

PeerTeach:

Creating Learning Communities where Every Student is a (good) Teacher

Final Report for the Amir Lopatin Fellowship

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In traditional math classrooms, teachers lecture and students take notes. Learning is passive as teachers do the intellectual work and students repeat what they see. While traditional math represents the status quo in classrooms (Boaler & Sengupta-Irving, 2016), teachers are increasingly implementing reform teaching strategies, which elevate student reasoning, discussion, and collaboration. Reform-minded teachers encourage students to reason through math problems collectively, extending and evaluating each other's thinking. However, students do not naturally use the most effective discourse tools for accomplishing these goals (Roscoe & Chi, 2007). Those who have witnessed peer-to-peer teaching should be familiar with the typical ritual: "This is how you do it... do you get it?" ... head nod from learner... move on. In a world where student discourse is increasingly the vehicle for student learning, it is critical that we give students tools to engage effectively with each other's thinking.

I designed the PeerTeach web application to train students to use proven discourse tools to support the learning of their peers. With this application, I aim to train students to perform dialogic teaching, which has been shown to improve student persistence, math interest, and achievement when enacted by adult teachers (Boaler & Staples, 2008). In this paper, I provide a rationale for why it is so critical to train students to teach each other better, how my intervention aims to accomplish that, and the results of an initial pilot study.

Brief Background on Peer Tutoring Literature

Peer tutoring—one type of peer assisted learning—has been found to increase learning for both tutors and tutees (see meta-analyses such as Cohen, 1982; Leung, 2014; and Bowman-Perrott et al., 2015). In fact, in their meta-analysis of 19 studies involving students with learning disabilities, Bowman-Perrott et al. (2015) found that students with emotional and behavioral disorders – a group of students particularly underserved in schools – experienced particularly high academic gains when acting as both tutors and tutees. What is more, the benefits of peer tutoring extend beyond academic achievement. Tutors and tutees develop more positive attitudes toward subject matter (Cohen, 1982) and tutors experience improved conceptual understanding (Benware & Deci, 1984). These findings are consistent among low achieving (Allen & Feldman, 1976) and special education students (Mathes & Fuchs, 1994).

While the impacts of peer tutoring are typically positive, the magnitude of learning gains spurred by peer tutoring have been "underwhelming," according to Roscoe and Chi (p. 534, 2007), who believe that tutors' behaviors serve a critical role in determining learning gains. Unfortunately, however, few studies have thoroughly examined peer tutors' behaviors (Berghmans et al., 2013). The small number of studies aiming to characterize peer tutors have found that tutors tend to do much more explaining than tutees (King, 1997), place minimal demand on tutees when questioning (Graesser et al., 1995), and rarely stimulate deep-level reasoning or do much to monitor the understanding of tutees (Graesser et al. 1995; Roscoe and Chi 2007). While schools of education generally favor student-centered learning, peer tutors

almost universally orient toward didactic tutor-centered learning. They do not encourage the sense-making of tutees, nor are they responsive to their confusions and needs (Chi et al. 2001). And if peer tutoring has proven effective despite the use of poor teaching strategies, imagine the potential learning that could result from tutors using favorable strategies.

So, have researchers attempted to train students to use more favorable tutoring strategies? Yes, but only a few, and nearly exclusively at the collegiate level. One important study among these involved training advanced college students to use facilitative tutoring techniques with small groups of freshmen in a compulsory math class (Berghmans et al., 2013). The formal training lasted 90 minutes, involving an overview on facilitative strategies (mainly questioning and hinting ones) and opportunity for tutoring roleplay with feedback. The research team then analyzed the instructional moves used by tutors and interviewed them to better understand the rationales for their decisions. In line with past findings and despite the preparation to be more facilitative, tutors were inevitably inclined toward answering and directive strategies, primarily knowledge-telling, and their questioning was “low level and shallow” (p. 717). The authors conclude that novice tutors require extensive training on deep-level questioning, working with tutees of varying levels, and reshaping beliefs about learning. These conclusions were a driving force in the design of the study described in this report.

Peer tutoring is not an explicit goal of reform math, but it has the potential to serve as a powerful mechanism for accomplishing its aims: to make students active, collaborative learners who gain deep, conceptual understandings. This, of course, can only be accomplished if student tutors take on behaviors consistent with reform math pedagogy. As the study above suggests, students (not unlike many teachers) struggle to make this transition. The aim of this research project is to discover ways to train students to be thoughtful teachers capable of eliciting, probing, and guiding the thinking of their peers in much the same way that effective reform math teachers do.

My Approach to Training Peer Tutors

The end goal of this project is to cultivate educational spaces where students converse in ways that support and improve each other’s learning. There is value in training students to better collaborate with each other in moments of shared confusion or equal understanding. There is also value in training students to support others effectively in moments of dichotomous understanding; I call this peer tutoring. While the intervention at the center of this project will hopefully lead to better collaboration between students with shared confusion or equal understanding, it most precisely targets situations of dichotomous understanding where one student attempts to help another learn. This is in part because peer-to-peer teaching is wrought with didactic, unresponsive behaviors and is generally understudied. This is also because one-on-

one tutoring interactions are easier to measure, both in terms of tutor behaviors and tutee learning.

First, what do I mean by peer tutoring? In this report, I use the term “peer tutoring” to refer to any instance of one student attempting to help a peer understand a curricular idea. My usage of the term is agnostic about the formality of the tutoring arrangement or the relationship between the students. Sometimes, peer tutoring is formal; for instance, an afterschool program can formalize a process whereby one student is assigned to support a classmate with math. But more often it is informal; for instance, whenever students work together in a classroom, there is a high likelihood one will struggle with a concept the other grasps, leading to an impromptu teaching moment.

