needed to engage in statistical work. While much research documents the perceptions of statisticians on these matters, little is known about how the disciplinary perspectives of statistics instructors may interact with the work of teaching. Such connections are likely relevant since research has shown that teachers' and instructors' views about the discipline they teach inform their instructional approaches. This work specifically focuses on the disciplinary views of graduate teaching assistants (GTAs), who continue to serve a critical role in undergraduate instruction. Using multiple case study design, I document the views, experiences, and teaching practices of four statistics GTAs over the course of a full year—from their induction into the department in the fall, until their first solo-teaching opportunity the following summer.

From the literature, I organized important disciplinary themes in statistics, including disciplinary purpose, epistemology, and disciplinary engagement. Targeting issues and questions stemming from these areas, I documented the various perspectives, models, and tensions that characterized the disciplinary views of the participants. I also documented the relevant experiences and influences that motivated these views. Additionally, I explored the GTAs' pedagogical views and vision for teaching introductory statistics while looking for possible connections (and glaring disconnects) between these views and their disciplinary views. Finally, I observed their instruction and considered the participants' teaching reflections as I looked for alignment between their expressed views and actual instructional decisions.

My analysis revealed that several of the GTAs expressed sophisticated views and expert notions about the discipline. There was, however, a clear disconnect between their perceptions of

disciplinary work and the work of students in an introductory statistics course. Despite recognition that statistical questions typically do not have right answers, that statistical methods are often quite flexible and contextually-driven, or that many disciplinary elements developed through community negotiation rather than discovery, the GTAs struggled to bridge these considerations to the tasks being posed and the practices being emphasized in introductory courses. The participants also expressed a basic desire to engage students in practice problems and activities, yet their instructional visions were not specific and well-grounded in rich classroom experiences that modeled student-centered pedagogy. As a result, all four GTAs converged on a singular vision for introductory statistics. This vision involved focusing on “the basics,” acquainting students with a wide array of procedures, honing students’ computational abilities, and emphasizing statistical problem-solving as a pursuit for right answers.

This dissertation study provides insights into disciplinary tensions that may be of value in developing an instrument for assessing the disciplinary views of instructors and students alike. GTAs without well-developed views may need opportunity to engage in rich, open-ended tasks that serve to develop their disciplinary perspectives. Additionally, this work reveals how GTAs may struggle to bridge their perceptions of advanced disciplinary work to the work of their own students. Acquaintance and experience engaging in tasks that promote informal inferential reasoning or exploratory data analysis, coupled with connections to situated and constructivist learning theories, may enrich GTAs’ instructional visions as they see how disciplinary and instructional spaces may interact and inform one another.