

# Talking for Understanding in a High School Geometry Classroom

Praxis Project Thesis: Submitted in partial fulfillment of the requirements for the degree of Bachelor of Arts — as part of the Community, Youth, and Education Studies Major at Clark University

**Grace D. Smith**



## Table of Contents:

<b>1. Abstract</b>	<b>3</b>
<b>2. Acknowledgements</b>	<b>3</b>
<b>3. Introduction, Research Questions and Goals</b>	<b>4</b>
<b>4. Ethnographic Context</b>	<b>8</b>
a. Claremont Academy	
b. Sarah Cramer and her 6th Period Class	
c. Challenges of Period 6	
d. Student Context: post-pandemic	
<b>5. My Identity and Positionality</b>	<b>9</b>
a. Role and identity in Sarah’s Classroom	
b. Positionality--Insider/Outsider Status	
c. Influences – as a CYES major and prospective teacher	
d. Importance of Education for Youth	
e. Concluding Thoughts	
<b>6. Literature Review</b>	<b>13</b>
a. Situating Talking For Understanding in a Broader Literature	
i. Teachers Learning to Implement Equitable Classroom Talk	
ii. A Dialogic Teaching Companion	
iii. Talk Science Primer	
b. Conclusion	
<b>7. Conceptual Framework</b>	<b>20</b>
<b>8. Methodology and Methods</b>	<b>22</b>
a. Ethnographic Approach	
b. Data Collection Methods	
i. Class Session Recordings	
ii. Observations to Analytic Memos and Analysis	
iii. Interviews with Sarah and her Daily Reflections	
iv. Student Survey	
v. Student Interviews	
<b>9. Findings</b>	<b>26</b>
a. Classroom Norms	
b. Classroom Collaboration	
c. Collective Understanding	
<b>10. Conclusion/Significance</b>	<b>44</b>
<b>11. Works Cited</b>	<b>47</b>

## **Praxis Thesis Final**

### **Abstract**

The reason I decided to work with Sarah Cramer at Claremont to continue her research was because of how important I think it is for all students to understand topics within the classroom. I decided to challenge myself by working within a high school class when my future career is in elementary education. I knew that learning and researching Talking for Understanding (T4U) would be important for all grades and that by taking on this challenge I could learn first-hand how T4U is beneficial for students. Talking for Understanding is something that I think can make an impact on many students and teachers from around the world. My goal behind this research was to see how and what Sarah Cramer does to create and maintain an environment that can exhibit Talking for Understanding. The ways that I collected my data was through observation notes or analytic memos, reflections from Sarah Cramer, one student survey, and three student interviews. I collected this data for a year (fall 2021-spring 2022), but I have been working on this research study since the spring of 2020. I learned that it takes a long time to develop or make a classroom work together and a lot of failures before you may make a breakthrough with students. I focused on three main themes that I found to be the foundation of building T4U: Classroom norms, classroom collaboration, and collective understanding. Each of these themes will be described in more depth throughout my paper. From the data I collected I went through a lot of struggles within the classroom with the students listening and working together, and it took a lot of effort from Sarah Cramer to push the students to learn how to respect and work as a unit. This research was really significant for me as a future educator because I was able to see realistic work within the classroom and realized it takes dedication, time and effort for students and the teacher to develop really impactful conversations that can lead to student understanding.

### **Acknowledgements:**

I would like to thank my thesis committee, Eric DeMeulenaere, my advisor Sarah Michaels, and my mentor teacher and co-researcher Sarah Cramer. Sarah Cramer has spent a great deal of time talking and working with me over the years and I am entirely grateful that she also took the time to read and comment on my thesis with her schedule as a teacher. I also appreciate the support and help that I received from my best friend and roommate Emily Dorsey,

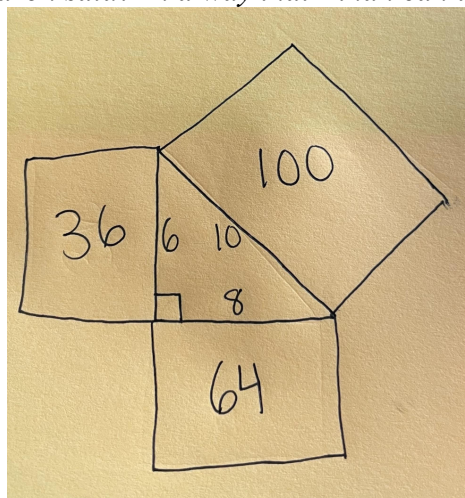
who has been reading and editing my thesis with me from the start. Finally, I would like to thank Sarah Cramers' students that I worked with at Claremont Academy, because without them I would not be able to have this project. I will never forget all that I have learned from Sarah Cramer and her students while working on this project.

### **Introduction and Research Question:**

#### ***Vignette: Claremont Academy 10th Grade Geometry Classroom- November 14th, 2020***

*It was a weekday morning for tenth graders in Sarah Cramer's geometry class and they were starting a new topic on the Pythagorean Theorem. Students were split up into different groups and had to calculate the area of the squares formed by the sides of a right triangle. To find the area of the squares, the students had to use a combination of multiplication and addition depending on the given information of the shape to determine the size of the overall figure. Some students expressed confusion: "I don't get it Miss... Can you show us again?" Many students had come to find an answer but there was one student (Ethan)<sup>1</sup> who was struggling with understanding how to find a certain answer. When Ethan explained his confusion, Sarah Cramer said,*

*"It's okay to be confused, but it's not okay to not do anything when you're confused. That's what we've all been working on together. Asking when we don't understand. Having someone repeat it. Putting it in your own words. Does anyone think they can put it in their own words what Aaron said? In a way that Ethan can understand?"*



***Figure 1: This is an example of the squares students used to solve for the area.***

---

<sup>1</sup> All student names within this thesis have been changed to pseudonyms so there is no evidence of personal information.

*Sarah had several students demonstrate what they had found so far in ways that Ethan could understand. One student explained how they solved the problem by adding the areas of  $6*6=36$  and  $8*8=64$  together to find the combination of the two squares added to 100 (look above at Figure 1). Even after three students explained how they solved their problems, Ethan was really struggling to understand this assignment, “I am not getting where you are going with this.”*

*However, there were several students that wanted to help him understand. One student even commented, “I just wanna help him--I wanna help him so bad.” The students continued to break down the problem in different ways and worked together a way for Ethan to understand how you found the area of the shape. After twelve minutes of working together and restating how students found the problem, Ethan (and the rest of the class) were able to restate and understand how to solve the problem and the answer.*

*Eventually Sarah Cramer had Ethan explain the answer: “Put it in a sentence? Aight these two here equals 100,” and the whole class applauded him for finally finding and understanding the answer to the problem. Each of these students, although they understood the answer already helped Ethan to understand the problem, and Sarah Cramer found it important to take all the time he needed to understand.*

### **Commentary:**

This vignette exemplifies something special that Sarah Cramer and I would call, “Talking for Understanding,” (T4U). The way I define T4U is: a form of dialogic teaching and learning -- in which the teacher supports students to learn and collaborate with peers, in order to build a deep collective understanding. The main purpose of T4U is to have students comfortable within the classroom setting to talk about what they don't know, what they do understand and to learn from one another as well as individuals, by going public with their thinking and questions. When T4U is happening, students are able to work together to understand a problem and the teacher facilitates the conversation to ensure that students listen to each other and work together as a group. T4U is an attempt to make a more comfortable classroom environment where all people feel comfortable to voice opinions and ask for help, without being afraid to speak up. This vignette illustrates a moment where a class worked for 12 minutes just so the group could -- together -- better understand the concept of the Pythagorean theorem and more importantly, take the time just so that one student could understand this concept before moving on. This

exemplifies not only that individual students were able to understand something but that other students were eager to help one another learn as well.

One important thing to note is that this classroom conversation happened in 2020, before the COVID-19 pandemic. This exchange was something I witnessed as an observer in Sarah's class as part of a course I was taking at the time. During my observation that day, I could see how the T4U approach supported a collective process of learning where the whole class was able to understand a problem. It's also important to acknowledge that Sarah Cramer coined the term "Talking for Understanding." She has been using T4U in her classes and has been researching it for years.

At the end of this particular conversation, Sarah explained to her students, "The reason why we spent 12 minutes on that is because I sincerely believe that everyone needs to understand this and I –and I really bet that it wasn't just Ethan who didn't get it until right then. I bet there were a few people who were still struggling." Sarah Cramer tries to set up her class as a team because she finds it extremely important that they learn from peers, not just her, and that her students feel comfortable to explain their thinking, and speak up when they don't understand something.

Sarah Cramer is a Clark alumna (she majored in Math and Spanish), and a graduate of Clark's MAT (Teacher Education) program. She has been teaching high school math for six years. As I said, she coined the term T4U and has been researching and documenting how she uses T4U within the classroom to help her students for the past three years.

I first encountered Sarah's research as part of a class I took at Clark University for the Community, Youth, and Education Studies (CYES) major. I was inspired by what I saw in her classroom, and how she talked about Talking for Understanding. I thought it could be potentially beneficial for other teachers of any grade or subject area.

Throughout my years of volunteering in schools, I have noticed too often that students' opinions or comments are ignored by teachers (and their peers) in the effort to "cover" all of the curriculum necessary for the year. With T4U, I was able to see the teacher use student thinking or opinions to help teach and I saw students excited about what they were learning for what seemed like the first time. I knew that I wanted to learn from Sarah Cramer all that I could about T4U, which has led to my praxis project. I have been studying her research from before, during

and post-pandemic (or at least post-remote learning) and I have learned many things about what is necessary for T4U to happen from these experiences.

Throughout the fall semester in 2021, I worked closely with Sarah – to carry out my praxis project. She and I worked on developing elements of T4U within the classroom with a challenging group of students – who had been struggling in person after a year and a half of remote learning during the pandemic. The transition back was a challenging one. We were determined to support T4U, but we had to teach students how to help one another and how to collaborate in groups again. Our goal was to make it possible for T4U to happen so that these students would learn more by talking with their peers and collaborating to learn math. This leads to what I have been focusing on for my research.