While I consider both formal and informal teaching between peers to be peer tutoring, much of the literature reserves that term solely for formal arrangements. To illustrate, Topping (2005) writes, “Peer tutoring (PT) is characterized by specific role-taking as tutor or tutee, with high focus on curriculum content and usually also on clear procedures for interaction, in which participants receive generic and/or specific training” (p. 632). While my approach to peer tutoring does involve training students to think about tutoring through a new frame and to use specific teaching moves, it does not prescribe procedures and there need not be explicit acknowledgment that one student is a “tutor” while the other is a “tutee.”

Peer tutoring occurs between two students near the same age. Similar to how Topping (2005) describes “peer helpers,” in peer tutoring, both students should be “status equals” with relatively similar abilities such that “both members of the pair find some cognitive challenge in their joint activities” (p. 631-632). So why is it that I have opted for “peer tutor” instead of “peer helper”? “Peer tutor” is a more precise descriptor of the type of peer-to-peer teaching I am describing. “Peer helper” is too vague. Helping can occur when one student helps a peer cut out flash cards. The word “tutor” (like “teacher”) implies that one student is supporting the thinking, understanding, or learning of a peer, which is the focus of this study.

Is peer tutoring a way to replace teachers? No. Good teachers have content knowledge, pedagogical knowledge, and pedagogical content knowledge (i.e., knowledge on how to teach specific material) that far exceeds what we should expect student tutors to possess (Shulman, 1986). Students can, however, provide consistent and timely one-on-one support to each other when teachers cannot, and peer tutoring has been shown to boost learning for tutors and tutees, as discussed above. Peer tutors thus offer great opportunity for supplementing and supporting teachers. This possibility can only be realized, however, if the tutoring interactions are productive for learning. Prior research on peer tutors has found that tutors tend to position themselves primarily as explainers (King, 1997; Berghmans et al., 2013), which contradicts effective teaching pedagogy. But what if students were taught how to be effective peer tutors?

The present study evaluates a program that aims to do just that: train peer tutors to reduce reliance on explanation and instead incorporate moves that elicit the thinking of tutees.

Specifically, PeerTeach trains students to use three research-based *talk moves* aimed at better understanding a learner: eliciting, revoicing, and probing. To train tutors, PeerTeach harnesses videos—some real-life, but most animated—embedded within an interactive application. The structure of the training module borrows from several areas of teacher professional development: talk moves, video-based reflection, and teacher noticing. The training is preceded by a pre-survey and followed by an identical post survey with the questions, “What do good tutors do?” and “What do bad tutors do?” They are intended to give a snapshot of students’ beliefs about tutoring before and after the training, which has the following structure:

Phase 1: Students watch animated videos that contain instances of both effective and ineffective tutoring behaviors. Effective moves include eliciting, probing, and revoicing; ineffective moves include over-explaining, unclear explaining, and yes/no checks for understanding that fail to elicit tutee thinking. As students watch animated tutoring interactions, they tag the video in places where they see “good” and “bad” tutoring moves then explain their thinking. This process leaves a time-stamped record of what they notice as good and bad, providing baseline data on how they think about tutoring.

Phase 2: Students are taught eliciting, probing, and revoicing talk moves through explanatory videos that offer examples of each type of move and explanations of how they are useful.

Phase 3: To ensure that students have successfully learned what the talk moves are, and to provide them practice engaging with them, students then watch animated teaching interactions and tag the videos for instances of each type of talk move. Data collected provide evidence of students’ understanding of the talk moves.

Phase 4: Lastly, tutors are given opportunities to practice tutoring a teachable agent, a virtual learner. In this low-stakes environment, children can practice using talk moves as they engage with the struggling computer-simulated tutee. Tutors are given three speech options to choose between then see realistic responses from the virtual learner. [This part of the training was not completed in time for this pilot study.]

Phase 5: The PeerTeach training concludes with an opportunity to rewatch the videos from Phase 1 and to again tag them for good and bad teaching moves. This is an opportunity to measure changes in what students perceive as good and bad tutoring.

I developed the PeerTeach training system with content development support from a Stanford colleague. We are both former teachers and current doctoral students. Simultaneously, I designed the PeerTeach website, which was coded in phases by a professional web developer. Before piloting the PeerTeach program through this research, the website was designed for maximum usability through several rounds of testing and iteration with both adults and children. This effort was intended to ensure that the findings of this pilot study result from the intervention approach, not poor user-experience design. The website acts as both an instructional and assessment tool. In addition to explaining and modeling research-based talk moves, it captures data on students’ emerging capacities to identify and use them, with the ultimate goal of improving students’ abilities to elicit and probe the thinking of their peers.

