A TEACHER IDENTITY IN FLUX DURING THE PANDEMIC:
AN AUTOETHNOGRAPHY

By

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ABSTRACT

The Covid-19 Pandemic impacted teachers worldwide in profound ways. Studies have reported findings about how the experience affected teachers in numerous ways including the effects on teacher identity, teacher attrition, teacher burnout, and how teachers successfully managed implementing technology under abrupt conditions during the emergency remote period from March 2020 until June 2020. However, the uncertain working conditions of the pandemic persisted well after the emergency remote period and into the 2020-21 school year and the 2021-22 school year. Students and teachers returned to the classrooms, but under incredibly constraining conditions. Little to no research has been published on how teacher identity was affected by teaching through the prolonged period after the emergency remote period. This dissertation presents an autoethnographic study on the effects of the changing and uncertain working conditions on my teacher identity during this prolonged period of the pandemic. Videos of my classes were watched and memos were written. Thematic (Saldana, 2021) and Bakhtinian (1981) tensional analysis was used to analyze my memos in order to understand my experience as I attempted to teach by staying true to my teacher identity through challenging, constricting working conditions. My findings revealed that successful teaching with respect to my teacher identity is dependent on a system that has interdependent parts. These parts are prerequisite conditions–both originating from my teacher beliefs and the working conditions that I typically teach within. When the prerequisite working conditions of my teaching system were changed due to the dramatic social distancing measures during the pandemic, the aspects of my system that were dependent on me were inaccessible. This inaccessibility caused tensions that I experienced in my teacher identity.

have been here. Specific people who work here, who supported my PhD journey have been some of the administrators at this school. Tim Quinn, Elizabeth Simison, and Jessica Watkin truly understand the life of the boarding school teacher and also the needs of the aspiring scholar. The members of the departments that I work within—the math department, and also more recently, the art department, all supported my dissertation process. They provided support and encouragement throughout the entire journey.

My close family and friends were incredibly supportive. Cathy and Jim Mooney, my mom and dad, who always supported me continuing my education to the highest level, provided childcare and emotional support, in the form of a shoulder to cry and whine on when life got impossibly difficult as personal issues imposed on my emotional state. My sisters–Erin Mooney, Jennifer Mooney, my sister-niece, Molly Mooney, and my sister-cousin-friend, Caitlin Murphy– provided support in the form of a sounding board, comic relief, and middle of the night vent sessions.

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My children, Nola and Jack, trekked this entire expedition with me. My kids were patient and encouraging, despite all of the times this dissertation took me away from them. My son was 4 and my daughter was 8 when I started this program. Now they are 12 and almost 16. My time in this program has occupied more of their lives than not. While I was not constantly working for all 8 years, the program and the dissertation were always present in my mind and it is not lost on me how this might have affected them.

My husband, Brad Toomey, must have an infinite well of patience and compassion, as he was always available to drop his own plans and cook dinners when I had a deadline, make snacks and occupy the kids, listen to me vent, cry, expound on ideas in moments of inspiration, process the details of my research, and just be the best sounding board I could ever ask for. He is a pillar of quiet strength and I thank him because without him, I definitely would not have been able to complete this dissertation.

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION

"I have never doubted myself so much. It's my 3rd year of teaching and I'm starting to wonder if I'm cut out for it. I feel like I'm either failing my students or failing admin and it's just too much pressure. How can I be there for my students if admin encourages no late assignments and zero tolerance? Meanwhile our kids are traumatized by a pandemic, police brutality, and every adult fighting like toddlers. How are standards supposed to be important when there is so much else going on??

 "During one of the more dark and frightening moments a parent might experience, the situation and concerns of the room still drew attentions back to what students and the building needed of me. I felt my lifelong love and professional allegiance in a tense pull on the person in the middle who continued to try to teach."

"Stop trying to give autonomy to teachers when we literally need guidance. It sounds good and well to ask us our ideas. But waiting until after Back to School Night to tell us our ideas are welcome is too freaking late. We are all stressed enough figuring out the day to day."

"Lessons I've Learned in the Last Four Days
1. I am a much better educator when I'm not distracted by anxiety. How can I be fully attuned to my students if my brain is filled with worry?
2. The human element is what makes our job magical. It's still there, fragile and beating below social distance rules and mics and mute buttons.
3. Feeling like the people in charge don't care about our safety or the safety of our students...and community...is disheartening. So are broken assurances.
4. Every other challenging period in my career looks easy in the rear view.
5. Schools can't even begin to fix everything that is wrong in society, but educators keep trying.
6. Being with these empathetic, passionate, real young people is the only thing keeping me going to work. Well, that and a paycheck."

"I am so bad at my job this year. I feel like I fail every day. I should go in tomorrow (Sunday) to try to catch up or even get a little bit ahead, but I don't know if I'll have the drive to even get out of bed."

"I came out of my bedroom the other day after my typical 8 hours of zoom. Ready to wave to my own kids, go to the bathroom, and go right back to planning and grading for another 4 - 5 hours. Typical day. Only this day, my 6 year old son greets me from inside a cardboard box in the living room. He's calling it his Orphan Box bc I'm never around. I have no words for the depth of my exhaustion and feelings of failure."

-Excerpts from *An Anonymous Teacher Speaks* (Martin, 2020)

These quotes came from a padlet called *An Anonymous Teacher Speaks*. In this virtual space, teachers were able to share their feelings about teaching during the early stages of the COVID-19 pandemic. What I have shared is a very small sample of this page. These quotes indicate teachers felt swamped. They felt tired. In the United States at least, teachers were forced to figure out how to teach online on their own (Hodges, et al.,2020; Greenhow et al., 2020; Davis, 2021; Singer et al., 2020), but they did not feel any sense of freedom. They were hamstrung between work and home life (Greenhow et al., 2020). They felt inadequate, or as one teacher wrote, "I feel like I fail every day" (Martin, 2020). They fell short of their own standards, or another teacher wrote, "I have no words for the depth of my exhaustion and feelings of failure" (Martin, 2020). Their sense of self deteriorated, and as one teacher wrote, "I have never doubted myself so much. It's my 3rd year of teaching and I'm starting to wonder if I'm cut out for it" (Martin, 2020). The working conditions that they knew so well were suddenly gone, and the social component to their instruction had drastically changed. As another teacher wrote, "The human element is what makes our job magical. It's still there, fragile and beating below social distancing rules" (Martin, 2020). The conflict between their personal lives, the invasion of their work into their personal lives, along with the new demands of their jobs, led some to a crisis of identity. As one teacher wrote, "I felt my lifelong love of teaching and my professional allegiance in a tense pull on the person in the middle who continued to try to teach" (Martin, 2020).