In my praxis project, I focused on these research questions:

1. What can I learn from Sarah Cramer with respect to classroom talk and “Talking for Understanding” in order to better understand what “T4U” is and what is happening with her students?
  - a. How does Sarah Cramer build her classroom culture and norms for talk in the first two weeks of school and throughout the school year?
  - b. What struggles did she face (returning from remote teaching) with Talking for Understanding, and how did she handle them?
    - i. What talk strategies or activities did she use to promote T4U?
    - ii. How did Sarah adapt her plans to respond to students’ needs?
2. What do students do and say in math class? And what can I learn from Sarah’s students about what T4U is and how they understand talk and participation in Sarah’s class?

Based on my observations, T4U creates a collaborative learning process between both students and teachers. I hope that answering these questions will help me understand better what T4U is, in order to use T4U with my students in my future elementary classroom, and so that other teachers can use this to help their own students learn as well.

## **Ethnographic Context:**

### **Claremont Academy:**

My praxis project site is a tenth-grade math class at Claremont Academy, a public school for grades 7-12 in Worcester, MA. Claremont Academy has a diverse student body where most students have known each other since middle or even elementary school grades. Claremont has a 94% minority enrollment of students within the school (US News, 2019). There are approximately 527 students and around 15 students to every one teacher (MA School and District Profiles, 2022). The vast majority of students speak a language other than English at home, and there's a high proportion of Emergent Multilingual Learners (formerly referred to as ESL students). The majority of these students speak Spanish. From what I have seen within the Claremont community, students are able to make great relationships with their peers because they have been going to school together since elementary school at Woodland Academy, also located in the same building. Also, the class sizes are relatively small (approximately 20-25 students per class). The school motto is, "Ubuntu" – which means, "I am because we are."

### **Sarah Cramer and her 6th Period Class:**

Sarah Cramer is passionate about her students, and works intentionally to build a classroom environment where all students feel comfortable and respected. As mentioned above, Sarah is a teacher researcher who has been researching T4U within her classrooms within the last couple of years. She's the epitome of a reflective practitioner. Sarah also cares deeply about students bringing their home cultures and languages into the classroom. She encourages students to speak their native languages with others and she also provides directions and activities in English and Spanish. In Sarah Cramer's class there are 23 students and several of them are bilingual with Spanish being their first language. There have been several students that learn through translation to peers in their native languages (which I will speak on later).

### **Challenges of Period 6:**

This class was difficult to have large discussions with because of the lunch scheduling and boisterous personalities. The class began at 11:55 and was interrupted each day by their lunch period between 12:15-12:43, where they returned to class from 12:45-1:16. Although there had been some moments where students were working together this interruption made it difficult



to maintain student focus in class. Since there was only a small amount of time before lunch begins it only gave enough time to have their daily mindfulness exercise and work on their starter (or assignment that begins the class) and then directions for what would happen after the lunch period. Then when the students came back from lunch it took a long time for them to regain focus and finish their assignments. There were a lot of students that were really talkative and seemed to know each other really well, there were also students who were more quiet but talked more when in smaller groups. Due to this constant dilemma, two of the extremely talkative students within this class were moved out of this class to attempt to create a better classroom balance. Overall, I was excited to see the growth of the students while working with Sarah's class throughout the whole year.

### **Student Context: post-pandemic**

It's important to provide some background about the students, in light of the fact that they were all returning to in-person school at Claremont after having been doing remote learning for the past year and a half (since March, 2020). This anecdote and my reactions give a sense of where the students were.

After the first month or so of the fall semester, on October 7th, 2021, Sarah Cramer wanted to check in with the class to see what they remembered or knew from taking math last year online. I was surprised at how honest the students were in responding to this. Many of the students admitted (to the group) to not learning *anything* during the pandemic. Other students said the same thing within their small groups or even explained to Sarah Cramer one on one. Sarah responded by saying that it was okay and that everyone during the pandemic felt drained and stressed and were not able to learn as much as before. One student said, "I should have paid attention last year," and others said that they felt bad or guilty because now learning math in geometry is a lot harder. After learning this from the students it made sense that many struggled with working in groups again and even adjusting to doing work in person. After a few months students were able to learn how to work together and that they could help one another.

### **My Identity and Positionality**

In this section, I step back and reflect on who I am in this praxis project. First I discuss my role in the classroom and reflect on my insider/outsider status in this work, and how that

affects my interactions and interpretations of what went on in class. Then I discuss my race and identity, reflecting on my background and privilege and how that influences what I bring to this work. I discuss my family and educational background, and what has led me to want to become a teacher and do my praxis work in class with a teacher interested in Talking for Understanding.

### **Role and identity in Sarah's Classroom**

During the fall semester of 2021, I worked closely with Sarah Cramer, as her assistant and co-researcher. I helped work with the students on Tuesdays and Thursdays from 11:55-1:16, during the 6th period of the day. I also met extensively with Sarah, in order to determine what ways we could improve on her class and T4U. I observed the class and took notes on what the students said as well as helped around the room when they were working on independent or group work. When I worked with the students I asked them what they were working on. If they were struggling, I asked where they could start and what they knew, so that they could think among themselves or within their groups.

### **Positionality – Insider/Outsider Status:**

In doing ethnographic fieldwork (or any kind of research), it's important to reflect on one's positionality and status and how that might affect one's research findings. At Claremont Academy and within Sarah's class as my praxis site, I see myself as something of an outsider. The students that I am working with are all students of color, and I am a white woman. This is important to reflect on because acknowledging privileges I have and different experiences that I have had in my life help make me aware of how that impacts me and others around me. With knowledge of these privileges, I will never be able to fully understand the experiences of these students of color. However, I need to make myself a listener and supporter for these students with awareness of the privileges I experience.

With regard to my status in the classroom, it's important to take stock of my "role" – how the students perceived me – and my status as a math person. In Sarah's class, my sense was that the students didn't consider me to be a "teacher," but saw me mostly as an observer who was learning their subject just the same as they were. As I moved around the class, trying to help them with their work, the students quickly realized that I was not a math expert. I told them I was learning just like they were. I sensed that they felt more comfortable talking about their thought

processes with me because I was learning just like they were. In this sense, I was more of an insider.

Overall, my identity is very different from the participants within my site and understanding my identity and the experiences I have had within my education will help me to be more of a support system and helper during my praxis project.

### **Influences on me as a CYES Major and prospective teacher:**

In the spring semester of my freshman year, I began the course Complexities of Urban Schools with John Ameer. Beginning this course, I wasn't sure what to expect. I was still unsure of a major and career for myself. This course opened my eyes to education and teaching as well as broadened my understanding of the privileges I have had compared to others specifically in urban schools, like in Worcester. As the course progressed I learned a lot through our required readings and discussions during class by authors such as, Bob Herbert, Robert Rothstein and Robert Putnum. Each student in the course also had to volunteer a certain number of hours at a school throughout the semester. The first day volunteering in a second-grade class at Woodland (a nearby public school) was when I decided to be an elementary educator for my career. I fell in love with these students through the ways I was able to watch them learn and realized how important it is for young children to have an empowering education. These students' elementary education and the teachers they have – can impact the rest of their academic and everyday life. I knew after visiting this classroom that being a teacher was what I wanted to be--to be part of building the foundations of students' learning in their education.

### **Importance of Education for Youth:**

Education has been an important part of my life for as long as I can remember. My parents taught me how important it is to receive a great education, but I never understood until freshman year how much of an impact it can make on children. Our education systems are extremely different around the world but especially in the US, our education system is heavily impacted based on social class, income and wealth. The differences among schools within lower income areas and higher income areas are a source of social inequality. In higher income areas it is more often that the students will have more updated supplies and appliances within their schools, because families often donate support and resources to schools their children attend.

Higher income areas also have more income to support staff so that their students can attend after school programs. However, in lower income areas, parents and families do not have the luxury of being able to support their children in that way-- there are limited resources for after school programs and books for these children in these areas. They often have high turnover in staff, with little support for professional growth. The reason for this are the systemic barriers built within society such as redlining and wealth and tax distribution which prevented families from gaining wealth.

In my freshman year of college, I discovered an article that described school budget cuts depriving students of music and arts (Chira, 1993). This was the first time I realized the privilege I had to be able to receive a quality education where I was able to participate fully in the arts and music. I believe having outlets to express yourself as a student besides academics is extremely important. That being said, this is one of the contributing factors that pushed me to want to become an elementary school teacher in an urban school. The early learning stages are so important for children and to think that I could help build the foundation of young students learning in the future is exciting for me. I believe that quality education is important for all and that alternative subjects such as music, arts and sports are influential for students to find their outlet as a learner.

John Ameer's class pushed me to recognize the importance of empowering and equitable education in young students. I've seen how my peers, and students I worked with, struggled with restrictions because of differences in socioeconomic status, home culture, and race – and social inequality and racism is systemic in this country.

This moment drove me to acknowledge my privileges and made me ultimately want to become an educator to attempt to make a difference for these students as a source of support and empowerment in their education and future lives. My aspiration to teach youth comes from watching students take pride in learning something they never understood before. I am excited to teach so that the students that I teach can expand their knowledge and so they not only learn from me as a teacher, but from their peers as well.

### **Concluding Thoughts:**

I acknowledge that my life experiences (and my privilege) has brought me to who I am and what I believe in today. From being a student in John Ameer's class, I recognized what has

most impacted my life and in what ways I can use the knowledge from this class to see more clearly the injustices in the world and the power of education. I hope to be a source for change in my career as a teacher. This experience has helped me connect to the students in my praxis site, see them with deep regard, and to strive to be part of a nurturing and supportive classroom culture of talk, collaboration, and collective thinking.

### **Literature Review:**

#### **Situating Talking For Understanding in a Broader Literature**

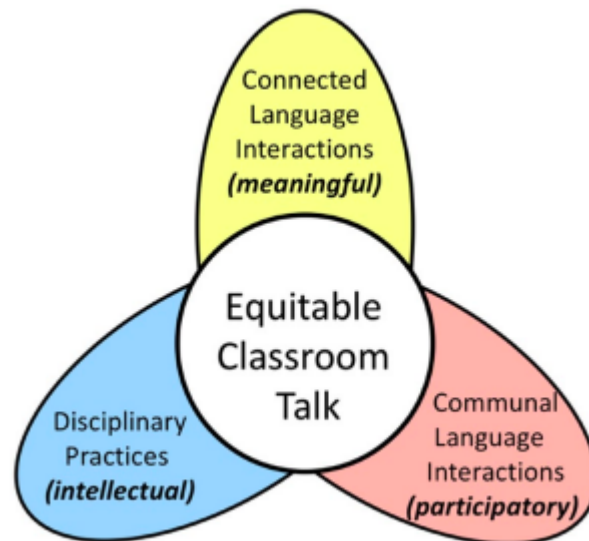
My research questions and the notion of Talking for Understanding did not just emerge out of thin air – neither for me or Sarah Cramer. There’s a long tradition of research and educational innovations that relate to classroom culture, student learning, and talk that has influenced Sarah’s work and has informed my thinking. In this section, I review some of that literature, and discuss it in light of my praxis project – how it relates to my work with Sarah and her students, and the research questions that guide my data analysis.