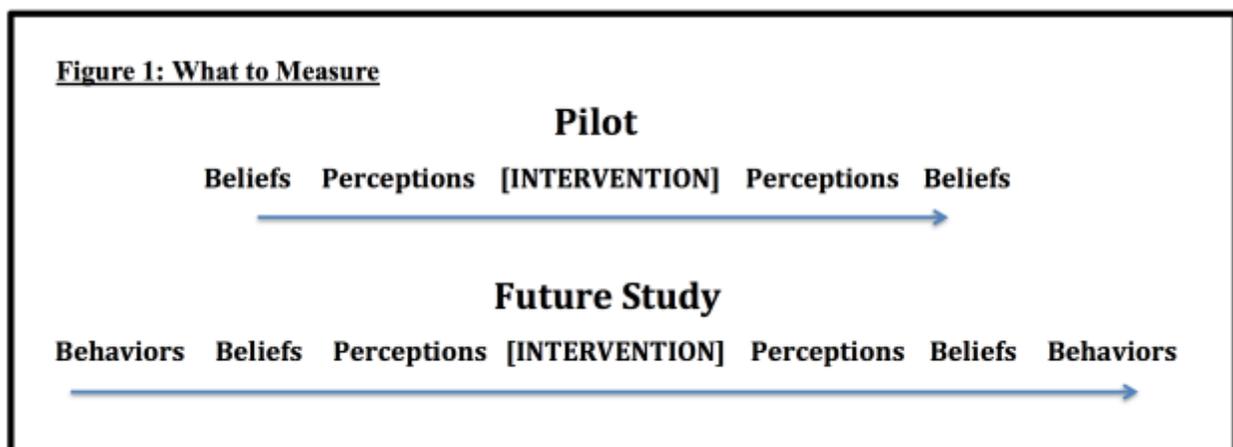
Aims of Current Study

This pilot study aimed to determine whether the PeerTeach training effectively changes 1) what students believe to be good and bad tutoring and 2) what practices they identify as good or bad when they observe tutoring. If the end goal is for tutors to change their behaviors, then changing their beliefs about tutoring practices and their perceptions of observed practices is a useful first step. This is not because beliefs must shift before behaviors; decades of social psychological research have shown that beliefs and behaviors interact in complex ways that are not unidirectionally causal or sequential. For instance, Higgins and Rholes (1978) showed that behavior change can shift beliefs with their “Saying is Believing” intervention while Dweck (2006) showed that beliefs can shift behaviors with her growth mindset intervention. While I do plan to measure behaviors in a future study through systematic video analysis, I chose to measure shifting beliefs and perceptions in this pilot study. This study answered the following research questions:

As students participate in the PeerTeach intervention:

- **How do their beliefs about good and bad tutoring shift?**
- **How do their perceptions of observed tutoring practices shift?**
- **How do their stated beliefs about good and bad tutoring relate to what they perceive as good and bad during actual tutoring sessions?**

The findings from this pilot study will inform future development of the PeerTeach training and the larger study that will take place during the 2017-2018 school year. While this study focuses on beliefs and perceptions, that larger study will examine how PeerTeach changes tutoring behaviors and tutee learning as well. Figure 1 shows the relationship between what is being measured in the pilot and future study.



The Case for Talk Moves

Talk moves, or *talk tools*, are the result of nearly three decades of qualitative research aimed at identifying the speaking choices of teachers who are skillful at orchestrating equitable and productive classroom discourse (Godfrey & O'Connor, 1995; O'Connor, 1996; O'Connor, 2001; O'Connor & Michaels, 1993, 1996, & 2009). Sarah Michaels and Catherine O'Connor (2009) describe the power of talk moves:

An utterance-level tool, a talk move, can be easy to remember and easy to pull out with a bit of practice. A whole set of tools can fit on a clipboard for reference during discussions. Moreover, these moves change the nature of the talk that transpires between teacher and students and among students. These talk moves work by positioning students differently than is typical in most lessons. They are thus powerful context- and people-transforming moves (p. 336).

From the teacher talk moves described in this literature, I identified a subset of moves that are ideal for peer tutoring as they are conceptually simple and intended for one-on-one interactions. The talk moves I trained children to use are 1) eliciting questions that encourage students to express their mathematical ideas (e.g., “Say more”), 2) probing questions that dig into why students think what they think (e.g., “Why do you think that?”), and 3) revoicing moves where tutors state what they think the learner is saying. There are two main ways that these talk moves promote learning. First, eliciting and probing moves encourage tutees to talk, which forces them to make sense of their thoughts in order to verbalize them. It is common for this alone to help learners work through ideas and develop solutions on their own (Webb and Mastergeorge, 2003). At minimum, eliciting and probing moves push students to take stock of what they do or don't know at any given moment and makes them active participants in knowledge creation. Second, all three talk moves enable the tutor to better understand how others think. With that, tutors are more likely to identify misconceptions, gaps in knowledge, and errors in reasoning, preparing them to intervene more effectively.

Training adults to use structured talk moves produces deeper student engagement with math content and has been shown to increase mathematical understanding (Resnick et al., 2010). Further, as the quote above states, talk moves “can be easy to remember and easy to pull out with a bit of practice,” making them practical and realistic teaching techniques for children. Therefore, I hypothesize that preparing children to use eliciting, probing, and revoicing talk moves could be an effective way to shift students from what is typical – didactic, tutor-centered teaching – to more facilitative strategies that promote better dialogue and learning.