This crisis speaks to me, too. With 20 years of teaching experience, I am solidly mid-career. Not only that, I have done extensive thinking about my practice through personal reflection, but also in my master's program in mathematics for teaching, and over the last six years in my PhD program in educational psychology and educational technology. Being a

teacher and an education student at the same time has afforded me the opportunity to think deeply about my practice in very intentional and structured ways; I have been able to inform and corroborate my practice with research. With all of this education and reflection, I can confidently say that I constructed a very thorough teaching philosophy and identity as a teacher prior to the pandemic. I was lucky. I entered the pandemic as an experienced teacher who implemented technology in my classroom in creative ways. I entered the pandemic as a PhD candidate in educational psychology and educational technology from a top-tier university. Despite all of this experience, I still struggled just as much and in the same ways as those teachers who authored those quotes.

Each quote speaks to the working conditions that teachers were required to endure during the pandemic, especially in March 2020 through June 2020 when the majority of schools in the U.S. were closed for in-person instruction for some period, forcing displaced students and teachers to engage in remote education. In the United States, 93% of households with school age children reported some form of learning with online resources in spring 2020 (McElrath, 2020). Each teacher's quote from the list above was written in a moment of exasperation and frustration about their personal experience navigating these conditions and the new ways that we were all forced to interact with each other. Each quote speaks, in some way, to the identity of its author. I believe that teachers were motivated to speak up by their seemingly utter loss of self, or uncertainty about their sense of identity, in the face of losing their sense of place and school community.

This dissertation is my attempt to seize an unusual opportunity that the pandemic has provided educational research: to share the nuances of teacher identity, as the formulation and enactment of identity is situated within one's working conditions and social context. Thus, I

embarked on an autoethnographic study - a qualitative research method where I, as the researcher, analyzed my personal experience in order to provide an insider's perspective of a cultural phenomenon (Ellis et al., 2011) - to investigate my own teacher identity. I engaged in self reflective writing from video recordings of my teaching throughout the pandemic. Specifically, I examined videos from my teaching practice from approximately February 2021 until February 2022. This interval includes a cross section of samples of my teaching that range from fully remote (everyone is remote) to hybrid (partially in-person/remote) and between intervals where social distancing was rigorously enacted earlier in the pandemic (from January 2021 through May 2021), to intervals when social distancing standards were lifted (from December 2021 through March 2022). This study defines social distancing as consisting of two dimensions. The first dimension refers to how students and teachers were present in class, either via technology or physical presence: fully remote (everyone is on zoom), in-person (everyone is physically present in the same room), and hybrid (some are physically present and some are remote). The second dimension pertains to the rigor of maintaining strict social distancing within physical presence: maintaining 6 feet of distance from one person to another (i.e.,, completely separated desks) or no distancing (i.e., being able to sit right next to each other), and mask requirements (i.e., masks required or masks optional).

To situate this research, I explain my evolving positionality as a researcher. Next, I review relevant literature on the experience of teaching during the pandemic and on teacher identity, and then I present the framework I utilized to define teacher identity, followed by an overview of autoethnography. I then explain my research methods, including my data collection and analysis procedures. Next, I present my pre-Covid teacher identity narrative, followed by my findings. Next, I synthesize my findings and my pre-Covid identity by situating them in my

working definition of teacher identity. Through this, I explain key differences between the tensions I felt with my teacher identity between the two school years. Lastly, I conclude with the discussion, limitations, implications of this research, and my future research trajectory.

Positionality Statement: Educational Research

Coming into my first courses in my doctoral program, the combined CEP 900/930, which was the proseminar in educational psychology and quantitative research methods, I was one of the few—if perhaps only—people who had some experience conducting educational research. For my master's program, I conducted a quasi-experimental study implementing a conversational/discovery-style Geometry course at my school. I had already been reading Magdalene Lampert (1990) and Suzanne Chapin (2009), two math educational researchers who conducted quasi-experimental research on the teaching of math in collaboration with practicing K-12 teachers. I had read a paper that Lampert (2000) wrote on the need for this kind of research, and she proposed an idea for how teachers could be involved in developing theory and understanding about teaching and learning mathematics. Conversely, about 18 months prior to beginning my doctoral program, I had taken a capstone course at the conclusion of my master's program where a relatively prominent mathematics education researcher, Jon Star, had come to speak to us about educational research. We were asked to read articles in advance of his attendance in our class to prepare for his lesson. In class, we broke up into groups of two and shared our observations on the articles. I distinctly remember talking to my peer about how unrealistic the studies were. The study that he wrote was about interleaved problem sets compared to block problem sets. It was a study that included a pre-test and post-test that were multiple choice, in a sterile, lab-type environment that bolstered the passage of unaffected input/output of "middle school" learning. While I understood the value of such a constrained,

controlled experimental design, the teacher inside of me, who had just completed her first action research project (i.e., my Master's thesis that I previously mentioned implementing conversational pedagogical methods in a Geometry class), questioned the pragmatic validity of the results. How meaningful is this research if it can't be realistically implemented in classrooms across the country? I shared these thoughts out loud with my peer and when I did, Dr. Star looked over at me. He looked suspicious—maybe a little defensive, but did not say anything. It made me wonder how often researchers get actual input from actual teachers about their experimental design. Do they want all that input? What would it do to their research if they were to implement their studies in more realistic environments?

So there I was, about a year and a half later, in CEP 900/930. We had been asked to read articles about constructing data and commentary about the difficulty of educational research. Particularly, we read David Berliner's article "Educational Research: The Hardest Science of All" (Berliner, 2002). He wrote this as a reaction to the No Child Left Behind Act. He talked about the difference between the hard and soft sciences: physics, chemistry, biology, and geology being the "hard" sciences, while the social sciences and education are the "soft" sciences. He posited the claim that actually, we needed to redefine what "hard" and "soft" mean. He claimed that actually, there is "hard-to-do" science and "easy-to-do" science. Easy-to-do science is physics, chemistry, etc. For instance, he discussed the impossibility of achieving replicability between school districts. He stated:

> No program could produce consistency of effects across sites. Each local context was different, requiring differences in programs, personnel, teaching methods, budgets, leadership, and kinds of community support. These huge context effects cause scientists great trouble in trying to understand school life. It is the reason that qualitative inquiry

has become so important in educational research. In this hardest-to-do science, educators often need knowledge of the particular—the local—while in the easier-to-do sciences the aim is for more general knowledge. A science that must always be sure the myriad particulars are well understood is harder to build than a science that can focus on the regularities of nature across contexts. (Berliner, 2002, p. 19)

Okay, then. This guy was making *sense* to me. He was being *real*. This made me think about the possibilities that Lampert was talking about–of including teachers in research. It made me think about a couple of vignettes I read from Chapin, O'Connor, and Anderson (2009) where Suzanne Chapin was sharing her decision-making in her instruction. I was seeing a way to incorporate the local in a meaningful way—to put more power in the results of localized research…perhaps as instances of implementation of instructional approaches that could stand to be interpreted and reinterpreted in relation to others of its kind, in relation to developing theories.