Over the past four decades, there's been a tremendous amount of research and scholarship on dialogic teaching, and classroom talk frameworks that are similar to T4U. There are many approaches with overlaps, similarities and differences in scope and focus. These approaches come from authors and educators in the US and abroad who have been researching and experimenting with forms of dialogic teaching. I discuss the work of several scholars who have been particularly influential in my praxis work, although in different ways.

#### **Teachers Learning to Implement Equitable Classroom Talk**

Jensen, Valdes, and Gallimore, (2020) write about the importance of equity and access in education, particularly with respect to emergent multilingual learners. What motivates their work is the fact that many students of color in low income areas, who may even speak more than one language, are not gaining access to the educational opportunities they deserve. They are marginalized in classrooms and their cultural and linguistic strengths are not recognized or leveraged. This group of scholars have been working with teachers to create a space for students to learn through rich discussions, talking to one another, and in ways that build on their linguistic assets (very similar to T4U). Jensen et al. (2020) propose a framework to support more equitable, expansive, and critical classroom talk, which has similar goals to T4U. They propose this

framework for equitable classroom talk as a tool that teachers can think with, and use with colleagues in planning and reflecting together on their practice. There are three principles undergirding Equitable Classroom Talk (see Figure 1 below) – which have helped me think more deeply about the principles behind T4U.



*Figure 2: Equitable Classroom Talk Framework  
(from Jensen et al., May 15th 2020, pg 2)*

The first principle is “connected language interactions (meaningful)” which means allowing the students to use their own everyday language (and home languages) in meaningful ways within the classroom to feel more comfortable and to bring their full selves to the classroom conversation. In Sarah Cramer's class there are students that work together or teach each other and speak in Spanish because that is how they feel most competent and comfortable. This is something Sarah tries to emphasize by writing all of her directions and activities in English and Spanish, and by allowing the students to speak freely in their everyday ways of speaking during discussions.

The second principle is “communal language interactions (participatory)” which is where students are working collaboratively and participating actively, whether in a large or small group setting, to grapple with ideas, concepts, and topics. In these participatory, communal language interactions, the teacher is open to students freely engaging in asking questions or discussing ideas and helping students feel agentic and supported in doing so. The difference between connected and communal language interactions is that connected refers to the language that they connect or use most, and communal is where the conversations take place regardless of what

language students feel comfortable using. For me this aspect relates centrally to the discussion and collaboration norms in Talking for Understanding. Sarah Cramer gives the students time to say anything that they can to try and understand the math topics that they are working on. She encourages them to put others' ideas into their own words, to explain their thinking so that others can understand them, and speak up if they don't understand something. Students in Sarah Cramer's class normally work in small groups and talk with each other as well as ask Sarah Cramer questions while doing work.

The last principle is “disciplinary practices (intellectual)” which is where students learn to engage in deeply intellectual work and talk in discipline-specific ways – with understanding – and feel comfortable doing this. That is, students learn to engage in academic discussions, blending their native languages with these disciplinary practices and feel comfortable explaining their thoughts or speaking on arguments. Teachers help to facilitate these conversations as well. This is what is developed through Talking for Understanding with Sarah Cramer facilitating math discussions. This article helped me to think of these key terms within my research and frame how I think about the main aspects of T4U, relating to norms for talk, collaboration, and collective learning of academic content.

### **A Dialogic Teaching Companion**

Robin Alexander's book called *A Dialogic Teaching Companion* (2020) provides a much more detailed framework for dialogic teaching which is used in providing professional development for teachers in large districts in the UK. He defines dialogic teaching as a mode of teaching designed “to stimulate and extend students' thinking, learning, knowing and understanding, and to enable them to discuss, reason and argue. It unites the oral, cognitive, social, epistemic and cultural, and therefore manifests frames of mind and value as well as ways of speaking and listening,” (Alexander, 2020, p. 4). Alexander identifies six principles of dialogic pedagogy, suggesting that when teachers engage their students in this way, they create classroom cultures that have very specific characteristics. These characteristics are, in Alexander's terms:

1. **Collective** (*the classroom is a site of joint learning and enquiry*);
2. **Reciprocal** (*participants listen to each other, share ideas and consider alternative viewpoints*);

3. **Supportive** (*participants feel able to express ideas freely, without risk of embarrassment over 'wrong' answers or "first draft" talk, and they help each other to reach common understandings*);
4. **Cumulative** (*participants build on their own and each other's contributions and chain them into coherent lines of thinking and understanding*);
5. **Deliberative** (*participants discuss and seek to resolve different points of view, they present and evaluate arguments, and they work towards reasoned positions and outcomes*);
6. **Purposeful** (*classroom talk, though open and dialogic, is structured with specific learning goals in view*).

Alexander's definition and set of principles remind me of what I think T4U does within the classroom, pushing students to learn and think critically as a collective, so that students deeply understand math and also learn to support each other's learning. As I continued to read the theory about dialogic teaching I began to see and understand that the practices that Alexander describes in detail not only seem to be what I am researching in Sarah Cramer's geometry class, but provide some very specific ways (strategies and repertoires) to help create an environment where "dialogic teaching" or "T4U" could happen.

Throughout this book Alexander explains how to develop dialogic teaching or how to make an environment to develop productive talk through justifications (describing the different types of talk within dialogic teaching), principles (which describes dialogic talk and how to plan to facilitate it within the classroom), and repertoires (which are examples to how to create an environment of dialogic teaching and learning).

Alexander's description of a set of repertoires for teachers relate directly to T4U. Alexander provides specific examples of talk structures and strategies that could be seen in Sarah Cramer's class, and I focused on these while observing. He describes different aspects of the classroom setting that can impact dialogic pedagogy within the classroom. Within this section it describes the varied participant structures within a class such as, the whole class as a group, small groups with the teacher, small groups led by a student, and individual groups with the teacher and the student and individual groups with student pairs. He also discusses grouping, how the size, student membership (friendship, gender, etc.), impacts productive talk (Alexander, pp. 12-13). This helped me reflect on Sarah's grouping strategies and struggles with the class



because there was a relatively large group of students who knew each other pretty well and talked a lot, and could sometimes work collaboratively, and sometimes not.

Another aspect of this section on repertoires was time – such as how long a lesson is and the balance between pace and talk about the instructions or topic (math in this case) compared to the students talking about what they are learning. This was also helpful in observing and making sense out of what was happening in Sarah’s class. Time was a constant challenge, because the lunch schedule caused a regular interruption during the middle of the class period.

The most helpful repertoire that Alexander wrote about was “learning talk” (the different ways that students talk when they are engaged in deep learning). Alexander describes eight different categories of learning talk: transactional, expository, interrogatory, exploratory, deliberative, imaginative, expressive, and evaluative. Transactional learning talk is when students manage discussions. This is considered transactional because it helps to maintain more “transactions” of conversation among the students and can be about the material in class. Expository talk is when students lead a discussion with their own explanations and thoughts. Interrogatory talk is when a student asks questions during a discussion whether it is about the problem or about other students' comments. Exploratory talk is when students start to come up with different ideas and speak about them. Deliberative talk is when students start to reason within the discussion and argue for a certain position. Imaginative talk is describing what they think an answer could be, not an exact answer. Expressive talk is when students are putting thoughts into words expansively and personally to describe their thinking. Lastly, Evaluative talk is when students are making judgments or expressing opinions within a discussion (Alexander, p. 15).

This information was important and new for me because it helped me think more critically about what I had witnessed in Sarah Cramer’s class and what things I focused on for my research. I had not previously thought about these different kinds of talk when observing students. These aspects of Alexander’s framework helped provide a lens for me to focus on while observing talk in Sarah’s class, helping me notice not only how the interactive settings of the classroom affect Sarah Cramer, but how they affect the students’ learning talk, if and when they engage in talking for understanding within discussions.

## **Talk Science Primer**

Another important article that related to my research was, “Talk Science Primer,” by Sarah Michaels and Cathy O’Connor (2012). This article focused on “Academically Productive Talk” (their term for the kind of talk that promotes listening, collaborative thinking, and public reasoning), and the ways that teachers’ moves and strategies impact teaching and learning. Many elements of this article relate to what Sarah Cramer does within the classroom. This quote is one of many that I could relate to some of the goals that Sarah has within her class: “Your ultimate goal involves helping students to share ideas and reasoning,” (p. 9). Talking for Understanding is all about students sharing ideas and reasoning, and how the teacher (Sarah Cramer) facilitates this sharing.

Michaels and O’Connor focused on 9 different kinds of “talk moves,” well designed talk tools that teachers can use to open up the conversation and create space for “academically productive talk,” the term they use to index dialogic talk in classrooms (Figure 3 below lists these productive talk moves, and the goals or challenges they help teachers address).

### **Goals for Productive Discussions and Nine Talk Moves**

**Goal: Individual students share, expand and clarify their own thinking**

**1. Time to Think:**

Partner Talk

Writing as Think Time

Wait Time

**2. Say More:**

“Can you say more about that?” “What do you mean by that?” “Can you give an example?”

**3. So, Are You Saying...?:**

“So, let me see if I’ve got what you’re saying. Are you saying...?” (always leaving space for the original student to agree or disagree and say more)

**Goal: Students listen carefully to one another**

**4. Who Can Rephrase or Repeat?**

“Who can repeat what Javon just said or put it into their own words?” (After a partner talk) “What did your partner say?”

**Goal: Students deepen their reasoning**

**5. Asking for Evidence or Reasoning:**

“Why do you think that?” “What’s your evidence?” “How did you arrive at that conclusion?”  
“Is there anything in the text that made you think that?”

**6. Challenge or Counterexample:**

“Does it always work that way?” “How does that idea square with Sonia’s example?”  
“What if it had been a copper cube instead?”