The Case for Animation

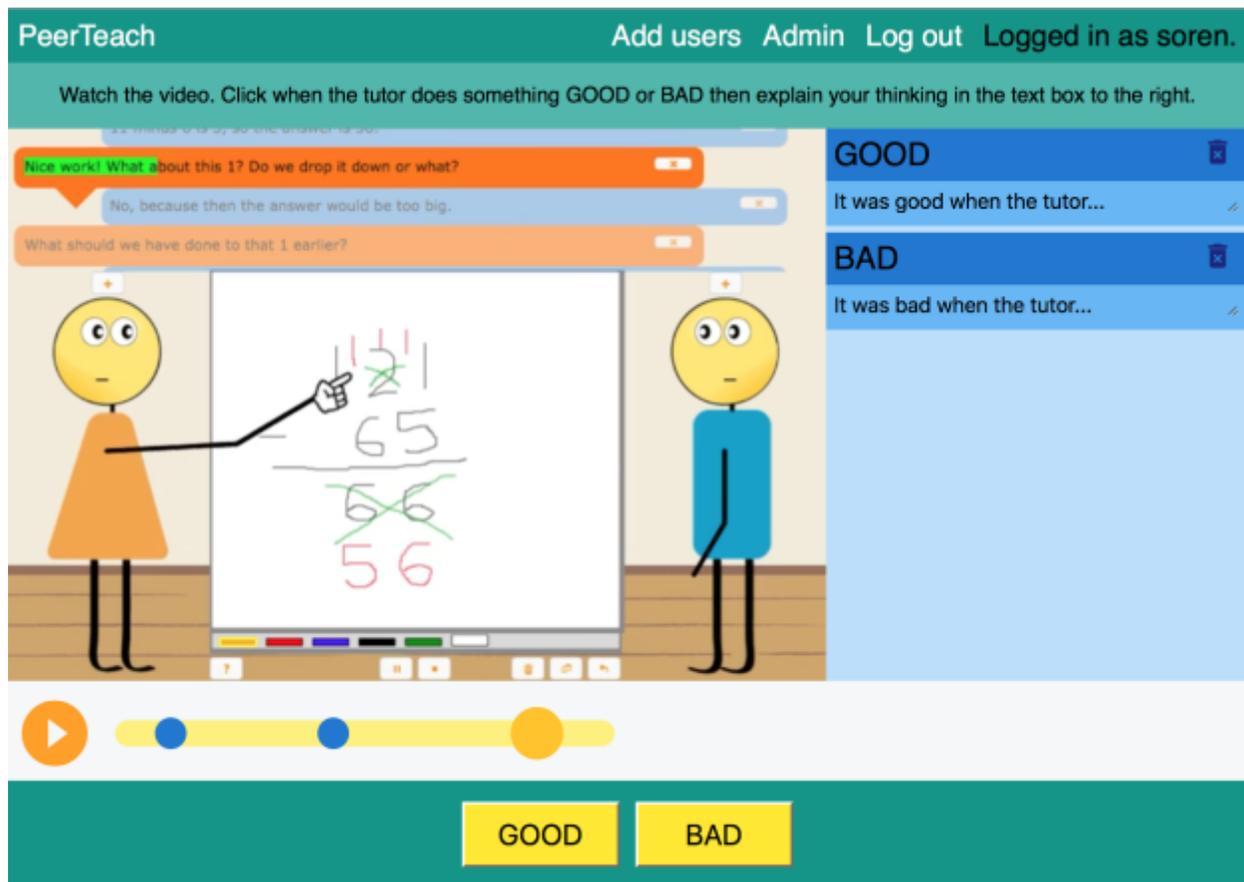
For decades teachers have been using video to study their craft. Videos of teaching have clear benefits, allowing viewers to analyze the richness and complexity of real learning environments (Zhang et al., 2009). But that richness and complexity presents considerable

challenges as well. Without sufficient guidance, teachers tend to focus too much on superficial characteristics of teaching that distract them from performing more meaningful analysis (Calandra et al., 2008 and Santagata, 2009). Similarly, in their work on teacher *noticing*, Jacobs et al. (2010) found that while experienced teachers were capable of noticing students' strategies and understandings through videos, more novice teachers struggled to notice those same things – although, importantly, they were capable of being trained to notice at a higher level.

Using animated videos for professional development avoids several of the challenges of using traditional videos that feature actual teachers and students. Chazan and Herbst (2012) found that animated teaching interactions offer two key affordances: 1) teachers found it easier to be critical of animated figures because, they theorize, teachers find it impolite to criticize other teachers; and 2) perhaps non-intuitively, teachers found it easier to relate to non-distinct animated figures. Unlike recordings that show children who fail to resemble their own students, teacher-viewers can see their own students in cartoon learners. Thus, instead of having the reaction, “These kids are not like mine,” Chazan and Herbst found that teachers are more willing to engage with teaching scenarios featuring cartoon students who could represent any children.

While recorded videos from classrooms offer considerable leverage for exploring the richness and complexity of classrooms, they are difficult for even adults to navigate and analyze. Because this proposed research project aims to deliver an adjusted version of teacher professional development to children, minimizing the complexity and the distractions of the video-based interactions is paramount. As such, the PeerTeach training utilizes animation to afford a simple, guided viewing experience (shown in Figure 2). Animated tutoring scenarios in PeerTeach allow children to attend to the speaking decisions of tutors without being distracted by superficial features of the interactions. And, as Chazan and Herbst might predict, they pre-empt the concern that the figures on the screen are not *like us*.

Figure 2: PeerTeach Animation



Settings for the Pilot Study

The pilot study took place in two schools on opposite sides of the country. The first group of students were 17 eighth graders at a high performing charter school in Harlem, New York. These students chose to participate in the study by coming to school on a Saturday. Nearly all of the students in this school are black and Latinx; 95% of them receive free or reduced-price lunch. One unique feature of this student population is that all of them have been participating in peer-to-peer tutoring in their math class throughout the past school year. Additionally, their math teacher encourages tutors to ask questions, not give answers, and try to understand the thinking of others they are helping. Thus, not only did they have experience peer-tutoring, they had received messaging about tutoring that was well-aligned to the pedagogical stance of PeerTeach.

The second and third groups of students who participated in this pilot study attend a public middle school in a suburban part of the East Bay Area. This school is about half Asian, one fifth white, and a quarter Latinx, black, Filipino, and multi-racial. This school is also high performing, with proficiency rates far above the state average. The first group of students at this

school to participate in the pilot study were 28 “drop-in” students; during their two 30-minute elective periods for one week, they opted to participate in the tutorial titled, “Peer Tutor Like a Boss.” The second group of participating students at this school were in a video production class. For them, the goal was not just to complete the PeerTeach training; their interactions with the website were followed by a two-week project where they created videos modeling good and bad tutoring moves. Importantly, this last group of students did not choose to participate in the same way that the other groups did. They did not volunteer themselves. While the other two groups actively opted in, these students would have had to opt out in order to not participate.