Naturally, in a quantitative research methods class, we talked about types of research: experiments, observational studies, and the derivatives of each type. We talked about quasi-experimental design, and we also talked about the gold standard of research: the randomized controlled trial (RCT). The randomized control trial is a practice in experimental research that allows a researcher to determine cause and effect relationships as clearly as possible. A sample is divided into two or more groups, depending on the number of treatments being examined. These groups receive different treatments–either a placebo or an actual treatment. To control for variability among participants, individuals are selected at random for each of the treatment groups. In sociological/educational research, there are more factors to control than just differences between individuals in natural educational settings (actual classrooms). This often means, then, that a treatment, or a particular implementation of some kind of educational tool or

pedagogy, is implemented in such a way that there are very few variables, in order to determine cause and effect of the treatment versus the control group. In other words, for educational researchers to utilize RCTs, they need to perform these studies in lab-type settings. Thus, the results from RCTs may indicate the possibility that a treatment could work, but these conclusions are limited by the sterility of the unrealistic environment.

It was here, in my quantitative methods course, where I experienced the most dissonance. In our discussion about the reading, I made an unpopular, rather divergent claim—that the randomized control trial is too sterile to be all that valuable, and that the educational research institution, in general, should be a multi-tiered system that incorporates action research. I had it all figured out, and this is what we should do: Teachers should be employed by both their school districts and by research institutions. They should be in research groups with other teacher-researchers, implementing the same experiments in their classrooms, and this data that teachers collect should be fueling larger scale studies that are run by R1 universities. I said all of these things in my quantitative methods class, in spite of having a serious case of imposter syndrome, for other reasons that I won't get into right here. To my dismay, my idea was not as well-received as I had hoped. My teacher sort of dismissed it as unrealistic and that I was somehow missing the value in RCTs. This left me frustrated. Why am I getting the feeling like I'm supposed to be infatuated with RCTs, when Berliner, as previously mentioned, was basically telling us as educational researchers to stop trying to do the "hardest-to-do science" with the "easiest-to-do science" techniques (Berliner, 2002)? Achieving a truly random sample, alone, limits the scope of the kinds of questions that can be asked in the experiment. Achieving "control" limits the nuance within the results and smooths over the nuances of real classrooms. So how could we be asked to read and appreciate Berliner and not bother to try to posit a

8

solution? In my mind, RCTs are part of the problem. They're holding us back. They're keeping educational research from being what it can be.

I still believe this. I believe that teachers and research institutions need a much tighter connection. The seemingly age-old problem of implementing research in practice persists, and the solution lives within the power of this practitioner-researcher relationship that has not been properly strengthened. However, there is more to the teacher experience that cannot simply be accessed from the outside. It requires an insider's perspective to identify the nuances. Not only do we need to embolden the value and meaning of the insider's perspective on a cultural phenomenon, we also need to empower individual experience and the singular voice. Teachers each have their own stories to tell, and those stories exist within a historical context. These stories are a synthesis of what it means to toggle between various categories of being: of what it means to teach in a particular time in history, in a particular place, given a particular population, and in relation to teachers' own intersectional identities.

The messiness of educational research is not going to go away, so it seems to me that we need to not only accept it, but to invite it in, by conducting research that is localized and personal. When we tidy things up in the pursuit of homing in on cause and effect relationships, we gain some knowledge, but we also must state the myriad limitations, and leave behind those that we don't always have the experience or insight to imagine. We don't know what we don't know. While I am not suggesting that we do away with experiments, I do believe that we should take a longer view: give credence to autoethnographic work in order to document historical artifacts and lived experiences. Imagine the wealth of knowledge that we will have when we begin to compare and categorize reflexively written, analyzed experiences.

To this end, autoethnography is not only an appropriate methodology for this proposed research on the nuances of teacher identity, situated within working conditions and social context–it is a necessary one. The pandemic has provided an unusual opportunity to investigate the phenomenon of teaching through autoethnography. The classroom environment that teachers typically navigated, which consisted of social norms inherent in face-to-face instruction and tools that teachers selected for themselves to employ in daily instruction, is much more nuanced and intentionally constructed than a teacher might realize. Its affordances are typically taken for granted, particularly in relation to what teachers were left with to conduct their instruction during both the lockdown and socially distanced in-person instruction. The arrangements of desks (rows facing the front for listening to lecture, pods for small group work, a circle for full class discussion), the facility of writing on a whiteboard, and the choices that teachers make when managing student engagement are the vehicles through which teacher beliefs infuse into classroom culture (Gremmen, et al., 2016). When the pandemic hit, teachers were suddenly stripped of the affordances of the classroom environment that made up so much of their job. Never before has there been such a deconstruction of what a teacher does on a day-to-day basis than during the pandemic. Thus, this pandemic era provides an opportunity for the insider's perspective to be analyzed and heard. Where the phenomenon of the teaching experience–of the moment-to-moment decision making–has often been theorized about and explored from the lens of teaching in practice (e.g. teaching as managing and resolving dilemmas (Ball, 1993; content knowledge and relating to students (Lampert, 2001); schemas to understand teacher decision making (Schoenfeld, 2008), the teacher-researcher now has an opportunity to provide critical insights into the experiences of teaching when the most fundamental, taken-for-granted elements of the working conditions and social context have so vastly changed. What nuances of teacher

identity situated within working conditions and social context might have educational researchers been overlooking in the educational scholarship? What have teachers been overlooking about the necessary conditions of their own practice? If teachers have overlooked critical features of their instructional practice, then how could researchers access them? To answer these questions, autoethnography can help reveal the nuances behind the more tacit sense-making and negotiations that teachers experience during their practice.

In the next section, to contextualize this autoethnography on the nuances of teacher identity within working conditions and social context, I review relevant literature on the experience of teaching during the pandemic and on teacher identity. In addition, I explain the framework I will utilize to define teacher identity. Lastly, I review literature on autoethnography and position my research questions.

CHAPTER 2: LITERATURE REVIEW

Emergency Remote Instruction Versus Online Learning

Teaching during the pandemic forced teachers to transition to an entirely different instructional platform than they were used to. In the lockdown phase of the pandemic (March-June of 2020), teachers in the United States left their classrooms and did not enter them again for several months (Greenhow et al., 2020). Suddenly, they needed to start teaching over video conferencing tools, such as Google Hangout, Zoom, and Microsoft Teams. With little to no training in teaching online, teachers were expected to conduct lessons all day long in order to carry out the curriculum for the remainder of the school year (Greenhow et al., 2020). When the following year commenced, instruction was back in the classroom, but many students chose to continue instruction remotely, causing teachers to continue to integrate their newly adopted remote instructional methods (*Governor Lamont Announces Plans for the 2020-21 School Year amid the Ongoing COVID-19 Pandemic*, n.d.).

