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## Introduction

A solution for teachers to create a better environment for their students and for students to increase their knowledge most proficiently is by teachers participating in professional development (PD) experiences (e.g., workshops, summer institutes, etc.). A few of the common topics that are the focus of PD for science teachers are sensemaking (Brown, Bybee 2023), how science should sound and what it should look like (Renfrew 2023), and how teacher talk can support students in these activities (Wray et al., 2022). It is essential for teachers to recognize that students are inherently curious individuals and that by leveraging this quality, they may contribute to their own success and that of their peers and decrease the misconception that children are not scientific thinkers. While teachers engage in PD they may also where different "hats" or positioned in different roles that support their goals of sense making in their own science classroom through engagement in tasks "like a student" and "like a teacher" (Lowell, 2024).

## Methods

- This study is situated within a larger professional development project focused facilitating productive science talk in 6-12 science classrooms.
- Tina and Renee both participated in the professional development (PD) in the summer of 2019.
- A focus on day 1 of their on their summer professional development experiences where Tina and Renee engaged in a task centered on figuring out the pattern of Venezuelan guppies as part of a CER task on natural and sexual selection.
- Coding the video and audio data consisted of tagging interesting moments on when and how the teachers were using their different hats to engage in the lesson.


## Results

After exploring footage of teachers during professional development we have categorized two frames that teachers take up in their roles during professional development. The first frame they take up is what the literature refers to as *teacher hat*. This frame is where teachers are situated to ask questions and think with the thought process of a teacher, questioning instructional strategies and pedagogy. The second frame they take up is the *student hat*. In this frame, teachers engage in analyzing and articulating ideas as they sensemake in the position of a student.


## Conclusion

Teachers engage in these two frames or *hats* during the PD task to understand better and communicate within their classrooms. In this study, Tina and Renee even when prompted to engage in the task with their *student hat*, continually return to *teacher hat* as they think about how their students would wrestle with "figuring out" the explanations for the task. We acknowledge that teachers use these *hats* for a specific reason. While we do not have a summative explanation for all the uses of these two frames, it is within these frames that we think teachers gain an increased understanding necessary for facilitating and communicating tasks with students within the classroom.


## Research Question: What frames do science teachers take up when engaging in professional development activities?



**Tina to her group:** A lot of relationships we could look in here [in the data set], but we're answering the one question. I feel this is one of my students' challenges. There's a lot of data that you can balance. Lot of questions could be asked.



**Renee to her group:** Um, when I'm thinking about diversity, as my student, I'm thinking that they are bright, but they may have a variety of patterns within that brightness. Um, so all we really know is bright or not bright, right? So, you're right, we don't have data related to diversity. Um, so that it's an extrapolation that was not appropriate.



**Renee to a Facilitator:** Um, so we are just, I think we feel fairly confident asserting that there's a causal relationship between the presence of credits and the diversity or the coloration of, um, males in Okay. And the number of individuals in the pool, obviously. Okay. So and with more numbers you have more diversity because there's um, any replication. Okay. And I'm not close <laugh>, so, but that's a link. Um, we feel fairly certain that the turbidity is not a significant variable, um, nor the distance from the river. Um, because the presence of the predators. Okay.

## Select References

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