**Goal: Students think with others**

**7. Agree/Disagree and Why?:**

“Do you agree/disagree? (And why?)” “Are you saying the same thing as Jelya or something different, and if it’s different, how is it different?” “What do people think about what Vannia said?”  
“Does anyone want to respond to that idea?”

**8. Add On:**

“Who can add onto the idea that Jamal is building?”  
“Can anyone take that suggestion and push it a little further?”

**9. Explaining What Someone Else Means:**

“Who can explain what Aisha means when she says that?” “Who thinks they could explain in their words why Simon came up with that answer?” “Why do you think he said that?”

***Figure 3: Goals for Productive Discussions and Nine Talk Moves***

Each of these talk moves applies to four different goals that are important to achieve in discussions that promote learning. The first goal is that students have the time and support to “go public” with their own ideas – so that others can understand them. The first three talk moves can help with this goal. The second goal is that students are able to listen to one another, with focus.

The fourth talk move is helpful in getting students to do this. The third goal was that students are able to deepen their understanding of the topic, which can be supported with the 5th and 6th talk moves. The fourth goal was that students are able to think with their peers, which relates to the rest of the talk moves. I used this set of talk moves as lenses, in listening to what Sarah was saying, and also to think about the goals or challenges Sarah was working toward at any given time in a discussion. It's worth noting that Sarah was familiar with this work on Academically Productive Talk, and had been working with these moves for many years. She was particularly interested in working on Goal 2 (listening) and expanding her use of the rephrase/repeat talk move (Talk Move 4) – “Who thinks they can put what X said into their own words?” – to build a culture where students listened to each other, engaged with each other's ideas (whether correct or incorrect) and learned from one another.

## **Conclusion**

These frameworks by Jensen et al, Alexander, and Michaels and O'Connor helped me to think about the key aspects of my research on Talking for Understanding and helped me to focus my research on certain aspects within Sarah Cramer's classroom. The Equitable Classroom Talk article helped me to realize the different dimensions of T4U (meaningful talk, collaboration, and mathematics content) as I am learning more about it. The Alexander article helped me focus on certain structures within Sarah Cramer's classroom and what I should focus on while observing. The Talk Science Primer helped me notice the elements and talk moves that are currently in use within Sarah Cramer's classroom and which were less common, and could possibly help improve the talk in her classroom. Taken together these articles have been helpful in guiding my observations, formulating my research questions about T4U, and making sense of the talk I observed, and the students' perceptions of talk in Sarah's math class.

## **Conceptual Framework:**

Throughout my research the framework that I followed was based on three themes that I believe to be critical for developing T4U within the classroom. These three themes are: classroom norms, classroom collaboration and collective understanding. In my opinion these themes create the foundation of what is necessary for students to be able to have helpful conversations with one another (T4U). My first theme is classroom norms and I believe it to be

important within all classrooms. I think that within a classroom student need to be aware of what is expected of them from the teacher as well as each other when talking and reacting during class time. These “norms” or conditions within the classroom are the standards that the teacher and students have to hold for themselves. With knowledge of what is expected of them students should be able to know how to respect their peers and their teacher within the classroom. I noticed with this class that it was more difficult to maintain these classroom conditions because of certain students within the class that tended to tip the classroom environment off balance with off-task talking or speaking over one another instead of listening. These classroom norms relate to Jensen et al. 's work because they attempt to give students expectations within their classroom conversations to make their students more comfortable to talk by using their own native or everyday languages. Alexander’s work also relates to this part of T4U because he describes that dialogic pedagogy is affected by the classroom environment and how the class is grouped (whole class, groups, pairs, individually) and whether students are friends or not. This directly relates to T4U and what I believe helps students to learn and understand from one another because having these expectations known helps students to know how to act within the classroom and helps students to be able to trust one another. Through my research I will document Sarah Cramer’s process of creating and maintaining classroom norms with her students.

The second theme that I used as a lens through my research was classroom collaboration. In order to have T4U within the classroom students need to be able to help and talk to each other whether it's in a whole class or a small group setting. Through this research I will observe how students work with one another within the classroom and how they build trust with one another. When students speak about how they solve a problem or their ways of thinking (especially in math) many may feel uncertain or less confident. While observing I want to see what helps students to talk or want to help one another within the classroom. I also am curious to see how the confidence of students in math may affect their willingness to participate. I will document how students feel about participation based on observation notes within class, a student survey and through student interviews. Sarah also helps students talk or work together within the classroom by using certain strategies or talk moves such as wait time, asking a student to rephrase or repeat what another has said as well as some others. This relates to the nine talk moves within Talk Science Primer because Sarah Cramer uses several of these talk moves to encourage students to talk or share what they have figured out within whole class discussions or

in their small groups. I will be documenting what talk moves that Sarah uses and what I think students react to during the time that I work within the classroom.

Collective understanding is the final theme that I believe creates the foundation of Talking for Understanding. Collective Understanding to me is when all students within a class or a group all come to understand a certain topic together. I think it is really important for all students to understand each topic although it is extremely difficult to achieve at all times. When students work together they can each be held accountable to help make sure their peers understand what they are learning in class. I will first document this within the classroom by observing how students help one another within the classroom. Later on during the year I will ask students through a survey whether they help one another understand things within the classroom. After the survey I will dive further in these survey responses to try to understand the students' view by asking them to say more on what they think in student interviews. This aspect of Talking for Understanding is not one that I have heard or read about from any theorist so far, but Sarah Cramer and I believe it is important that all students come to understand topics that they learn fully and that students within the classroom should help one another to understand and should want everyone within their class to succeed. Through each of these three lenses I hope that I will be able to use what I find in my research to figure out how to implement this within other classrooms.

### **Methodology and Methods:**

#### **Ethnographic Approach**

For this praxis project my general approach has been ethnographic, as a participant observer. John Brewer describes ethnography as, “a style of research that is distinguished by its objectives, which are to understand the social meaning and activities of people in a given “field” or setting.” It also means that I am active within this setting and have a close association with participants within research (Brewer, p. 11, 2000). This approach helped me not only to know the students better, but to notice those in the class who participated most within conversations and those who didn't. While I observed the students, I noticed what activities, tasks, assignments or ‘talk moves’ worked best for student learning and collaboration and which things were not as helpful. I was able to discuss with Sarah Cramer which things worked within the class and talk together about how to improve the classroom talk or help students collaborate better. In my role

as participant observer, I was able to collaborate with Sarah as a co-researcher, helping us both understand what aspects are important in order to develop T4U and which approaches helped and did not help students. As an ethnographer, in writing up this collaborative research, I hope to share the challenges and success of this approach with other teachers interested in dialogic teaching.

### **Data Collection Methods**

In this section, I explain the kinds of data I collected. My sources of data were audio recordings of full class sessions, my in-class observations, analytic memos, Sarah's daily reflections, a February, 2022 student survey, and three student interviews. In what follows, I describe how each type of data was collected and organized.

#### **Class Session Recordings:**

Sarah Cramer recorded her whole classroom discussions and I used my phone to pick up recordings within small groups. Each class was recorded (except for a few where the equipment failed), with the hope that we would be able to transcribe moments where T4U was happening. Overall, we collected over 20 audio files. However, the recordings turned out not to be usable. The noise within the class, with students often talking over one another, meant that they were impossible to transcribe, whether talking for understanding was happening or not. This was due to the fact that it was incredibly difficult to have whole class discussions within this class because of their schedule, some students were really loud and would frequently talk off-task. Generally, most of the productive discussions that happened within the class (if there was any) happened within small groups generally with three students each. Since there was only one recorder and it was placed in the front of the room it was increasingly difficult to collect helpful discussions. After some time, I attempted to collect data from small groups with my phone, but that also became difficult because I would go to different groups within the class and would still pick up other conversations of other students and I would miss certain parts of the discussion as I walked around.

## **Observations to Analytic Memos and Analysis**

Each class session, I collected observation notes, which included important quotes that I heard in a spiral notebook. I reviewed these notes (on a weekly basis) and used them to generate analytic memos where I would talk about the parts of the classes that I found the most important or interesting. These notes and memos helped me to remember the events of each class and whether certain classes had more productive talk than others.

In working with this data, I read through every note and highlighted aspects that related directly to my research questions: places where students were working independently or together (and qualities and direct quotes of collaboration); places where Sarah used particular talk strategies, wait time, and particular talk moves such as “Do you agree?” to get students to talk to each other. I made notes of patterns of collaboration and Sarah’s strategies as well as changes over time.

## **Interviews with Sarah and her Daily Reflections**

I interviewed Sarah Cramer before the start of the school year to fully understand the ways in which she prepares to teach and attempts to promote Talking for Understanding. I also talked with Sarah Cramer informally weekly (after class sessions). After each session, Sarah emailed me with her reflections – with three questions that I had given to her at the beginning of the year. In each email she’d answer each question:

- 1) *Were there specific/favorite moments where you sensed T4U was happening?*
- 2) *What did you struggle with/or were there puzzling moments?*
- 3) *What do you want to work on for next class?*

I organized these emails into one google file (with dates), and reviewed alongside my own analytic memos (which I wrote without having first read Sarah’s reflections). In working with both Sarah’s reflections and my own notes and memos, I noted patterns of agreement and also differences in what we noticed. I paid special attention to student collaboration, and times where Sarah noted improvement or particular success, and reflections on things she wanted to try out or change.

## **Student Survey**

In the spring semester (late February), in part because I had no audio data to work with, I created one student survey asking about class norms, participation, and whether students in the



class helped others or not. I made a big point about wanting them to be honest so I could learn from them how they felt. I wanted to hear from the students to see what helps them learn within the classroom and what they think is important while learning as a group together. The survey included both multiple choice questions as well as open responses. They included the following questions:

- *Do you learn math better in Ms. Cramer's class by listening or talking?*
- *What is your level of comfort in talking about the math you did in class this week?*
- *Have any students in the class helped you understand the math this week? If so, give an example.*
- *Have you helped other students in class to understand things this week? If yes, can you give me an example?*
- *What do you think about Ms. Cramer's classroom norms and the overall environment within class?*
- *How confident are you in math on a scale from 1(low)-5(high)?*

I read through all of the responses (in an excel spreadsheet) and noted both class patterns as well as patterns within individual students, and surprising or particularly illuminating responses. These were illuminating for both me and Sarah, and helped me figure out what questions I want to ask students about in more depth in individual interviews.