A teacher's ability to make the transition to remote instruction with intentional adaptation of online instructional tools varied tremendously across teachers, but even the more technologically savvy teachers still struggled to navigate this new landscape (Archemnbault et al., 2022). Intentional use of technology in the classroom takes thought, time, and planning in order to implement successfully for even just one use (Mishra & Koehler, 2006). The kind of technology implementation that is required in order to create a successful online classroom, where the entire course is facilitated through a variety of technological means, obviously requires much more preparation and skill development (Archembault et al., 2022). Knowledge of the affordances and constraints of certain technology and the ability to use this knowledge to engage

students in specific ways cannot be transmitted to teacher's brains across a weekend or a week's worth of preparation (Archambault et al., 2022).

Some researchers have been concerned about the tendency to equate remote instruction during the pandemic with online learning (Hodges, et al., 2020, Donham, 2020). Emergency remote teaching (ERT) is a term that has been used to define and distinguish remote pandemic era instruction from intentionally designed, well-resourced online learning (Hodges, et al., 2020). Online learning is a well-researched and developed field of education that has been studied for decades (Greenhow et al., In press). The kinds of decisions that are made to facilitate online learning are affected by a wide variety of factors, including size of a class, subject matter, kind of activities and whether they are synchronous or asynchronous, and many others (Means, et al., 2014). Just as the size of a class will affect the kinds of activities that a teacher can use to engage students with the content in a physical classroom, so too can class size affect a myriad of ways of engaging students in an online learning environment (Hodges, et al., 2020; Martin et al., 2018). ERT cannot consider such nuance because it is by definition the implementation of a virtual classroom under emergency circumstances (Hodges et al., 2020). Implementation of technology utilized in ERT is likely to be suboptimal because most K-12 teachers lack the kinds of knowledge and training needed for well-designed online learning (Hodges, et al., 2020). Thus, there is a need to distinguish online learning from ERT, as comparisons made between ERT and online learning may result in evaluating the two learning environments with the same standards, and as already stated, research indicates that they each warrant their own metrics.

Collateral Damage of the Pandemic on Teachers

Whereas studies have indicated the pandemic's impacts on curriculum change, use of technology, the school calendar and even the school day (e.g., Hodges et al., 2020; Yoon, 2020),

the focus of this proposal is on analyzing a cultural phenomenon (i.e., teacher identity within the pandemic context) from my insider's perspective. This section describes the historical setting wherein the proposed research is situated. Empirical studies conducted during the pandemic on teacher burnout (Pressley, 2021; Weißenfels et al., 2022; Pellerone, 2021) and teacher's ability to accept change (Sokal et al., 2020; Weißenfels et al., 2022) indicate how teaching was unsustainable in those pandemic-induced rapidly evolving working conditions. While it is too soon to make assertions about the long term impact of the pandemic on teaching, the impact of the constraints presented from social distancing have shown that teachers' sense of self efficacy declined, burnout increased, and self-perceived personal competence decreased (Pellerone, 2021; Weißenfels et al., 2022). For instance, before the COVID-19 pandemic, Pellerone (2021) conducted a large study in Italy from the fall of 2018 to the fall of 2019, exploring the relationship between teachers' self-perceived instructional competence, self-efficacy, and burnout. When the pandemic hit, the researcher replicated the study between April and December of 2020 (recall that Covid affected Italy months earlier than it did the United States), which provided the researcher with the ability to make comparisons that related directly to the effects of the pandemic. Based on responses to questionnaires, Pellerone (2021) determined that teachers' general level of burnout increased and their sense of personal accomplishment was reduced during the pandemic period, which in turn impacted their perceived competence. Elevated personal accomplishment appeared to be a predictor of emotional, social-relational, and didactic competencies both before and during the pandemic. Pellerone (2021) also found that feelings of frustration and lower accomplishment correlated with manifestations of distress, which were caused by the pandemic.

Other studies (Pressley, 2021; Sokal et al., 2020) indicated that the impact of navigating change on teachers was an indicator for teacher burnout. Pressley (2021) found that stressors, such as Covid-19 anxiety, anxiety about teaching demands, parent communication, and administrative support were key contributors to burnout. Further, the effect of these stressors transcended all stratifying factors–ethnicity, location, years experience, and type of instruction. Specific to the demands of accepting change (Sokal et al., 2020; Weissenfels et al., 2021), the researchers determined that the sudden demand to learn and implement new technologies in order to continue instruction during the pandemic led to stress, which was also affected by teachers' feelings of depersonalization, defined as being detached from the social components of their work lives (e.g. detachment from their colleagues, students, etc.) and lack of accomplishment. In other words, change in social interaction with their colleagues contributed to stress and the lack of social interaction exacerbated the problems surrounding teachers integrating new technology because they did not have each other to help each other in its implementation.

Further, a national study by the Rand Corporation (Steiner & Woo, 2021) explored the job-related stressors and potential reasons teachers leave their profession. They identified a group of teachers who would not have chosen to leave the teaching profession had it not been for the pandemic; they called this group of teachers "pandemic leavers," (p. 2). Steiner & Woo (2021) found that teachers experienced the job-related stressors mentioned previously (e.g., navigation of change, teacher burnout, being required to implement new technologies, deficiency of self-efficacy, etc.), but they also found that teachers reported more frequent job-related stress and depression than professionals in other industries, and that nearly one in four teachers were considering leaving their job by the end of the school year, in comparison to one in six in a

typical pre-pandemic school year. They also found that more Black or African-American teachers were planning to leave.

These studies did not address changes in social factors, such as the kinds of interactions between teacher and student and between teacher and colleagues. While news articles corroborated the findings from empirical studies (Davis et al., 2021; Singer, 2020), they also revealed more overt evidence of the direct impact of the pandemic on teacher identity, particularly in the 2020-21 school year, when many educators hoped that there would be a greater sense of normalcy with a return to in-person instruction. For instance, Davis et al. (2021) found that, in the 2021-22 school year, teachers were drowning. First-hand interview of a teacher coach stated that many teachers in her district claimed that "this is the worst teaching year of their life." The general assumption was that the intensity of the 2020-21 school year was going to be met with more relief, including a relaxing of the U.S. Centers for Disease Control (CDC) guidelines and returning to fully in-person instruction. However, teachers claimed that the causes of prolonged strain on educators were related to the stunted socio-emotional growth and mental health issues among students (Davis et al., 2021). In looking at the 2020-2021 school year, Singer (2020) revealed that teachers were exhausted by navigating the in-person and remote instruction, noting that it was not simply a hybrid instructional model, but rather two separate models that did not always happen simultaneously. Many teachers finished their in-person school day only to have to teach lessons all over again to remote learners (Singer, 2020). In addition, teachers had to navigate their home lives while preparing for these new versions of in-person, remote, and hybrid instruction (Singer, 2020). Davis et al. (2021) quoted school psychologist, Peter Faustino, as he offered an explanation, "I think the effect of the pandemic and all of those issues really now the forefront of our work…where students and families are

saying, 'I can't keep going like this. I need help." Thus, first-hand accounts about the teacher experience–including candid responses about what it meant to interact with students, colleagues, administrators, and descriptions of what it was like to navigate home life and work life–indicated that the drastic changes due to the pandemic had a direct effect on on teachers' working conditions and social context, as well as on their perceived competence and self-efficacy (Davis et al., 2021; Singer, 2020; Martin, 2020).

