
Examining Equitable Participation in a Professional Learning Community using the EQUIP Tool

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Abstract

This paper presents an analysis of how prospective secondary mathematics teachers (PSTs) examined and reflected on equitable participation in their mathematics classrooms. Data comes from an assignment in which PSTs used the EQUIP tool (Reinholz & Shah, 2018) to collect, analyze, share, and reflect on data from their practicum classrooms. Results indicated that PSTs saw benefits of the assignment including how the EQUIP allowed them to examine patterns of equitable participation, but they struggled to use the tool and to notice or suggest action steps related to the demographics of their classrooms. Implications for how the assignment can be improved to more effectively engage students in being more critical noticers are discussed.

Background

According to the Association of Mathematics Teacher Educators (AMTE; 2017), “Ensuring the success of each and every learner requires a deep, integrated focus on equity in every program that prepares teachers of mathematics” (p. 1). Males, Sears, and Lawler (2020) describe how the preparation of secondary mathematics teachers currently “does not adequately attend to societal inequities and injustices” (p. 60). The authors stress the need for teacher preparation programs to prepare prospective secondary mathematics teachers (PSTs) to attend to equity and social justice issues. One critical area of work is developing resources and assignments to engage PSTs in analyzing their instructional practices. The EQUIP tool (Reinholz & Shah, 2018) was developed for teachers to collect and analyze participation. It “focuses on relatively low-inference dimensions of classroom discourse, which are cross-tabulated with demographic markers such as gender and race to identify patterns of more and less equitable participation within and across lessons” (Reinholz & Shah, p. 140). Preparation programs can use tools like this alongside qualitative approaches to support PSTs in noticing inequitable practices and to support them in providing better opportunities for students.

As mathematics teacher educators, we work to expose our PSTs to tools such as the EQUIP and to create assignments and experiences for our PSTs to attend to equity and social justice issues. In this paper, we describe an assignment that engaged our PSTs in analyzing, sharing, reflecting on, and making a plan to improve the opportunities they provide for equitable participation in their classrooms. In addition, we provide an analysis of the assignment by focusing on the following research questions:

1. What did PSTs attend to when analyzing opportunities for and generating action steps to improve opportunities for equitable participation in their classrooms?
2. What benefits and challenges of the assignment did PSTs name?

Methods

Context, Participants, and the Assignment

PSTs completed the assignment in the second of two teaching methods courses in an initial Grades 6–12 mathematics certification program taught by the second author. There were 18 PSTs enrolled in the course and an associated practicum that they attended every day in a middle or high school mathematics classroom. Thirteen students identified as males, and six identified as females. No males identified as a student of color, while three females identified as students of color. PSTs collected the data for this assignment in their practicum classrooms.

This assignment was one of the assignments we asked PSTs to complete to address issues of access and equity emphasized in Candidate C.4 and interwoven throughout the standards. Although we did not use the language Plan-Do-Study-Act (PDSA) explicitly with our PSTs, we engaged them in PDSA cycles (see Figure 1).

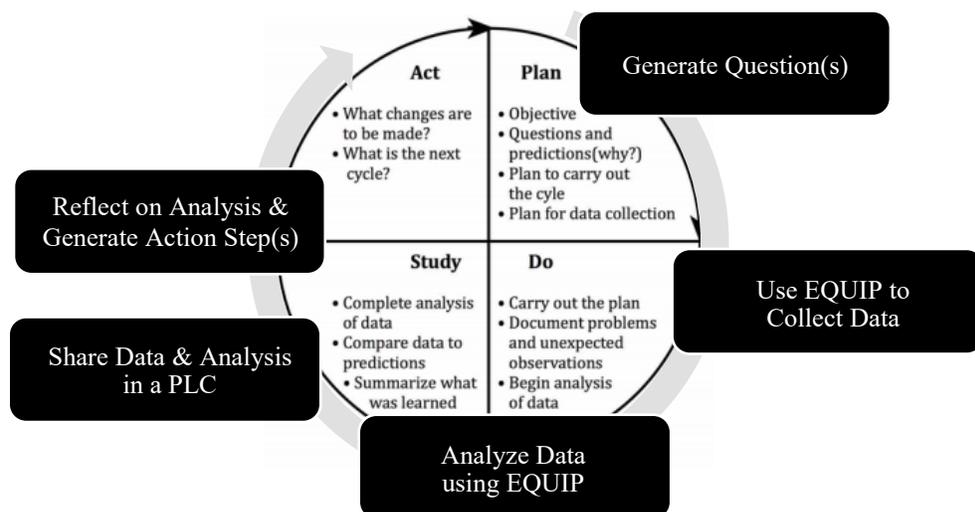


Figure 1. Components of assignment mapped onto Martin & Gobstein's (2018) PDSA cycle structure.