Results of the Pilot Study

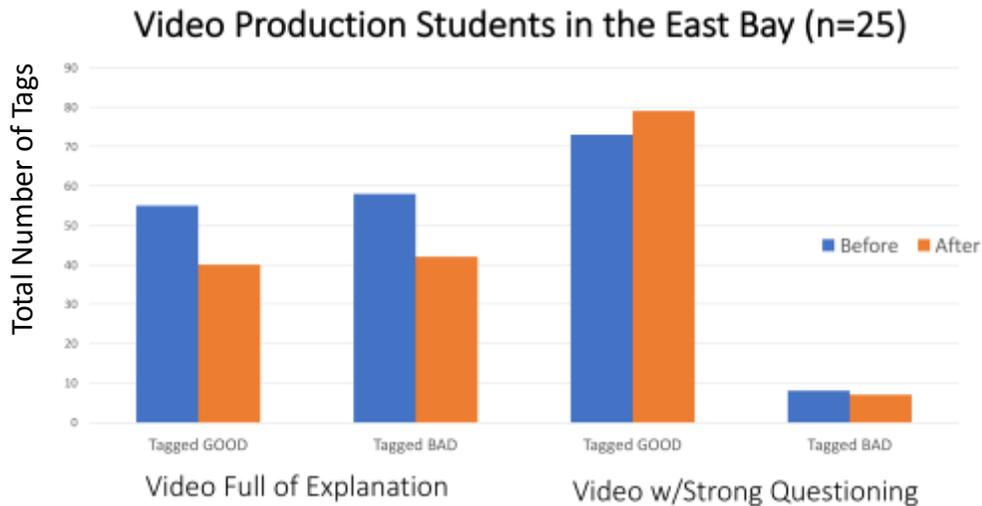
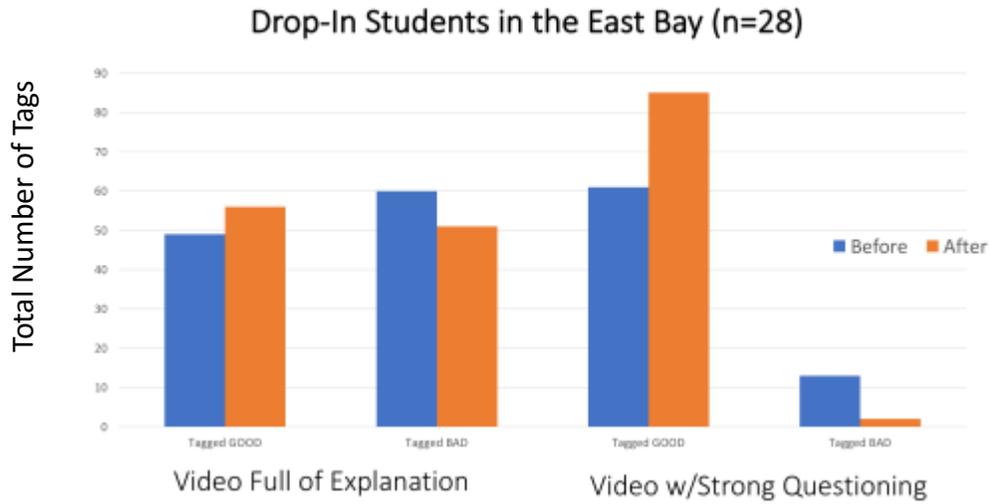
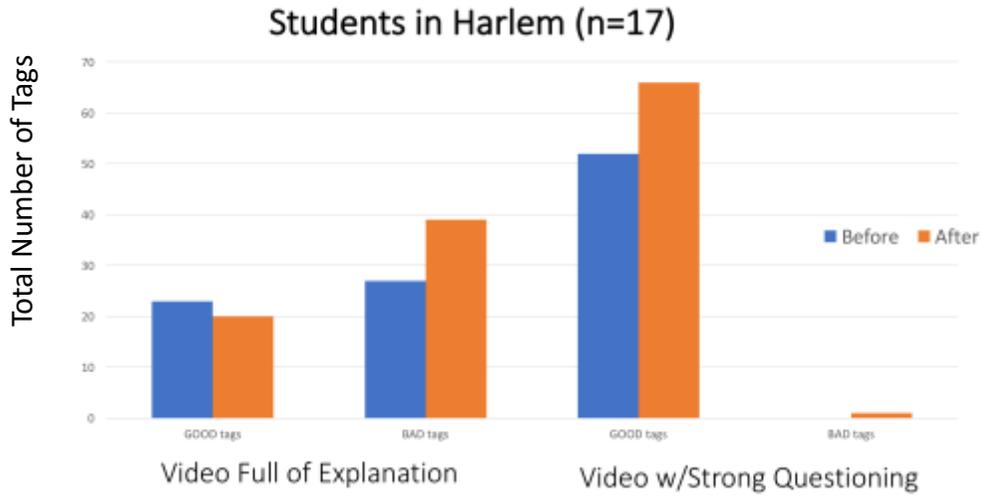
As described in the section, “My Approach to Training Peer Tutors,” the pilot study was structured in the following way:

1. Students take a pre-survey on their beliefs about tutoring
2. Students observe cartoon tutoring interactions noting what they perceive as good and bad tutoring behaviors
3. Students engage with the PeerTeach training, first learning about research-based talk moves then practicing identifying them
4. Students repeat the perceptions exercise with the same original videos
5. Students respond to an identical post-survey on their beliefs about tutoring

Analysis on student responses to the pre- and post-surveys is not yet complete. Thus far, analysis has focused on what students identified as good and bad tutoring practices when observing cartoon tutoring sessions, before and after the intervention (steps 2 and 4 above).