To summarize, research on teaching during Covid-19 indicates that, while necessary to facilitate learning during the pandemic, the demands on teachers to transition to ERT and then integrate these practices into hybrid instruction had detrimental effects on their wellbeing, causing self-doubt, burnout, and for some, exiting the profession. It is apparent that the strain of teaching without sufficient training or understanding of the tools they were utilizing, along with the lack of connection with other teachers, their students, and the changes in their overall working conditions likely contributed to detrimental effects on teachers and the teaching profession that are not yet quantifiable. Next, I review relevant literature and conceptualizations of teacher identity in which this work is situated.

Teacher Identity

In order to understand teacher identity, it is important to first define what identity is, and an indication of the historic background behind the concept of identity. In brief, the concept of identity has evolved over different philosophical and psychological periods of history (Akkerman et al., 2011). Pre-modernist perspectives conceived of identity in relation to a cosmic whole, that typically was defined as god. For instance, in some theories, all beings were seen as extensions of god or were required to live according to a cosmic whole (Hermans, 2006). From a modernist perspective, identity consists of a singular "I" that evolves over time, but

maintains the same "I" from moment to moment, and across varying ways of being. Further, one's identity is defined from the I, itself, and not by how others define one (Akkerman et al., 2011; Hermans, 2006). The postmodern conception was a reaction to the pre- and modern conceptions of identity. This position claims the opposite is true: that identity is comprised of a multitude of positions of "I"s that develop through one's engagement in a variety of contexts, that these positions can change across time, and that identity is defined in part by the social contexts that one interacts in–that the social contexts are a determining factor of the identities that one has within their multiplicity (Akkerman et al., 2011; McCarroll, 1998). Beyond the postmodern conception, other scholars have argued that "an identity" can be perceived in terms of biographical continuity that an individual can reference and communicate with others (Giddens, 2013), or more existentially, as an embodied practice (Bourdieu, 1990) that is entwined in social, cultural, and political relationships and power negotiations (Elliot, 2019). It is also perceived as a relationship between self and other, individual and culture, and narrative and moment-to-moment experience (Christiensen et al., 2022).

There are a variety of different positions on what teacher identity is and how it is developed. Most of the theories on teacher identity are postmodern in nature, and empirical studies on teacher identity stems largely from preservice teacher programs (Beijaard & Meijer, 2017; Lasky, 2005; Darling-Hammond & Bransford, 2007). Some are narrative-biographical (Keltchermans, 2009), where teacher identity is developed through one's professional self-understanding (one's self-esteem, self-knowledge, self-image, and job motivation) and their subjective educational theory (knowledge and beliefs about teaching). Others propose that teacher identity is shaped by professional, personal and local influences (Day et al., 2007), stemming from how an individual functions as part of a social community (Lave & Wenger,

2001). Some believe that key events affect one's identity, and they result in "leading identities" within a singular identity, coherently assimilated through narrative (Black et al., 2010). Few studies on teacher identity beyond the pre-to-early career stage exist, and they are often within the context of research on professional development efficacy (Heyd-Metzuyanim, 2019).

There is the conception that teacher identity stems from personal beliefs (Kagan, 1992; Merseth et al., 2008; Beijaard & Meijer, 2017), and that teachers' beliefs are the lifeblood of their actions and decisions. In order for this sort of integration of personal belief and professional practice to happen, beliefs need to be assimilated towards a professional identity and in accord with the profession. In other words, the process of becoming a teacher involves relating and translating personal beliefs onto professional beliefs (Alsup, 2006). Further, if personal beliefs run counter to the profession, this conflict can create unsustainable tension; if it does not get resolved, it can lead to teachers leaving the profession (Beijaard & Meijer, 2017; Bronkhorst et al., 2014).

To summarize, the scholarship on teacher identity has generated several key insights that are relevant to my proposed study of teacher identity within the working conditions and social context surrounding Covid-19. Definitions of teacher identity vary, with some emphasizing the integration of sub-identities into one identity, integrating the biographical trajectory of the person in relation to their identity. Others emphasize the situatedness of teacher identity within the social and historical context of teaching. Others prioritize teacher beliefs as the determining factor of one's teacher identity, as belief is fused into teacher practices. Integrating these perspectives, my working definition of teacher identity aligns with both the postmodern and the narrative conception of identity. Identity consists of a multitude of identities that are part of the arc of a person's historical trajectory, while also being situated within the current environment

and social context. These identities index themselves within teacher identity, and facilitate the enactment of a teacher's beliefs into their practice, as beliefs correspond to their identities. This will be described in further detail in the coming sections, as I share literature on how teacher identity is developed and is in continuous negotiation. This definition may change across the course of my study, but I believe that it is appropriate for this autoethnographic study because it allows me to address my experience teaching during the pandemic, when the demands on teaching were exacerbated by an environment that was uncertain and in flux. Next, I review the scholarship on the relationship between teacher agency in relation to vulnerability in order to understand how teacher identity is constructed.

Identity in relation to ulnerability in teaching. Rodrigues, Cyrino, and Oliviera (2022) claim that autonomy is critical to a prospective teacher's professional identity. Autonomy is accessed through enacting *agency*, defined as the ability to adjust to the moment by rethinking their practices and beliefs, in moments of *vulnerability*, defined as one's individuality in relation to unanticipated circumstances or lack of experience (Rodrigues et al., 2022). In vulnerable contexts, teachers are forced to suspend their convictions and certainties. When this happens, the teacher's ability to enact their agency is required. The extent to which they enact their agency is how teacher identity is revealed. For example, on a small scale, if a math teacher is encouraging a class to have a student-led discussion about a problem set, and the students are reluctant to critique their peer's work, it might be difficult for the teacher to refrain from stepping in to tell them how to do the problem. While the teacher might want to promote more student-centric practices, it still might be difficult for the teacher to refrain from stepping in to directly instruct students if teachers have deep-seated beliefs about how mathematics should be taught (i.e., lecture). This is a vulnerable moment for the teacher, and requires them to refrain from stepping

in–which is how they enact their agency in promoting a different class culture. Given that a teacher has an entire class of students to tend to, the teacher's vulnerability is that much more increased because, not only are they trying to resist the urge to resolve the dissonance of the awkward silence by just telling students how to solve the problem correctly, the students staring at them as they wait for the teacher to just tell them the right answer (as most teachers do), but the teacher also has to make sure that all students stay engaged while handling the question. This is the vulnerable moment–the moment where the teacher feels pressure from the expectations that their students have on how they are supposed to do their job and, the expectations that the teacher is trying to redefine for themself on how teaching is supposed to be done. When this moment is handled successfully, the long silence, ultimately will cause a student to finally step in and state something that they notice is wrong about their peer's work. Once that happens, it continues to be up to the teacher to continue to promote student discussion, by waiting for other students to suggest their ideas. As the facilitator of class instruction, it is in the teacher's control to provide opportunities for class discussion. That sense of control comes from making sure that students are engaging in student-led discussion. That control is the enactment of their agency.

