AN EXPLORATORY STUDY INVESTIGATING RESEARCHERS' PRODUCTIVE STRUGGLE CONCEPTUALIZATIONS IN TWO DISTINCT CONTEXTS

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Identifying key features of *productive struggle* helps build a common language and shared understanding of this term across conducting research and enacting the National Council of Teachers of Mathematics' (NCTM, 2014) teaching practice "[supporting] productive struggle in learning mathematics" (p. 10). However, productive struggle is a complex phenomenon. One way to better understand this phenomenon is by investigating how different researchers conceptualize productive struggle, such as by depicting it through the figures in their published papers. Thus I investigated the research question: *What do researchers' conceptualizations of productive struggle in distinct contexts reveal about key features of productive struggle?*

This exploratory study emerged from a larger ongoing study that investigates the definitions of productive struggle (e.g., Kamlue & Van Zoest, in press). As I analyzed studies that investigated productive struggle, I noticed that Warshauer's (2015) study [W15] and Granberg's (2016) study [G16] had several key differences, including interaction opportunities, mathematics content, and study foci. For example, in W15, students had opportunities to work individually, in a small group, or as a whole class, and the students received support from their teachers. In contrast, students in G16 worked in pairs and received automatic feedback from GeoGebra software. Moreover, while G16 used linear function problems for upper secondary school students in her study, W15 used proportional reasoning for middle school students. I also noticed that while G16 focused on the problem-solving process (e.g., correcting prior knowledge), W15 focused on classroom interactions (e.g., teacher-student interactions).

Since these two authors investigated the productive struggle construct through different lenses (e.g., different study foci), I analyzed these two articles, particularly focusing on the depictions in their figures as a proxy of their conceptualizations, to identify commonalities in their approaches. I analyzed the two articles using the four dimensions (*tasks*, *student struggles*, *teacher responses*, and *outcomes*) that were identified in W15's *productive struggle framework* (p. 391) as a starting point to investigate how G16 aligned with or differed on those four dimensions. Then, I discussed the initial findings with other researchers to confirm or disconfirm the findings.

The initial results indicated at least three commonalities between how W15 and G16 conceptualized productive struggle in learning mathematics that can inform future work on productive struggle. First, tasks that are unfamiliar to the students promote productive struggle. Second, struggles that tended to be productive concerned important mathematics (e.g., *error concerning prior knowledge* (Granberg, 2016, p. 39), not *error due to carelessness* (Warshauer, 2015, p. 386)). Finally, student responses to the feedback they receive emerged as important, regardless of the form of the feedback (e.g., teacher responses, automatic feedback from GeoGebra, peer responses). This poster will illustrate my analysis of these studies and elaborate on how my results can inform future research into productive struggle.

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