

ABSTRACT

NINA G. BAILEY. Describing Critical Statistical Literacy Habits of Mind. (Under the direction of DR. ALLISON W. MCCULLOCH)

This dissertation adopted the three-article format. The entire dissertation aims to explore Describing Critical Statistical Literacy Habits of Mind (CSLHM). The first article describes the creation of the CSLHM framework. The second describes how secondary preservice mathematics teachers enact CSLHM. The third article describes a common and an unusual case of secondary preservice mathematics teachers' CSLHM enactment. Below is an abstract for each of the three articles.

The first article presents the CSLHM framework. Given the vast number of data representations that people encounter daily, it is imperative that people become critical consumers of the representations they will face. This requires the development of particular habits of mind. The purpose of this paper is to share the critical statistical literacy habits of mind framework. We articulate how we drew on the literature related to statistical literacy, critical mathematics, and critical statistical literacy to identify the habits of mind needed to enact critical statistical literacy in the context of consuming data representations. We describe the refinement process using qualitative interview data. To illustrate what each of the critical statistical literacy habits of mind looks like when enacted, we share examples from statistics teachers making sense of a data representation.

The second article aims to explore how preservice secondary (middle and high school) mathematics teachers (PSTs) enact critical statistical literacy habits of mind when engaging with a statistical message from the media. Standards documents (e.g., National Governors Association Center for Best Practice & Council of Chief State School Officers, 2010; North Carolina Department of Public Instruction, 2020) emphasize statistical literacy from the consumer orientation (e.g., making sense of data representations from the real world). Making sense of real world statistical messages requires the adoption of a critical lens (e.g., focus on power and equity). How statistics are wielded and presented in the real world cannot be separated from the fact that social issues operate within systems of marginalization, privilege, and power. Findings reveal that preservice teachers emergently enacted the CSLHM, and some enacted particular CSLHM robustly.

The third article describes a common and an unusual case of secondary preservice mathematics teachers' CSLHM enactment. When making sense of data representations from the media, preservice secondary mathematics teachers typically enact CSLHM emergently. The goal of this study is to examine the ways that PSTs enact CSLHM when making sense of data representations from the media using an instrumental multiple case study design. Two cases were selected from the broader study, one typical CSLHM enactment and the other unusual. The study examined how each enact the CSLHM across two tasks and examined the differences between the two cases. Findings revealed several important differences between the cases. The PST who more robustly enacted the CSLHM integrated context into her enactment, directly discussed the social issue, and evidenced elevation of some CSLHM from emergent to robust on a single task. These findings are important for the field to consider how to support preservice teachers CSLHM development so that they can help their students develop the same habits of mind.

Keywords: critical statistical literacy, habits of mind, preservice mathematics teachers