While vulnerability occurs within daily classroom instruction, it also exists on a much more fundamental level. It is intrinsically entwined in the nature of the teaching profession, itself. Kelchtermans (2009) identifies aspects of the teaching profession that constitute vulnerability:

1. Working conditions that are imposed on the teacher, over which they have little control

2. Social factors are difficult to control and/or change, and do not only come from students

21

3. Teachers' judgements and decisions are always up for questioning, though the very nature of their job requires that they support their students via their professional expertise.

Thus, teaching is situated in a context that is physical, social, political, and cultural, that the teacher cannot construct on their own, and there are very few variables that are left to the teacher to control (Kelchtermans, 2009). The social component extends outside of the classroom, to the homes of the families of their students and to the perceptions of their peers and administrators (Kelchtermans, 2009). Working conditions, such as classroom space and technology use, are often limited by the political and financial situation of the district. The teacher can control the appearance of a classroom, to a certain extent, but expression of one's personal political beliefs might be limited. For instance, a teacher who identifies as LGBTQ+ might find it difficult, or even impossible, to continue to be a teacher in certain states/regions where the political climate is such that their very identity is in conflict with the dominant cultural norms (Adams et al., 2015). Vulnerability can weaken the teacher, as their ability to respond in vulnerable moments is sometimes very limited, which can contribute to anxiety (Oliviero & Cyrino, 2011).

Keltchermans (2009) emphasizes that,

…teaching and being a teacher is not a neutral endeavour. It implies value-laden choices, moral considerations…the task perception encompasses deeply held beliefs about what constitutes good education, about one's moral duties and responsibilities in order to do justice to students. When these deeply held beliefs are questioned…teachers feel that they themselves as a person are called into question…the emotional impact is very strong because teachers feel that their moral integrity as a person and a professional are called

22

into question. Seeing these deeply held beliefs being called into question may even result

in turnover, burnout, etc. (p. 262)

Therefore, vulnerability is not just experienced by early-career teachers; it is actually an inevitable component of teaching, inseparable from the practice itself. Thus, even in the most stable of conditions, the profession of teaching is an intrinsically precarious enterprise.

To summarize, reviewing the literature on teaching during Covid-19, teacher identity, and teacher identity within working conditions and social contexts that have typified teaching pre-pandemic, has revealed several key themes. First, teacher identity is enacted through autonomy, as an interaction between agency and vulnerability. Having autonomy allows a teacher to be able to enact their agency–to express their own beliefs through their actions (Rodrigues et al., 2022; Beijaard & Meijer, 2017). Second, the working conditions and social contexts of the teaching profession have typically been characterized by factors relating to in-person and traditional instruction, and change within those conditions involved integrating differing teaching practices (Pellerone, 2021). Third, during Covid-19, the working conditions and social factors that teachers have come to accept and work within were completely changed. With the constraints due to social distancing during the Covid-19 pandemic, teachers faced dramatic changes to their working conditions such as, remote instruction, teaching from their homes during lockdown, teaching with masks on, teaching with social distancing, and teaching in hybrid environments (Hodges et al., 2020). At the same time, some of the working conditions that relate to teacher vulnerability continued to persist (judgment and surveillance of teaching by administrators and parents, for instance) (Kelchtermans, 2009). Thus, the pandemic led to a change in working conditions and an increase in factors that contribute to vulnerability. Next, I review two teacher

identity frameworks that might help me understand teacher identity from my insider's

perspective in order to synthesize the initial framework I will use in this autoethnography.

Research on teacher identity from the emergency remote period. Upon returning to

the literature on teaching during the Covid-19 pandemic since beginning this dissertation study, I

found that numerous studies have been published on how the pandemic affected teacher identity.

Methodologies ranged, though they were all qualitative studies. Some qualitative studies took an

ethnographic approach and involved interviews of several teachers in order to determine

similarities and characteristics of the phenomenon among a culture-sharing group (Christiensen

& Nielsen, 2022; Nazari and Sayri, 2023). Some studies were autoethnographic (Godber &

Atkins, 2021; Liu & Yuan, 2021; Loo, 2023; Cambra-Faraci, 2022). Some studies utilized

external artifacts, such as emails and calendars, along with notes that the authors had taken

during the time period they were analyzing (Loo, 2023; Zou, 2024). Three studies, in particular,

aligned particularly well with the research I am presenting in this study. These studies each

investigated the effects of the working conditions of remote teaching on teacher identity, and I

explain each in detail below.

In the first study, Christiensen & Nielsen (2022) interviewed 19 experienced health

sciences professors at two different universities. They qualitatively investigated the embodied

teacher identity and utilized Bourdieu's (1998) "practical sense" to identify the covert knowledge

that teachers use to be able to teach responsively. *Practical sense* is an embodied knowledge that

refers to a teacher's ability to navigate and adjust teaching responsively, on a moment-to-

moment basis. This practical sense includes the *actual senses*, which are used to receive and

provide nonverbal feedback, such as facial expressions, body posturing, etc. They found that

practical sense is used as an extremely effective pedagogical tool, and that remote instruction

limits teachers' ability to read students and adjust their teaching responsively. They revealed that practical sense is a highly motivating tool for teachers, and the constraints of remote instruction, where that practical sense was limited, contributed to teachers' questioning their understanding of their practice and their teacher identities.

Second, in a study by Nazari and Sayri (2023), researchers investigated the online teacher identity, and the transition of a teacher identity from in-person to online teaching. They utilized Zimmerman's (1998) concept of *transportable identities* to understand teachers' perceived change in identity between in-person and online instruction. Transportable identities is the notion that there are characteristics of an identity that can be extended from one context to another. Utilizing the concept of transportable identities allowed the researchers to examine what of teacher identity was transportable from in-person to remote learning contexts. The researchers analyzed the interviews they conducted with six teachers from different disciplines including Persian literature, English, Arabic, chemistry, physics, and biology. They found that teachers preferred the in-person setting, as they were more capable of utilizing and implementing their ideas successfully in lessons. They found that teachers of hard sciences, in particular, struggled to enact their agency in remote instruction. Nazari and Sayri (2023) found that teachers who identified as adaptable and open to learning maintained their adaptability as online teachers and perceived the remote learning phase as an opportunity to learn more about online teaching and gain new skills, which they believe enhanced their teacher identities. One of the teachers, who also had a counselor role, found that the Zoom technology supported their role as a counselor, as it proved to be effective with one-to-one engagement.