We asked PSTs to: (a) generate a question or questions to examine equitable participation, (b) use the EQUIP tool to collect data from 20 minutes of instruction, (c) analyze the data, (d) share data and analysis in a professional learning community (PLC) in methods, and (e) write a reflection (in October and December) that described steps for improving participation in their classroom.

Data Collection and Analysis

We collected data in the form of two written reflections and written responses to an evaluation of the assignment. To analyze the data we individually read each reflection and took notes. We then organized the data into a spreadsheet with one row for each PST and columns labeled "Analysis Attention and Codes" and "Action Steps and Codes." The second author placed each PST's question or focus, as written, for each cycle, in a column called "Question/Focus." The first author then placed the words written by the PSTs in their reflection for each cycle, related to their analysis, as well as words related to any action steps they proposed in their respective Attention columns. We then collaboratively coded each PST's Analysis Attention and Action Steps Attention. We used the EQUIP demographics (e.g., race, gender) and discourse dimensions (e.g., teacher solicitation, wait time, solicitation methods, length of talk, student talk), while also being open to generating codes not captured explicitly

by demographics or the discourse dimensions available in EQUIP. One such code we decided to create was general practices, which captured aspects such as participation structures, roles, classrooms norm, and timing.

Results and Discussion

The Focus of PSTs Analysis and Action Steps

Table 1 illustrates the total number of each of our assigned codes across all PSTs.

Table 1

Number of Codes Assigned by Discourse Dimension and Demographic Category

	Attended to in Analysis					Attended to in Action Steps				
	Race	Gender	SpEd	ELL	None	Race	Gender	SpEd	ELL	None
Teacher Solicitation		1	1		2		1			6
Wait Time		2			1		3			
Solicitation Methods	2	5	1		6	1	3		1	10
Length of Talk			1		1					1
Student Talk	1	7		1			1			1
Number of Students			1		2					
General Practices					1				4	14

When analyzing, PSTs more frequently attended to solicitation methods and student talk, but did not often consider demographics. When they were considered, gender was the most frequently discussed demographic. PSTs rarely attended to race. When generating action steps, PSTs attended most frequently to general practices and solicitation methods and, once again, did not often address demographic information. Some PSTs mentioned gender and one PST discussed race, stating he needed to call on students “more evenly in terms of race and gender.”

Looking across PSTs’ analysis and action steps, we noticed that PSTs did not often align their action steps with their analysis. For example, those that mentioned something about the participation of special education students in their analysis did not mention special education students in their action steps. In addition, while we only coded one statement as general practices in PSTs’ analysis, we coded 18 statements as general practices when attending to action steps.

Benefits and Challenges of the Assignment

PSTs named numerous benefits of the assignment. First, PSTs said the assignment supported their noticing of patterns related to equitable participation including revealing areas of needed improvement with respect to demographic factors such as gender and race. Second, PSTs mentioned that the EQUIP tool allowed them to track participation and provided specific details such as the equity score and reports that could support

their improvement in areas that they felt uncomfortable with. Finally, PSTs also mentioned general benefits, such as the usefulness of analyzing video and being able to learn from one's practice and from others in the PLC.

PSTs also named challenges. First, they had difficulties setting up and using the EQUIP tool, especially the first time they used it. Second, they had challenges designing their studies, with some students mentioning the difficulty they had generating a question or identifying a question that they could actually investigate by collecting data. PSTs also had difficulties deciding what data to collect and deciding how this data would contribute to answering their question(s). Finally, they described data collection difficulties including logging contributions while watching their video, classifying student talk, and general video issues (e.g., visibility).

Summary and Next Steps

In summary, PSTs did see the benefits of the assignment including how it allowed them to examine patterns of equitable participation, but also had difficulties designing their study and using the EQUIP tool, especially at first. In addition, while PSTs were able to analyze their data and describe action steps, these did not often attend to the specific demographics of their practicum classrooms. PSTs also attended more to teacher-focused rather than student-focused dimensions (e.g., teacher solicitation, solicitation methods, instructional practices).

To support PSTs in focusing more on equitable participation by considering the specific students in their classrooms, we could require students to practice generating research questions and ask that these questions attend more explicitly to demographics. In addition, we can spend time discussing data collection methods and practice logging contributions together on the same video. To generate more critical noticers, we may also engage students in more than two cycles and during these cycles specify particular discourse dimensions, such as the more student-focused ones, and particular demographics such as race.

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