### **Student Interviews**

At the end of my data collection in March 2022, I wanted to interview students. Many wanted to be interviewed. But, because of time, I selected three students (who volunteered and had parent/guardian consent) who differed in many ways. One spoke Spanish and did a lot of translating for others in the class. One was shy but seemed confident in math. One, who participated in class, but seemed less confident in math.

I talked with the students for approximately 10 minutes each, during their lunch period. I asked each student around 5-7 questions to understand what they thought about classroom talk and norms and participation in Sarah's math class. The questions that I asked the students were:

- 1) *Do you feel like you participate often in Ms. Cramer's class (in whole class or group discussions)? Why or why not? Can you give me an example of when you participated a lot, and why do you think you did?*
- 2) *What makes you feel comfortable enough to participate? (What makes you feel comfortable enough to participate? Is it because of the class environment?)*
- 3) *What would you change about Ms. Cramer's class norms? (said you like them, students don't follow them... What would you suggest?)*

- 4) *How confident are you in math? Why is this? (do you feel comfortable in all of your classes or specifically this one?)*
- 5) *How important is it for you that your classmates understand the math concepts and topics within the class? Why is this?*
- 6) *Do you help other students in class to understand things? Can you give me an example? Do they help you? Can you give me an example? Do you think helping others or others helping you helps you learn more within class?*

I transcribed the entire interviews with students. I highlighted parts of the interviews that seemed most relevant to my research questions – particularly places where they talked about what they thought about classroom norms, what helped in their own learning, and how they felt about having all students understand a topic in class.

### **Findings:**

In carrying out my praxis project, I paid close attention to student interactions and Sarah's teachings. I sought to understand both challenges and how particular activities, grouping strategies, and student and teacher talk contributed to Talking for Understanding or productive collaborative conversations or not. In this section, I describe what I saw and what I learned, focusing on three key elements of Talking for Understanding: Classroom Norms, Classroom Collaboration, and Collective Understanding. These three elements emerged (over time) as key to my *own* understanding of what helps develop Talking for Understanding in the classroom. In each section, I provide background, examples, and commentary to demonstrate what I learned from Sarah, my observations, and the students' perspective on learning and collaboration.

#### ***Classroom Norms:***

In what follows I explain what I came to learn about the importance of classroom norms for the development of T4U from Sarah, my own observations and the students. From the beginning of the semester I noticed the ways in which Sarah Cramer was developing the skills for students to participate in Talking for Understanding. A huge part of this involved establishing norms. I came to see that building a classroom culture for talk is a long and complicated process. In some classrooms some teachers develop these expectations or rules by themselves and present them to their students. In Sarah Cramer's classroom she does something different.

During the first week of school, Sarah had the class develop their *own* class norms to follow throughout the year. She did this through an activity called “Home Court Advantage.” In this activity (which lasted a couple of class periods), she first had students talk about their personal experiences with sports. Then she had them look up statistics, in general, of sports teams win-loss records when they were playing at home versus away games. The class noticed that teams typically win more games at home. She told them that it was called “Home Court Advantage.” The class then discussed why that happens. Sarah explained that she wanted this class to be the place where they can all succeed more than anywhere else. She then had her students break up into groups and write and draw on posters what they thought it meant to have “Home Court Advantage” within this math class. Below are some examples of the students’ work (Figures 4-6).

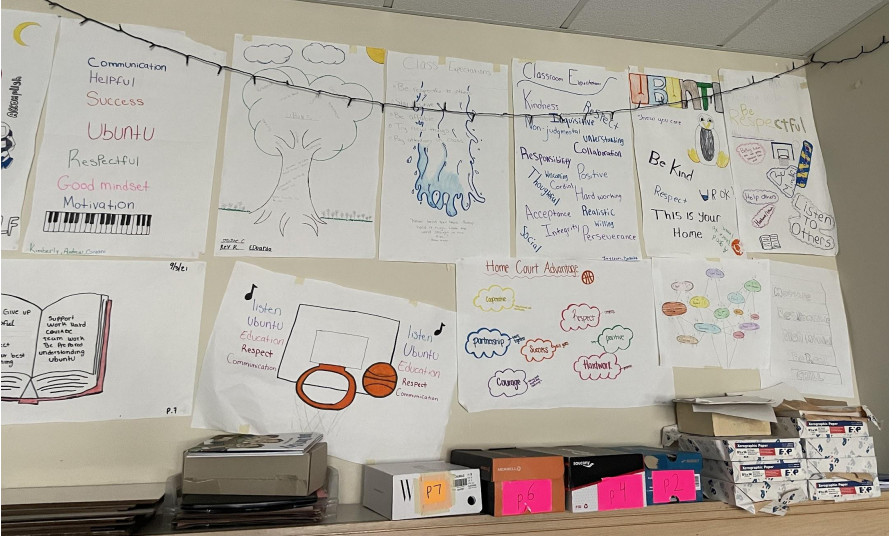


Figure 4

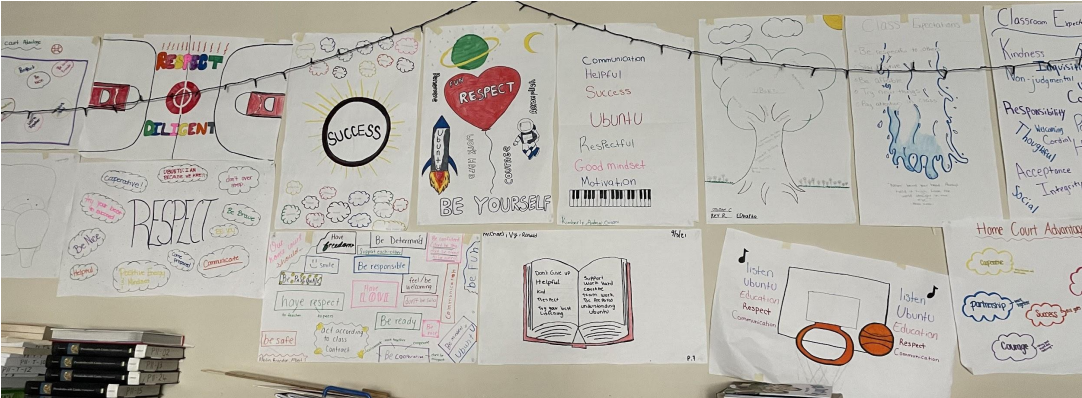
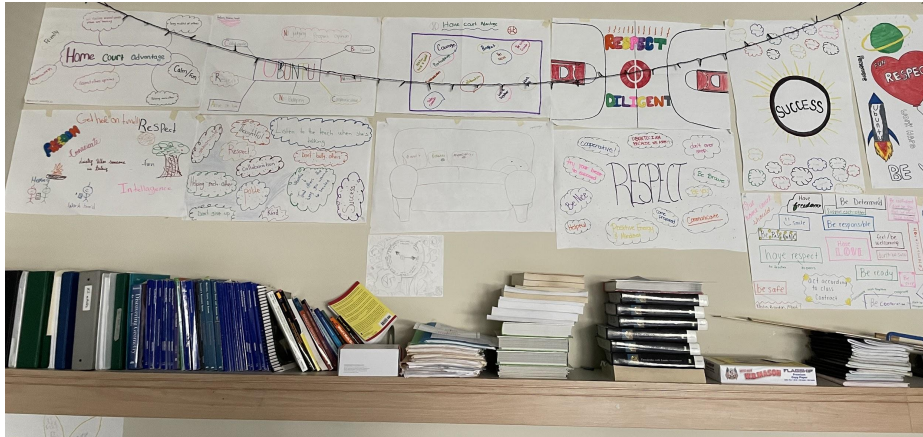


Figure 5



**Figure 6**

After the students created their posters in groups, students walked around and did a “gallery walk” of what everyone within the class came up with. Then they wrote down from what they saw within the posters what they wanted to include within the classroom contract that they created later together. Sarah Cramer then brought the class together to share out loud what they wanted to include within their classroom contract that they all will agree to follow. Sarah typed up as students shared and had students elaborate on what they thought so that they would have specific language within their contract that everyone understood and agreed to follow.

The classroom contract that the class that I work with came up with is:

### **Period 6 Classroom Contract**

We, Ms. Cramer’s Period 6 Geometry Class in the 10th grade at Claremont Academy, hereby commit to showing respect to ourselves and one another. To do this, we will:

- Uplift each other by staying positive, having a good mindset, and complimenting each other
- Have the courage to participate, answer questions, and take risks
- Stay motivated by pushing each other to succeed and helping each other
- Cooperate with each other when working in groups
- Keep a good mindset so we are mentally prepared for class
- Listen to each other
- Not talk while other people are talking

- Support each other
- Show diligence by trying our best and pushing through our work
- Persevere even when it's tough
- Show adaptability by being able to change for different situations
- Work hard to finish all our work
- Practice selflessness by not just think about ourselves but thinking about others too
- Communicate with each other so we can express ourselves and work well together
- Be ourselves
- Ask each other and the teacher for help
- Strive for success

**Commentary:**

As you can see from above there are a lot of aspects of this contract that would help create a respectful, classroom where students can support one another. “Support each other,” and “Not talk while other people are talking” are two very important rules within this class that I think took them a while to follow, and some still struggled to do this from time to time. The parts of the classroom contract, “Communicate with each other so we can express ourselves and work well together,” and “ask each other and the teacher for help,” are two of the main points of what I found within my findings was that students had to come to learn within this classroom. Communication and asking for help correlate with cooperating or collaborating and learning together as a class which is extremely important for developing T4U. Many students within their posters included the term “Ubuntu” which is the school's motto meaning “I am what I am because of who we all are.” This concept is interesting to me because it makes me think about how people can change based on the classes or communities they spend their time in. Having this motto makes me feel like all students should be working together and respecting one another to reach their own goals and succeed. I believe this based on the definition as well as if they believe this motto to be that important to them that they presented it within a poster, I would expect them to demonstrate this within their classrooms.

Another aspect of the classroom norms is that Sarah Cramer also believes that it is important to refer back to the contract twice each quarter so that she can personally reflect as well as have her students reflect on how they are following or not following their classroom

contract. She does this through having them reflect on how they have been doing individually within their journals for a classroom starter. For this class she noticed gradual changes over time and it wasn't until the middle of the second semester that the class as a whole was making progress as a classroom environment instead of the same few students who would do well.