Lastly, Loo (2023) conducted an autoethnographic study that explored his performative experience of teaching in online instruction. With the understanding of teacher identity as

dynamic and responsive to context, supported by the ability to enact one's agency and beliefs, Loo identified his teacher identity as being shaped by performative expectations, ranging from formal to informal, and that teachers craft their teacher identity with respect to their expected performance in these various contexts (Canagarajah, 2012; Sahling & De Carvalho, 2021; Varghese et al., 2005). Loo's definition of teacher identity also maintained that because teaching is inherently performative, there is a competitiveness inherent in teacher culture (Canagarajah, 2012) and that the pressure to be a better teacher is in part due to constant comparison to a teacher's peers. Through his autoethnographic study, he found that teaching during the pandemic made the performative nature of teaching more apparent, particularly as students leaned further into complacency and became more withdrawn. As student engagement devolved, pressure on teachers to not just teach, but to perform increased. While admitting to being a teacher-centric teacher, the working conditions of the pandemic caused him to recognize how much he relied on student engagement.

While many studies that arose from the pandemic that investigated teacher identity, these three address how the working conditions affect teacher's ability to teach in a way that is congruent with how they define themselves as teachers. The Zoom technology blocked off their practical sense, which made it impossible to understand their students and caused them to question themselves. The drastically different working conditions pushed teachers to either reckon other identities and adapt or to suffer through with their singular established teacher identities. The diminishing engagement from students, coupled with the Zoom technology caused teachers to feel pressure to be performers and take on the entire load of student learning through an exaggerated form of teacher-centric instruction. In each of these studies, teachers felt

tensions between who they were before the pandemic hit and who they had to be as a result of the working conditions they were left with.

Framework to Understand Teacher Identity: The Bakhtinian Framework

Akkerman & Meijer (2011) adopted a Bahktinian approach to understanding self in order to conceptualize teacher identity. The Bakhtinian framework is dialogical, uniting the modernist and postmodernist conceptions of self. The *modernist* conception claims that self is unitary (there is only one version of the self that persists across one's life), continuous (this self is persistent, not dependent on context, and is recognizable over time), and personal (this self has a voice that is developed from within–not having incorporated the voices of others) (Akkerman et al., 2011; Hermans, 2006). Conversely, the *postmodern* conception of self suggests that the self is a multitude of identities (the self is a set of varying perspectives; the self identifies in many ways), that identity is discontinuous (the self is defined and redefined according to time and context), and that identity is socially defined, (the voice of the self is defined by other voices within their social sphere and culture), (Hermans, 2006). A dialogical conception of self accepts the multitude of identities across many different contexts within a singular self, as those selves are integrated within that unitary self that persists across the span of a lifetime, and is integrated within the narrative constructed with one's personal voice (Akkerman et al., 2011; Hermans, 2006).

As the multitude of selves, contexts, and voices are integrated within this narrative, past events and ways of being are integrated into the present self (Grossen & Salazar Orvig, 2011). Each teacher has their own unique trajectory, dependent on their self-investments, previous experiences, family lives, etc.; a teacher does not simply have a teacher identity that can simply be considered a sub-identity. Therefore, according to Akkerman & Meijer (2011) teacher identity

27

is "an ongoing process of negotiating and interrelating multiple-I positions in such a way that a more or less coherent and consistent sense of self is maintained throughout various participations and self-investments in one's (working) life" (p. 315). These self-investments translate such that everything that a teacher considers to be meaningful and relevant, and all that they try to accomplish in their teaching are things that they also consider to be meaningful and relevant in their personal lives (Akkerman & Meijer, 2011). In other words, what is claimed as important to the person as a professional is what is important to the whole person. What is important to one personally is not distinct from who they are as a professional (Grossen & Salazar Orvig, 2011; Hermans, 2006).

Arvaja & Sarja (2019) utilized the Bakhtinian dialogical framework and socio-culturally-oriented discourse analysis to analyze how preservice teachers positioned themselves while negotiating multiple voices when they spoke about their developing teacher identities. Similarly to Heyd-Metzuyanim (2019), in this study, the participants discussed through interviews the participatory pedagogy that they were learning in their teaching program, which contrasted with each teacher's experiences in their youth, having been taught via more traditional pedagogy. The researchers analyzed teachers' responses with respect to the social component of the dialogic framework–that is, the participants negotiated and integrated differing voices as they constructed their teacher identities. Arvaja & Sarja (2019) ultimately concluded that the process of engaging in narrative (through interviews), in order to integrate and reconcile differences in voices in their development as teachers, allowed them to be agents in their own development of their teacher identities.

While Arvaja & Sarja (2019) do not explore the teacher identity of established teachers, their research shows how the Bahktinian dialogical framework provided an opportunity to

perceive and explore the experience of negotiating several identities within teacher identity. The framework addressed a juxtaposition of identities and how they integrated to form a teacher identity. In contrast, Heyd-Metzuyanim (2019) utilized the commognitive framework to detect a change in teacher identity after engaging in a professional development in explorative teaching practices. The main strengths of the Bakhtinian dialogical framework lie in its fundamental premise: that identity is a negotiation of multiple identities, that this negotiation is fraught with tensions from both within the person and externally from the social context, and that this negotiation is not necessarily a linear progression where a "before" and "after" can be directly traced. Furthermore, the identities that contribute to the professional identity are not disparate from the whole person–who a teacher is outside the classroom contributes to who they are in the classroom.

Though change in identity might end up being a collateral effect of my teacher identity as it passes through the pandemic, my main focus is coming to understand teacher identity, as a multitude of identities and as dependent upon, as well as interconnected with, working conditions and social context. Because I am interested in exploring how I negotiated my several identities within my teacher identity throughout various stages of the pandemic, the Bahktinian dialogical framework is a more suitable framework than the commognitive framework.

To summarize, in the study that I am presently proposing, I adopt the Bahktinian dialogical framework as an initial lens through which to examine my teacher identity within the working conditions and social context of Covid-19. In this framework, since identity is presumed to be a continuously negotiated act of merging disparate identities across time, place, and social context (Bahktin, 1981) – in part, an internalization of the world outside onto the world within (Vygotsky, 1978) – the working conditions and social context are essentially integrated within

29

the identity. Thus, since the working conditions and social context substantially changed during the pandemic, they provide the opportunity to perform an autoethnographic study of teacher identity as it relates to these factors. This is the foundation of the study described in this proposal.