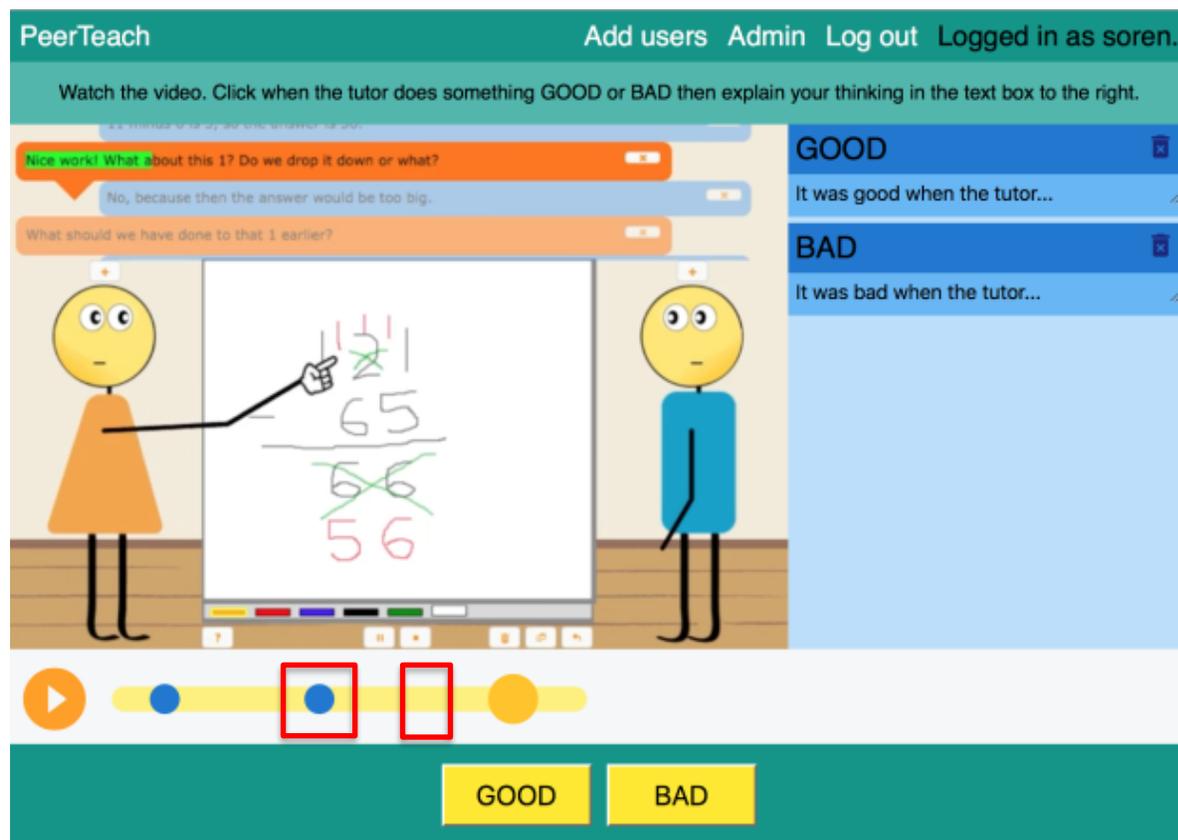
There were two videos in the pre- and post-assessment measuring student perceptions of observed tutoring. The first was a realistic representation of typical peer tutoring that relies too heavily on explanation as an instructional tool. This video had five instances of tutors using over-explanation, unclear explanation, and explanation before diagnosing tutee understanding. It also had two instances of Yes/No checks for understanding where the tutor missed an opportunity to gain deeper insight into the thinking of the tutee. The second assessment video represented an elicitive tutor who focused on asking good questions over explaining. This video had nine instances of high quality talk moves: four eliciting, two revoicing, and three probing moves. The first goal of the PeerTeach intervention was to increase how often students noticed good moves in the elicitive video and bad moves in the over-explanation video between the pre- and post-assessment. The results in Tables 1-3 suggest that the students in Harlem improved in their abilities to recognize both good and bad tutoring while the Drop-In students in the East bay only improved in their abilities to recognize good tutoring. The video production students – who did not elect to participate in the same manner as the others – showed no positive growth.

Tables 1-3: Student Tagging Between Assessment Videos



The next line of analysis took a more precise look at how students tagged videos in the pre- and post-assessment. Whereas the prior analysis tallied the total number of good and bad tags in each video for each group of students, this strain of analysis asked how often students tagged high quality moves as good and how often they tagged low quality moves as bad. In other words, simply tagging “good” in the video characterized by facilitative tutoring would not necessarily count toward this measurement. Students had to notice when a facilitative move was happening and tag it as “good” in that moment (plus or minus a few seconds) to receive credit. To perform this analysis, I created an answer key that represented the timing in each video when each tutoring move, good or bad, occurred. To visualize this, note the red boxes in figure 3. They represent moments when the tutor used low quality moves. In this example, the student user accurately identified the first of the two low quality moves as bad (the blue circles symbolize where the user tagged).