This classroom contract the students created can also relate to Robin Alexander's Principles that I previously discussed in my Literature Review. The first three principles: Collective, Reciprocal and Supportive are all things that I feel apply to what the students developed within their contract. "Cooperate with each other when working in groups," relates to the collective because students work together and learn. "Communicate with each other so we can express ourselves and work well together" and "Listen to each other" relates to the reciprocal principle because students are talking and listening to each other to understand each other's views and thoughts. "Uplift each other by staying positive, having a good mindset, and complementing each other," relates to the supportive principle because this helps students to feel supported within the classroom and more comfortable to speak their thoughts.

There was one class that I observed on September 23rd, 2021 that I noticed some really encouraging talk and "Supportive" principles from students that I had not heard before within the fall. What was interesting about this was it did not seem to continue into later classes that I observed. The students were playing a game called "tape ball" that is where students are separated in groups and each attempt to answer problems that Sarah Cramer gives them. The groups that get the answers correct can attempt to get more points by throwing a tape ball into a can, depending on how far away you throw you can earn more points. I believe that the competition of the game got the students excited and focused on what they were learning, because this class was unlike any other in the fall and after this class I did not witness great conversations really until after winter break. There was a student who said, "What in the world--I suck at this. I just don't understand," and to respond to this student another student said, "It's okay you will get it next time--You're still a winner." This was a new interaction for me at the time because I had not been able to see students supporting each other really in the classroom throughout the semester, but because this activity was set up as a game, students seemed to support each other or act more "sportsmanlike".

## **Learning From Students about Classroom Norms**

There was a lot of information from students about classroom norms through the survey responses and student interviews. One of the survey questions from 2/17/22 was about classroom norms and it said, “What do you think about Ms. Cramer’s classroom norms and the overall environment within class?” Around 9-10 students did not have much to say and said that they liked it or that they thought they were “good” or “fine” norms. A student named Joshua mentioned, “I like it a lot because it makes me wanna learn.” I found this comment interesting because while observing I haven’t noticed students talk about enjoying learning within school, especially within math. However, there were also three negative comments about how the students reacted to the norms within this class, because these students agreed they were not following or respecting them. Another student, Mara, said, “I think the norms are great and easy to follow, it's just the students that don't follow them even after signing them.” Some other students had similar feelings about how their peers acted within class. Another student, Harper said, “people are scattered everywhere and chatting about other things than work...Most kids are respectful. MOST of them.” Harper described how students are doing things that are against what they agreed on within their classroom contract.

### **Commentary:**

Personally, I feel like while observing this classroom over the past year I have witnessed this class having trouble with giving respect to others because they talk over one another, or had trouble helping one another at first. Most days within my observation notes I noticed there were many absences from class every day, (nine absences on one day in the fall) and this not only affects those students' learning but makes it difficult for students to learn how to trust one another if students are not there every class. The students had to learn how to help each other and sometimes still struggle with giving respect to those who are speaking. I didn’t notice students beginning to really work well together until late October, early November and even then students still struggled with speaking over one another. These things are rules that they came up with for their classroom contract and seeing these negative comments demonstrated to me that there are still a few in the class who are not putting into practice what they agreed to act like within Sarah Cramer’s Classroom. Sarah attempted to help students act better within the classroom to respect her and their classmates by having one on one conversations with certain students who tended

not to follow certain rules and to review the contract with students twice each quarter. When I came back after winter break in January, there was a distinct difference within the classroom that I had not witnessed and at this time most students were being respectful within the class and there was even one instance when some students stepped out of line by talking over another student who was sharing out to the class and that student apologized to Sarah Cramer and the student and they began to listen to what their peer was saying. These instances exemplify that maintaining classroom norms with certain classrooms (ones that may seem more difficult to manage within the classroom) takes lots of time and practice as well as relationship building between the teacher and the student.

### **Learning from Sarah on Classroom Norms**

After seeing this student feedback, I reached out to Sarah Cramer to explain to me the Classroom norm process and the difficulties she specifically struggled with for this class during the time students were having lunch. Sarah Cramer explained how this class specifically struggled with taking the classroom norms seriously compared to her other classes. Even though Sarah Cramer had the students reflect twice a quarter on their classroom norms; students within this class still sometimes struggle to not talk over one another or maintain the classroom contract. Sarah Cramer mentioned that what she thinks could have helped this class specifically would be taking the time during one class to talk and attempt to “get it together.” Sarah realized that some students' actions have been affecting the whole class so having a class to talk about that may force all students to realize the impact they have on others. Sarah Cramer also mentioned that the reason that the class started to demonstrate respect was when she made better relationships or connections with the students individually during one on one talks. These relationships helped Sarah and the students because then students began to trust and respect her more which meant they were more inclined to follow the classroom contract more strictly. Sarah Cramer also mentioned that after winter break she personally felt she had a better mindset for teaching which also made an impact on the class. Teachers especially after COVID-19 are burnt out and need to have breaks so that they can feel more confident teaching within the classroom again even though their students have been taking more time to adjust after the pandemic. I cannot speak about how Sarah Cramer may have been feeling about teaching before, during and after the pandemic, but I can imagine that it has been extremely draining and difficult to learn how to



once again teach in person after so much time. Overall Sarah Cramer realized that connecting one on one with the students in this class helped students to respect her as well as their peers within the classroom. She also noticed that students needed time to adjust to being within the classroom environment again and relearn how to act professionally when they are around their friends in class.

**Commentary:**

Throughout this year I had never realized how important classroom norms can be to have comfortable conversations with students within the classroom. Having classroom rules and understanding what is necessary to respect your peers and teacher in class is extremely important and is a major part of creating a welcome learning environment where students can trust one another and have the courage to speak about what they think about a certain topic. This learning environment is required in order for T4U to happen within a classroom. If students feel uncomfortable within a class or with other students they are less likely to speak up or ask for help in class and won't be able to have meaningful conversations with other students that could lead to understanding some math topics.

After the COVID-19 pandemic I think that classroom communities and classroom management for teachers in all grades became extremely difficult. Teachers are burnt out and in order to keep their students respecting each other and their classroom teacher is through having classroom norms. Although classroom norms may take time to maintain or for a class to grasp, I think it is extremely important to have students participate in coming up with the rules of the class (like Sarah Cramer has done) because it makes most students feel ownership of them and could even help them to remember or follow them better than they would by just being given rules. In order to have productive classroom conversations and elements of T4U within classrooms it is extremely important to have classroom norms in place to create a comfortable classroom community. From Sarah I learned it's important to use some type of classroom activity to get your students involved with coming up with their own rules. This helps to bring classroom norms or rules up within the classroom in an alternative way instead of having students talk out in a whole group. I realized that although students came up with their own rules the most important part is talking and reviewing them with students because then they realize how important it is for not only the teacher but peers within the classroom.

## ***Classroom Collaboration:***

### **Intro:**

*Classroom collaboration* is where students are able to work together as a class and have the ability to collaborate their ideas and skills with one another. This is important to developing T4U within the classroom because if students are not working together then they will not be able to use their peers' ideas, or to speak their thoughts out loud to *understand* a topic *together*. Within this section I explain through my own observations of the class, Sarah's reflections and student feedback how students feel about working together.

### **Student Check in on Classroom Collaboration:**

In class on October 14th Sarah Cramer did another activity to see how the class was learning, or if they were helping one another. The "starter activity" (the first relatively brief activity of the day – when students first walk in) was not a math problem, which is typical. On this day, Sarah asked a question about learning math, and the students had to stand in a certain section of the room to say yes, no, or maybe (or a lot, a little or not at all). The first question was whether the students had learned something new in class so far and most of them agreed that they had. The second question was whether they were trying hard within her class. In response to this question, students were divided more equally – working very hard, only a little, or not at all. The third question was if students had gotten help from other classmates during class, and only one person said yes. This made sense to me according to my observational notes because most times students would work by themselves at this time or with the friends that they knew in the class. More often students would constantly ask Sarah Cramer for help instead of peers around them. It wasn't until the middle of November that students were inclined to help each other or Sarah would ask certain students to help or share to others what they had found. However, this activity demonstrated to me how much Sarah is trying to see how effective her teaching is, and helped her figure out what was necessary to change so that students can receive the help that they need in order to build an environment for Talking for Understanding.

### **Commentary:**

What I noticed from the third question was that most of the students are not helping one another which is a huge aspect of Talking for Understanding. When talking one-on-one with

Sarah we discussed how different the classroom was in person compared to learning during COVID-19 especially because students were mostly working independently. We wondered if it was possible that because of all of that time learning online if students were used to working independently, or didn't remember or even think of working with their peers.

After this Sarah wanted to come up with ways that the students would be able to work as groups or with their peers again, to attempt to build elements of Talking for Understanding. This discussion with Sarah made me realize that the students have a lot to learn within the classroom before there can even be the possibility for T4U. Students need to learn how to trust others within the class and how to respectfully talk to one another. Sarah knew she had to make changes so that students would know what it was like to study in the classroom again after COVID-19 as well as how to work with your peers to help learn problems within class as well. This portion of data relates to my research questions because it demonstrates the strategies that Sarah Cramer is using such as listening or hearing feedback from students to know in what ways to help them. This also shows the ways in which students are reacting to her teaching, meaning how they respect her or whether they think what they talk about in class is important.

Through my observation notes I was able to see a lot of growth from the beginning of the school year with classroom collaboration. The first time I noticed Sarah implementing these structured jobs for class activities to encourage students to work together was on November 18th, 2021. On this day they were playing a geometry pictorial game where within their groups one person was a timer, one person was a drawer and one person was the speaker for their group. Although the class was loud I wrote that each student was focused and determined to find the answers for their group. It was one of the first times that I witnessed the students in this class enjoying a group activity that actually helped one another. Later on in the year on February 3rd of 2022 there was an interaction between two students. One student mentioned, "I am working on number 16... but I don't know man I am not that smart..." The partner student he was paired with for this packet responded with, "What if you helped me with my work and I help you with yours?" This demonstrates huge growth from the beginning of the semester when students would normally only work by themselves or their closest friends on problems and only ask Sarah Cramer for help. This was also a shocking moment for me because before I left for winter break I had not experienced students really speaking that vulnerably to their classroom partners, only

normally the closest friends within the class. I realized that working together within the classroom not only helped the students to learn, but to talk comfortably with their table partners.

