

An Assessment Focused Research-Practice Partnership

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Abstract: In this proposal we present a narrative account of a research-practice partnership focused on creating an assessment that could meet the needs of teachers as an activity they could enact to support their instruction and assessment goals and also meet the needs of researchers as a research measure. We highlight the way the Draw-A-Scientist Task (DAST), a tool for revealing students' images of scientists, was introduced at a teacher professional development institute and adopted by middle school science teachers. By following a co-design approach, we created a strong research-practice partnership. Our findings summarize the nature of the research-practice partnership and outcomes. This work is a critical illustration of the importance of considering teachers as true research partners. This collaboration afforded the development of a tool that they could use to elicit students' ideas about science and also reveal some of their personal identities.

Keywords: Professional Development, Teaching

Introduction and theoretical frameworks

Introduction

This paper describes a research-practice partnership where teachers and researchers co-edited the Draw-a-Scientist task to measure middle school students' identity using the Draw-a-Scientist Task (DAST) (Chambers, 1983). The DAST is designed to measure students' perceptions of scientists and their ideas about the nature of science. In the current work, teachers and researchers worked together across two years to modify and enact the Draw-a-Scientist task for use in middle school science classrooms.

This work builds on the rich history of research-practice partnerships in the learning sciences (Penuel & Gallagher, 2017). The research question driving this work is "What are the outcomes for teachers and researchers who are involved in a research-practice partnership focused on co-creating a student-centered assessment?" Our narrative description of the work provides an account of how teachers and researchers worked together to build trust and create a tool that was beneficial for instruction as well as research.

The Co-Design Process

The co-design process we engaged in aligns with the definition of co-design as a collaborative process involving teachers and researchers/developers working together to create an educational tool by engaging in iterative cycles of design, enactment, and evaluation (Penuel, Rochelle, & Shechtman, 2007). Typically, co-design research focuses on developing new technologies that are classroom innovations. This work is unique because it invites teachers to co-design a paper-and-pencil based assessment as a classroom "innovation".

Methodology

Research Context

Our research took place across two years as part of a larger project being enacted in four middle schools with diverse students and families from rural, suburban and urban communities. In this study we focus on the teachers across two academic years and summers. They participated in summer professional development meetings to learn about the social learning environment, Flipgrid (Flipgrid.com). At these meetings they were also introduced to approaches to create culturally responsive learning experiences that invite students and parents to make connections between their everyday lives and the science being covered in their classes. A major facet of our research is to measure students' science identity. This paper focuses on our effort to include teachers as collaborators in this particular aspect of the project. We selected the draw-a-scientist task to measure student identity and included teachers as partners to modify the task to fit their instruction needs as the researchers also considered how it would meet their research goals.

Data Sources

Teacher focus groups were conducted at the end of each summer professional development (PD) institute. Follow-up focus groups were hosted during the academic year. Individual teacher interviews were conducted at the end of each academic year.

Findings

The co-design process: Modifying the DAST

Our collaboration centered on a desire to make sure that the task would be developmentally appropriate, culturally responsive, and gave us insights into students' identities. Teachers were able to create instructions and versions of the task that were most appropriate for their classes. Some also included reflection questions to elicit details about students' drawings and to prompt them to further reflect on their STEM identities and interests in STEM careers. During the year two professional development meeting, teachers collaborated to create a single approach for administering the task and standardized the reflection questions.

The redesigned DAST in action: Research and pedagogical goals

During both professional development meetings, teachers and researchers agreed on the need to better understand students' science identities. Working together, they were able to co-design a tool, the modified DAST that met multiple goals. In Year 1, although teachers administered four different versions of the task, they eventually agreed that one standardized version, along with a reflection question worksheet one teacher created, would be more appropriate for their students as well as provide more information about how students' are situating their own science identities with the images of scientists they drew.

The impact for professional development: Shared goals and trust building

Co-designing the modified DAST helped the research team to understand teachers' goals of developing something that would serve as a class activity as well as a measurement tool. In most cases, their priority was providing students with an opportunity to share their ideas and reflect on their identities. Some teachers used the task as a graded homework assignment and others presented it as a way to get to know their students.

Teachers and researchers discussed the way that the instrument would be introduced, and modified the reflection questions together. To further meet the needs of the researchers, teachers agreed to administer the instrument to their students during a particular week of the fall semester.

Discussion

Our partnership illustrates the power of a relationship built based on a shared goal of eliciting students' ideas about science and also reveal some of their personal identities. Teachers are being asked to make evidence based decisions at the same time as researchers are being asked to develop authentic assessments to measure the impact of interventions that affect difficult to measure constructs such as identity. Co-design activities can serve practical goals to create useful tools. During the co-design process, teachers and researchers can develop critical relationships that advance research and enhance pedagogy.

References

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