Figure 3: PeerTeach Animation Showing Answer Key of Low Quality Moves

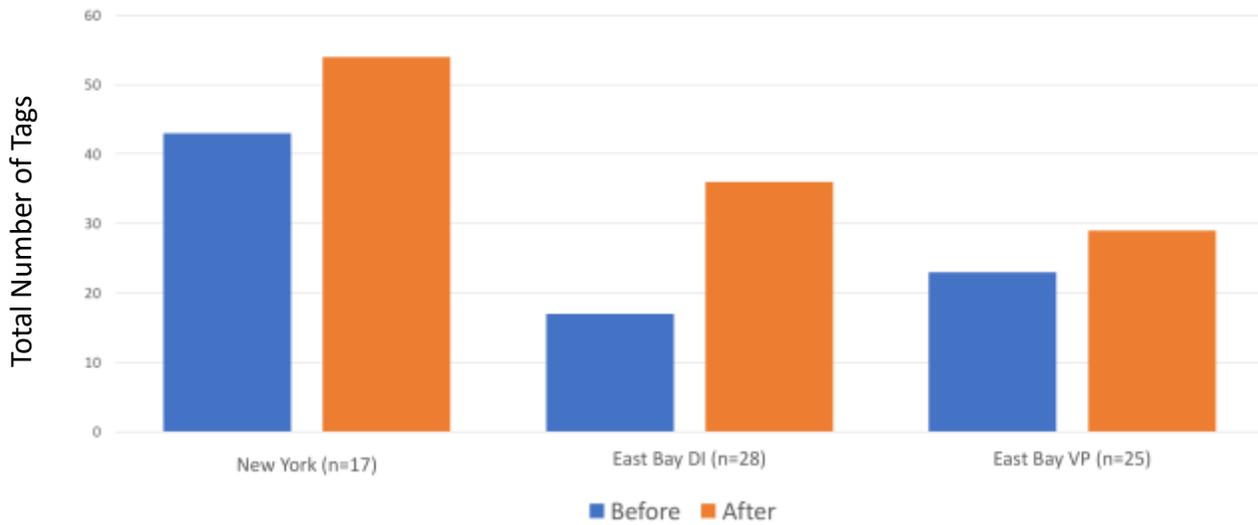


The results in Tables 4-5 suggest that students across groups improved in their abilities to accurately identify high quality moves as good, but did not improve in their abilities to identify low quality moves as bad. Still, it should be noted that students in the East Bay school identified dramatically fewer high quality moves as good than did the students in Harlem. When taking into

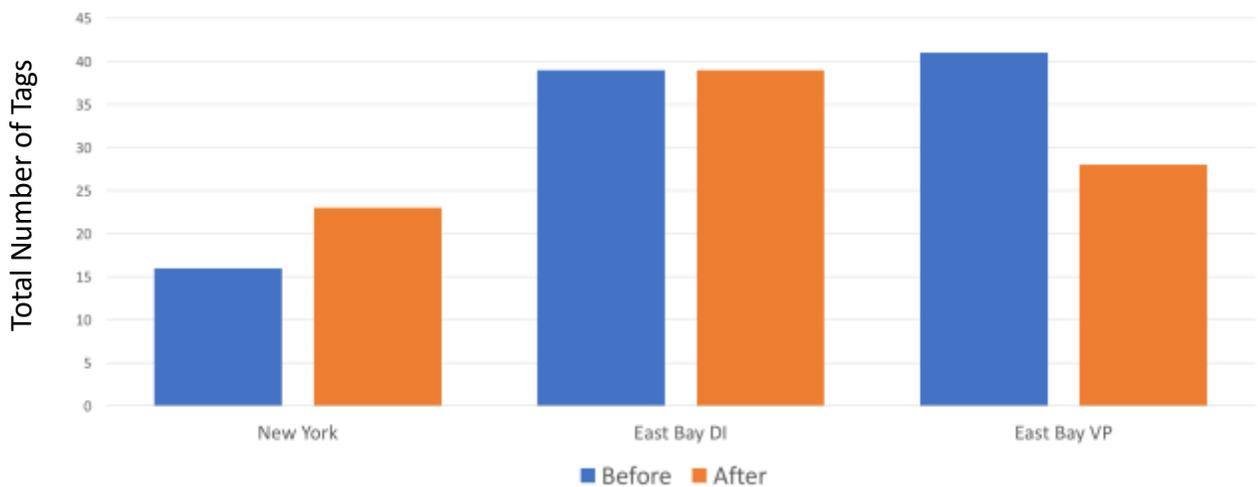
account that there were significantly fewer Harlem students than students in either East Bay group, this finding is even more striking. On average, Harlem students identified 3.18 high quality moves as good in the post-assessment while the East Bay students identified, on average, only 1.23.

Tables 4-5: Student Tagging of Specific Moves

Tagging GOOD Moves as "GOOD"

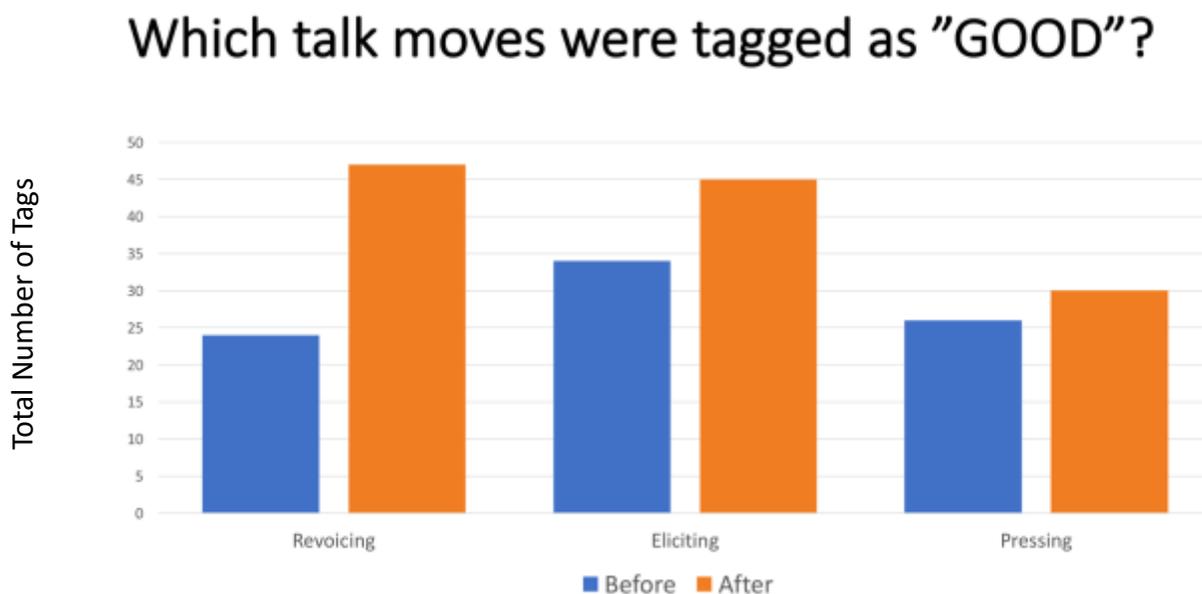


Tagging BAD Moves as "BAD"