### **Learning from Sarah's reflections about Classroom Collaboration**

As mentioned in my Methodology and Methods section, p. 21, I began collecting reflections from Sarah Cramer in late September with three questions (Were there specific/favorite moments where you sensed T4U was happening? What did you struggle with/or were there puzzling moments? What do you want to work on for next class?). After the class on the 14th of October Sarah mentioned, "I'm noticing this year's students are really unaccustomed to helping each other, I think from being a part for so long. Yesterday I did a better job of asking specific students to help other students and that seemed to help, but today I didn't see much natural help outside of their groups." Natural help meaning students who naturally help others without Sarah asking students to do so first. Sarah Cramer mentioned how she noticed students in this class (after COVID) had trouble with asking or getting help from peers in class. Within this reflection she also described what she did to encourage the behavior of helping peers in the classroom. She also mentioned she would, "create more structures/ roles in the class for that, or have them use their resources like notes more to help themselves through a problem." By creating roles or jobs for groups of students to do within the classroom will not only help them to collaborate together but will help them work with students within the class that may not be their friends, or someone they normally talk to. Later on on November 16th, Sarah Cramer told me that after giving her students group roles such as for each assignment (each student at a table responsible for a job necessary to complete class activities) helped students to work together and ask each other questions as well. This is an example of how Ms. Cramer tried to push students towards collaboration within her classroom, and I noticed the change when those students decided to help each other through their math problems in February. This is one of many examples of ways that I learned from her how I can help benefit students within my classroom to talk or collaborate with one another to attempt to develop T4U. I acknowledge through this research process that it will be a challenge to do so and that it will take time, but I know that it is important for all students to work together to come to an understanding on class topics.

### **Students Helping Each Other: a Breakthrough**

One of the most important classes I have experienced this semester was on October 28th because it was the first time that I was able to witness or document students helping one another and led to something that was close to a bigger class discussion where Talking for Understanding was happening. In this class they began with a starter activity to determine the angles of a polygon. The students were seated in pairs and were told to first work on the starter independently then share what they found with their partner. After a few minutes the class came together to discuss what they found as a whole group. Students answered the question, and Sarah Cramer used certain talk moves to get more students to rephrase what other students had said. She asked one student “Can you rephrase what Wilfredo said?” Sarah Cramer did this to make sure the whole class were all understanding how they came to their answers as well as what Wilfredo had said. Sarah used wait time for a few minutes to wait for students to think before Lilian offered to explain. Lilian in particular, who was absent a lot, said, “Miss I am kinda shy,” before explaining her answer. This was interesting because Lilian normally talks a lot with peers. This could be because she was not confident speaking her answers out loud, but I was glad that she did because throughout this class I noticed her becoming more comfortable. I knew this to be true because when she started to explain her answer she was talking very quietly and as she seemed to become more confident she began to talk loudly and was speaking to her peers not only towards Sarah Cramer because she understood that students were attempting to listen to how she found her answer. After she explained the answer to this problem the class moved on to work on the next problem independently at first. There was a point where some students were helping one another on these problems and a student named Manuel asked Lilian if she needed help and she said “Hold on, I just need a minute to understand,” in response. This also made me feel like she was feeling more comfortable within the class because she was able to voice that she needed a moment to gather how she was thinking about the problem.

### **Commentary:**

This was one of the first times Sarah Cramer or I noticed effective communication and collaboration from students in this class. There were even some students in their pairs teaching each other how they answered their problems, or how they had shown their work.

This example of data was important to me because it was the first time Talking for Understanding could really be seen within the class, and it was also the first time I noticed students working well together. I believe this was a great class that had T4U because Sarah had been able to create relationships with students in class (such as Lilian), especially the students who would normally cause disturbances during class. The way Sarah created more of these relationships with students was through talking one on one and checking in with her students. Also, during this discussion Sarah was able to help push students to think and rephrase their peers' thoughts for the whole class to understand. This was one of the first times I noticed Sarah Cramer using this “rephrasing” talk move and it made an impact on the classroom conversation in this class. It was really great to see the thinking process of Lilian and hear her admit she needed time to understand what they were working on. A possible contributing factor to this success was that the students also were able to choose their partners for today's class, which is great that they were able to work well together. Normally in class Sarah assigns partners because students usually have trouble staying on task when working with their friends. Sarah Cramer continued to mostly assign partners in class because she wanted the students to be able to learn how to work with others that may not be their friends later on throughout the year.

### **Student Feedback on Classroom Collaboration**

The students within Sarah Cramer’s class also gave feedback through surveys and interviews about how they work with other students within the class and how it helps them. Ten out of 17 students within the surveys said that they received help from students in the class and those who did tend to mention their friends or people they usually talk to. These results make sense to how students act within class because students tend to only talk to people they are friends with most of the time, unless Sarah Cramer asked someone to help another student or if she gives groups certain jobs. In an interview with Mara, she mentioned that because she was switched in the middle of the year into this class she did not feel comfortable talking to others within the class because they were not usually people that she talked to or hung out with. Mara also mentioned that she tends to learn problems on her own in this class because she “doesn’t like asking for help,” although she admitted that asking for help is important in any subject in school and in life. Since being in this class, Mara mentioned that whenever she finished her work she would help other students if they needed it. For example, when Sarah Cramer asks her to

help another student she goes over to help them by comparing their papers and talking through how to solve a problem. Sarah's facilitation helped push Mara to work with other students and helped her to talk through solving problems with a partner.

I had a second interview with a student, Joshua, who is generally really talkative in class with most class members. He mentioned he gets along well with most people in the class and feels comfortable talking or helping people because of the classroom environment as well. Joshua also mentioned, "helping people is kinda in my nature," because he enjoys working with peers within this class. However, Joshua also mentioned that he doesn't often receive help from others within the class and tends to help himself or get help from Sarah Cramer instead. This is interesting to me because Joshua provides help to others but doesn't always get it back in return, I hope that this has changed since I interviewed with him.

My last interview with Wilfredo included how he feels comfortable talking as a whole class but that he feels more comfortable collaborating in smaller groups because students are able to hear what he has to say and, "the attention is mostly focused on me," whereas, within whole class discussions there are students talking over one another and not listening to Wilfredo when he talks. Wilfredo also mentioned several students that have helped him with certain math topics within class from people who are sitting within their table groups in class. This made me realize that the seating within the class can be helpful to students because it may force them to ask questions or talk about their assignments together.

The feedback from the students within this class demonstrated to me how much students care about their social aspects of school. I noticed students cared a lot about being able to talk with their friends or working with them instead of people they would not normally work with. Within this 6th period class I noticed most students would gravitate towards their friends and only a few students tended to help people within classes that they don't really know.

### **Commentary:**

Classroom collaboration is something I find to be extremely important within every academic setting and something I wish to replicate within my classroom one day when I teach. Being a witness to students after COVID-19, I realized how important it is to have the skills to communicate with peers as well as ask for help. In this class especially, it didn't seem to me that students felt comfortable with working together with other students in the class altogether until

later in the year. In my opinion I figured that communicating with peers in class was something that would come easy to students because they have gone to school with each other for a long time.

Through this experience I realized that students' friends are the people they feel most comfortable with and that teachers should help them through finding a medium where students are pushed to work with others they don't know even though it may be out of their comfort zone, as well as giving the occasional time to have students work or choose who they work with. When students within a classroom finally reach the moment that they can effectively communicate and collaborate with one another during class activities, that is when T4U is possible. Although I think it is important for teachers (like Sarah Cramer) to continue talk moves that help develop T4U while students are still adjusting to classroom norms. In this way, students will be simultaneously learning how to talk and collaborate their thinking with others as well as understanding what is expected of them within the classroom. When students comfortably communicate and work together within a group setting, students are one step closer to helping each other learn together as a group and reach full understanding (T4U!).

### **Concluding thoughts:**

I witnessed in Sarah Cramer's classroom that in order to have episodes of "Talking for Understanding" the students as well as the teacher need to respect each other, listen to each other, and know how to work together. During the course of this year working with this class with Sarah Cramer, we noticed many of the students struggled with asking for help or with working with their peers. After the COVID-19 pandemic there were many ways in which these students were impacted. One of these things was that students no longer remembered how to work together or help each other within the classroom. Sarah Cramer's and my prediction was that this was because they were forced to work independently when they were learning virtually. Many students throughout the year had to learn how to not only ask for help but how to work with others in groups. Helping the students learn how to help each other or ask for help was important in order for *classroom collaboration*.



### ***Collective Understanding:***

While working within Sarah Cramer's classes over these past few years I have witnessed several moments where students engage in "Talking for Understanding." In my personal opinion a major part of getting to productive elements of T4U, collective understanding of students within the class is required. This claim is based on moments where I have seen elements of T4U within Sarah's classes previously. What I mean behind *collective understanding* is that the students within the class understand a certain topic as a whole or within a group. I have noticed this period six class grow within the classroom, by learning how to help peers as well as start to feel comfortable talking out in a small group or whole group settings. In some ways I noticed certain students help one another naturally and even find it important to make sure that their other classmates understood math topics. In this section I describe the learning process the students went through to listen and work with one another. Also, how the students understood the importance of learning from their peers and pushing their *whole* class to understand a certain topic.

### **Learning from Sarah's Struggles**

Throughout Sarah's reflections she seemed to struggle with getting students to work together. On October 14th, 2021 she said, "I think they're honestly used to not listening to each other as much because they didn't have to at all last year. So when we do start to have whole class discussions, I think we'll really have to work on those listening skills/ the idea of being a class, not just one individual student." This comment was really important because it demonstrates how the students within period 6 needed to learn how to act as a class together again instead of focusing on themselves. The next week there was progress because on October 28th Sarah Cramer said, "They did a lot of helping each other in small groups and there was some good language used," meaning they were beginning to work together instead of just for themselves within the classroom. Also by using 'good language' they were demonstrating respect for their peers as well. November 16th, of 2021 Sarah Cramer mentions, "I heard a lot of cool first draft thinking where they are admitting they weren't sure and trying to talk about it anyway." The term "first draft thinking" means that students are thinking out loud, not having fully figured out what they think and not thinking about what their peers' responses will be. Normally within a classroom it takes time for students to talk about their findings on class

problems or activities because they aren't as confident within the subject. This comment demonstrates that students are feeling more comfortable talking about how they figure out a problem even if what they come up with could be considered the "wrong" answer. I cannot be entirely sure on why this class leads to respectful talk and first draft thinking, but it can be because of the class activity during this class or that students feel adjusted to the classroom environment. In the process of T4U the process of thought is important because even if a "wrong" answer is found the way of thinking you or others around you have can help you come to understand what is considered the "right" answer.

After winter break (January 27th 2022) Sarah Cramer had her students work on projects where they had to reteach topics that they learned in class to students in their class to prepare for a test they had to take. She had students work in groups and required that they attempt to make it "not boring." Many students seemed to struggle with doing this even with extra practice time. Sarah Cramer mentioned, "They just don't realize that you need to go slow for someone to understand," and that other ways of explaining are also helpful as well. From that project many students began to realize that teaching is hard and that in order to teach something, thorough understanding is important. I know this to be true because during their lunch period some students stayed back to talk to Sarah Cramer about how their presentations went and many explained that it was hard to have students listen to you, "they just don't listen all the time miss." They also explained why they believed teaching to be hard, "yes it is really hard and you don't know how long to take on examples either."

### **Feedback from Student Survey**

From the survey on 2/17/22, students had to respond to the question: "How confident are you in math from 1-5?" 11 Students responded with 4 or 5 and from my understanding of observing within classrooms, when a student is confident within a topic the more likely they will feel comfortable talking about it and understanding it. There were 5 students within the class that mentioned they were somewhat confident in math (3) and there was 1 student that said they were not confident (1) in math. With the leading number of students within the class being mostly confident with their math skills, I was surprised to see that there were not more conversations with students than what I had seen. Also, these students that are confident in math were not pushing to help the other peers in class who don't feel as confident. Another question they had to

answer was whether someone within the class helped them to understand something in math. There were 6 students who said no and 2 students who said that they received help from Ms. Cramer. However, there were 9 students who received help from other students within the class and there were several saying they received help from Joshua to solve their math problems or teach them about perpendicular angles.

### **Feedback from Student Interviews**

Within the interview with Mara, I asked, “How important is it to you that other people in your class understand the math topics in this class? and why is this?” She said, “I think it’s important for all of us to know and be on the same level because that way we could help each other if Ms. Cramer is not available.” This comment suggests that this student realized that other students within the class can be resources to students especially because Sarah Cramer is not able to help each and every student at once. Mara continued to say, “We could get ideas from each other when we participate or when we do group projects we could learn a new strategy or a new idea on how to approach the problem.” Learning that students in class can also be helpful to your learning and understanding is important because then the student is not restricted to their own or their teacher’s efforts; they have the help of at least 15 thought processes!

Joshua is bilingual and I noticed that he helps translate to peers in class so I asked him about that experience. He said, “Oh yeah I talk to other people in Spanish to kind of explain it if they don’t really understand it in English and to just give them a different perspective of things and it seems to help them a lot,” this comment was so exciting to me because this is another example of collective understanding within the class. Joshua was communicating in another language to further the understandings of other bilingual students within this class. “It just feels good to see other people understand the topic and knowing that I helped them--that’s just a good feeling and a good practice,” Joshua continued to mention that explaining topics in multiple languages also develops his understanding in a better way so that he is able to help his peers and help them to come to understanding these math topics. I also asked whether he learns or understands better through helping other people within class. “Yeah sometimes I make slight mistakes and when I am helping other people they like--point that out and I usually learn from it,” by working with other students, Joshua is able to learn different perspectives and realize different ways of solving a problem.

Within my interview with Wilfredo he mentioned he had the same experience, “There were times where I was--like I would help someone and then ... as I went on with the problem I was able to teach myself things as well.” These three students admitted to me ways that they had learned through working with their peers to help develop understanding. They also all realized the importance of all students within the class to understand these math topics. If these three students were able to understand that they are able to learn more by working together and understanding through collaboration, how can this be emulated towards the other students within the class?

**Commentary:**

Collective understanding to me is something that a teacher hopes to achieve within the classroom even though it can be a challenge. However, based on the feedback from several students I can tell that students understand the importance of having the whole class to understand topics and how helpful it is to learn or work with your peers. Helping one another, reteaching and explaining something to other students are just some examples of how students working together can reach collective understanding. There were examples through these student interviews where groups of students came to understand things together such as Joshua translating math directions to help them understand topics and Wilfredo learning through reteaching while helping another student. If this class was able to model the behavior that was mentioned in these interviews or be more open to helping or reteaching ideas to each other, this class would have demonstrated more examples of Talking for Understanding. However, after my data collection process was over, Sarah told me that there were a few great class discussions in which T4U seemed to be developing more within the class! Although hearing this news was exciting, I wish that I could have been there to witness that for my research. I believe this is because Sarah has continued to push conversations and students generally have been working better within the class and understand it is important to understand math topics in class.

**Conclusion/Significance:**

Throughout my research, the themes of classroom norms, classroom collaboration, and collective understanding emerged as the critical factors in my own learning about Talking for Understanding within a classroom. I learned that classroom norms are critical and yet incredibly

challenging to maintain. Establishing them early (with intention) and continuing to work on developing them is key to creating a classroom environment where students can respect one another and be comfortable enough to be willing and able to say their thoughts out loud and listen to one another's thinking.

Collaborating as a group, that is "thinking collaboratively," is critical if students are to be able to deeply engage with complex mathematical ideas, from many different perspectives, with real understanding. But this doesn't just happen by telling students to talk to each other, or work in small groups. Students in any classroom, at any age, need to learn how to do this, how to help each other and how to work together (which took time and intentional effort on Sarah's part and on the part of the students). It didn't happen easily in this class. It didn't really start to happen consistently until December. But there are great payoffs. This kind of classroom collaboration changes the dynamic between teachers and students, and what it means to learn in school. Teachers aren't required to answer the specific questions of every student, or "tell" the students the mathematics they have to learn. Students become co-teachers.

Collective understanding is when students are able to listen to and learn from each other's different perspectives in order to come to shared understandings as a group. Collective understanding – when it happens – means that students can learn from their own and their peers' own ways of thinking. Instead of the teacher being the primary knower (the key holder of knowledge) and the students being the not-knowers or getters of the right answer, the group becomes "collective learners" and co-teachers. They talk, not just to get the right answers as individuals, but to support the learning – "understanding" – of everyone in the group. I learned much of this from the students themselves. In getting to understand the students' perspectives, through surveys and interviews, I found that the students were learning more from one another than what I was able to witness while observing their classes. Learning how Sarah Cramer develops classroom norms and how she helped students learn how to work together helps me see more clearly what Talking for Understanding entails, how challenging it is, and how it develops over time. It helps me see and appreciate what I will need to be aware of, and be prepared for, and model for my future students – so that they will be able to collaborate and develop collective understandings in my own classroom one day.

This research has been extremely beneficial and important to me. I have been able to learn – by observing Sarah, by participating alongside her, by seeing her students' perspectives

and Sarah's own reflections – what helps students learn, both individually and collectively. This research has helped me notice the real-time processes of how students learn to work together, how they develop those skills over time. It's also helped me see Sarah Cramer's point of view – her struggles, disappointments, and excitement in her reflections, and how she intentionally changes her lessons to cater to her students' needs, so that they are able to learn how to collaborate better and learn more. The talk and interactions that I've been able to observe and participate in give me hope that I can take Talking for Understanding into my own classroom one day. I also hope that other educators can learn from Sarah, her students, and from my story of their story – about both the challenges and the possibilities of Talking for Understanding – and that this will, in turn, enable their students to learn more together.

And to those future and current educators who are interested in using T4U within their classroom, I suggest attempting the three themes I found central to developing Talking for Understanding-- Classroom Norms, Classroom Collaboration and Collective Understanding. I have found through my research that it takes a lot of time, trial and error, and some failures before even seeing a classroom work well or even talk well together. Do not be discouraged if things seem to not be going in a way that was expected. I realized that while teaching and attempting to have T4U in the classroom more unexpected events or conversations happen before the class becomes cohesive or understands each other. Maintaining classroom norms is something that takes time and effort from the teacher as well as the students. It is something that you work on continuously throughout the year so that the students can learn how to act or follow the contract better, and it also helps the teacher to know what they should do to help the students. Modeling group work or even whole class discussions is beneficial to create these productive conversations and with more practice students will be able to have more impactful conversations as they start to trust one another, and their teacher. Although implementing T4U within the classroom is challenging and time consuming, I know and have witnessed how it positively impacts students' learning. While going into my teaching career I fully embrace the challenge that implementing T4U may take for the hope of making a positive learning experience for my future students.

### Works Cited:

- Alexander, R. (2020). *A dialogic teaching companion*. London.
- Best high schools in the U.S. - US news*. (n.d.). Retrieved April 19, 2022, from [https://www.usnews.com/education/best-high-schools/massachusetts/districts/worcester-public-schools/claremont-academy-9571#students\\_teachers\\_section](https://www.usnews.com/education/best-high-schools/massachusetts/districts/worcester-public-schools/claremont-academy-9571#students_teachers_section)
- Brewer, J. D. (2000). *Ethnography*. Open University Press.
- Chapin, S. H., O'Connor, C., & Anderson, N. C. (2009). *Classroom discussions using math talk to help students learn: Grades k-6*. Math Solutions.
- Gallimore, R., Ermeling, B., Saunders, W., & Goldenberg, C. (2009). Moving the learning of teaching closer to practice: Teacher education implications of school-based inquiry teams. *The Elementary School Journal*, 109(5), 537–553. <https://doi.org/10.1086/597001>
- Jensen, B., Valdés, G., & Gallimore, R. (2021). Teachers learning to implement equitable classroom talk. *Educational Researcher*. <https://doi.org/10.3102/0013189x211014859>
- Kim, M.-Y., & Wilkinson, I. A. G. (2019). What is dialogic teaching? constructing, deconstructing, and reconstructing a pedagogy of classroom talk. *Learning, Culture and Social Interaction*, 21, 70–86. <https://doi.org/10.1016/j.lcsi.2019.02.003>
- Massachusetts school and District Profiles*. Contact Information - Claremont Academy (03480350). (n.d.). Retrieved May 8, 2022, from <https://profiles.doe.mass.edu/general/general.aspx?topNavID=1&leftNavId=100&orgcode=03480350&orgtypecode=6>
- Windschitl, M. (2019). Disciplinary literacy versus doing school. *Journal of Adolescent & Adult Literacy*, 63(1), 7–13. <https://doi.org/10.1002/jaal.964>