The last question I set out to answer was, How did students grow in relation to each of the three talk moves: eliciting, revoicing, and probing? As table 6 shows, I found that students improved by far the most in their abilities to recognize revoicing moves as good. This was likely due, in large part, to the consistent cues of revoicing moves (i.e., something like, “I hear you saying”). Eliciting and probing moves are more context specific in the ways they are worded and are thus likely harder to identify. Between the pre- and post-assessment, eliciting moves also increased in how often they were identified as good. Probing moves, the most difficult of the three moves to employ, grew the least in how often they were identified as good.

Table 6: Student Tagging of Each Talk Move



Discussion and Next Steps

PeerTeach is designed to promote good moves, not deter bad ones. Students in each group appear to have improved in their abilities to notice high quality talk moves and recognize them as good. While the video production group only experienced a marginal increase, the other two groups experienced what appears to be significant growth. However, students did not appear to improve in their abilities to recognize low quality moves: over-explanation, unclear explanation, and explanation before diagnosing the learner. This finding is not surprising, given that the structure of the training emphasizes high quality talk moves. While there is explicit mention of those low quality explanation moves, they are not emphasized and there are no opportunities to practice identifying them. In the next phase of content development, I will prepare levels that offer practice in identifying low quality teaching moves and see if that creates an improved result.

Tutoring experience and choosing to take the training correlate with better results. The students in Harlem have been tutoring for the past year and have received messaging from their math teacher that good tutoring is about understanding what the other student is thinking. As such, it is no surprise that these students were much stronger at identifying high quality talk moves as good in both the pre- and post-assessment. What is more interesting is that there appear to be significant differences between the two groups of students in the East Bay school. Despite being relatively similar groups of students, the drop-in students experienced much more growth in their abilities to recognize high quality tutoring moves as good. This was perhaps because these students were more motivated to learn to tutor, given that they chose to take an elective class on becoming a better tutor. An alternative explanation is that they are, in fact, a significantly different student population, perhaps one made up of students who have more tutoring experience or a different mindset about tutoring. Analysis of their belief surveys should inform that open question. In the future, it will be important to examine the contexts in which students do the PeerTeach training. I would predict that students who choose to participate in the training, and especially those who have plans to tutor in the future, will experience more growth.

The current assessment failed to distinguish between strong and weak understandings of the talk moves. Other strains of analysis not included in this report suggest that students may be interpreting any instance of revoicing as good, even instances of inappropriate revoicing. An example of this is when a tutee gives a short, clear response then the tutor chooses to revoice using the same words, such as:

Tutee: “No, I didn’t do the homework.”

Tutor: “I hear you saying that you didn’t do the homework.”

This usage is inappropriate. It does not clarify a misunderstanding, create more alignment between students, acknowledge an important idea, or push the tutee to reconsider an idea, which are all useful intentions for revoicing (Herbel-Eisenmann et al., 2009). In the next iteration of the study, the assessment will include both appropriate and inappropriate uses of the talk moves to distinguish between students simply looking for talk moves to tag and students who actually recognize when and how talk moves should be employed.

Students enjoy PeerTeach, find it useful, and this early version of the training does impact how students think about tutoring. This report limited its scope to analyzing how students clicked on the PeerTeach website and what that reveals about their thinking before and after the intervention. While I am yet to perform rigorous analysis on students’ feedback on the tool, reading their comments did reveal that participants enjoyed PeerTeach and found it useful. Additionally, analyzing their interactions with the site suggests that it also changed how they view tutoring. Overall, students improved in their abilities to notice and recognize high quality talk moves as good. New developments on the website, in part driven by pilot findings, should make the training even more impactful. At the top of that list is the next set of practice levels where students will be able to choose tutoring moves and see how they impact a virtual learner.

A Concluding Thought

In the words of Paulo Freire (1970), “To teach is not *to transfer knowledge* but to create the possibilities for the production or construction of knowledge” (p. 30). While many teachers have by now embraced this pedagogical stance, not many 11-year olds read Freire. And that is partly why, as Roscoe and Chi (2007) write,

Peer tutors tend to exhibit a pervasive knowledge-telling bias. Peer tutors, even when trained, focus more on delivering knowledge rather than developing it. As a result, the true potential for tutor learning may rarely be achieved.

Despite the limited teaching skills of students, peer tutoring results in learning gains. Such a finding is testament to the potential of one-on-one teaching. PeerTeach was developed to unleash students’ full potential, to improve tutor practices and discover just how transformative peer-to-peer teaching can be when tutors become co-constructors rather than purveyors of knowledge. To unlock their “true potential” as learning guides, PeerTeach trains students to develop more useful conceptions of how learning works and to use talk tools to execute those learning theories.

This pilot study accomplished two important goals: 1) it generated a bevy of solutions to improve both the training and research instruments and 2) the interaction data suggest PeerTeach did actually change how students think about teaching practices. In the long journey of PeerTeach, this pilot study constitutes but a mere early chapter. Hopefully the final chapter of this book will tell the story of classrooms where every student is empowered and equipped to be a (good) teacher.

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