Research Questions

In light of the literature on teaching during the pandemic and the research on teacher identity, I wonder about the reciprocal relationship between teachers and their environments: how they come to construct their identities, how the working conditions facilitate that construction, and how they project themselves onto their classroom spaces. In order to investigate this, I performed an autoethnography where I analyzed my own experience in relation to my positionality. The broad question that guided my research is:

RQ: How did the working conditions surrounding Covid-19 affect how I shaped my teacher identity?

What I have realized about my teacher identity is that my multitude of identities provided me with access to instill different activities in my teaching practice within well-defined working conditions. So how did the change in working conditions affect my ability to access my identities? Next, I provide an overview of autoethnography as a methodological approach to orient the reader before turning to my autoethnographic methods in this study.

What is Autoethnography?

Autoethnography is a qualitative research method where the researcher analyzes their own personal experience in order to provide an insider's perspective of a cultural phenomenon (i.e., teaching during Covid-19) (Ellis, et al., 2011). The *insider's perspective* is the perspective of someone who has experienced the particular phenomenon that they are investigating. Through

30

the use of personal experience, the researcher provides insider accounts of the unobservable parts of experiencing a phenomenon or culture. To this end, autoethnography is valuable because it uncovers the tacit decision-making, sense-making, and first-hand sensory and emotional response that characterizes knowledge and experience of being a member of a particular culture (Adams et al., 2015; Jones et al., 2013). Authoring one's insider analysis as a researcher provides keen insight into the unobservable aspects of experience (Adams, et al., 2015). This perspective contrasts with the *outsider's perspective*, or an analysis of a phenomenon or culture from the viewpoint of a researcher who does not belong to that culture. The outsider position is common in many forms of qualitative and quantitative research, such as ethnography. To this end, ethnography is limited by what is observable from the outside (Goodall, 2001; Adams, et al., 2015).

Autoethnography is in part autobiographical and ethnographic. As autobiography seeks to tell a story artfully and share epiphanies about one's life (Adams, et al., 2015), ethnographies seek to describe a culture with "thick description" in order to provide in-depth understanding of the culture to those on the outside (Goodall, 2001; Ellis et al., 2011). Thick description refers to the extent of the detail that the author provides about the participants and the context of the research setting (Glesne, 2016). Through autoethnographic research, an experience is situated within a particular area of research, or potentially at the intersection of a variety of areas of research, where the analysis of the author's experience stands as an archived occurrence of that particular problem (Denzin, 2013; Hong et al., 2012). As it is both an insider's perspective of a cultural phenomenon and an analysis of that phenomenon, situated within the literature of that phenomenon, autoethnography is a particular type of contribution to the research in that field (Hong et al., 2012; Denzin, 2013; Ellis et al., 2011).

Criteria for quality in autoethnographic research. Whereas most research purports to examine problems from an outsider perspective in order to achieve some sort of objectivity, whether it be to claim a certain truth, expose a problem, or describe a phenomenon of a particular culture or situation, autoethnography reveals and analyzes the experience of actually being in the culture (Adams et al., 2015). To that end, autoethnography is not seeking to attain objectivity in its research. Memory is fallible and one's personal perspective is biased. With autoethnography, the researcher is not trying to sterilize the phenomenon of interest from the byproducts of being human in a human experience (Ellis et al., 2011; Denzin, 2013; Jennings, in press). There is no apologizing for the lack of objective truth–it is the subjectivity of the experience, and the ways in which the researcher addresses their subjectivity in relation to their positionality, which define the value of autoethnographic research.

To that end, autoethnographic research differs from other forms of qualitative research in that there might not be the same means of ensuring credibility (for instance, by employing member checks or means of triangulation). Qualitative research utilizes terms such as credibility of the author and integrity of the methods being applied in the study, which refer to the level of transparency that the researcher provides in their report, the relevance of the problem they are exploring, and the extent to which the research is substantiated by literature (Hong et al., 2012). Most qualitative research is utilized in order to explore the phenomena of cultures of which the researcher typically does not belong. Autoethnography distinguishes itself from other qualitative methods because the researcher is also the primary, and oftentimes the only, participant in the study. Thus, the metrics for assessing autoethnographic research also utilizes credibility, but also verisimilitude and universality. Credibility can be assessed by determining whether an author has taken literary license such that the narrative seems fictional, or whether the author seems to

describe factual evidence in their account of an event (Bochner, 2002). Verisimilitude pertains to validity of the written material. Questions that guide verisimilitude are, "Does it evoke in readers a lifelike experience?" "Is it believable?" and, "Could it be true?" If it achieves validity, then it is able to communicate to readers from many different backgrounds other than the author's, such that they can enter and engage in the experience being described without having to have similar background experiences (Ellis, 2004). Autoethnographic research seeks to achieve universality, which is loosely translated to generalizability–that the experience, itself, transcends the disparate backgrounds of its readers and is relatable, regardless of differing backgrounds, experiences, etc. (Ellis, 2004). In other words, if an autoethnography provokes others to relate their differing experiences to it, then generalizability has been achieved (Ellis, et al., 2011). For many critics of autoethnographic research, these metrics are not enough. They may appear fuzzy, justify naval gazing, and lack sufficient objectivity (Madison, 2006), particularly with respect to empirical research. In the following paragraphs, I will share literature that supports autoethnography in educational research by translating it to the AERA's four focus standards of reporting empirical research.

Hughes, Pennington, and Makris (2012) defend and promote autoethnography as an empirical form of research. They translate the epistemological and methodological history of autoethnography towards the AERA standards by drawing on samples from first-tier, blind peer-reviewed journals with low acceptance rates in order to provide examples of how the methodology satisfies the AERA's principles of reporting research, which is further divided into four focus standards, which are utilized for all types of educational research. These two main principles are: whether the research is warranted and the transparency of the report (Duran et al., 2006). These standards are:

1. formulating social scientific problems;

2. facilitating critical, careful, and thoughtful discussion of methodological choices and claims;

3. offering multiple levels of critique, naming privilege, penalty, units of study, and classifications; and criteria for selected units and classifications; and

4. credible analysis and interpretation of evidence from narratives and connecting them to researcher-self via triangulation, member-checks, and related ethical issues.

While their translation of the AERA framework has not been codified as the official metric to evaluate autoethnographic research, it is effective for discerning how this methodology produces empirical research in its own right. Therefore, I will summarize the salient points in the paragraphs..

With respect to the first focus, *formulating social scientific problems*, Hughs et al. (2012) state that "the application of social science autoethnography begins with the comprehensive formulation of social problems," (p. 212). Autoethnography demonstrates how the research is warranted by first stating the problem, and then situating the self in relation to the problem. Through the autoethnographic approach, the author dives into a thorough explanation of the conceptual, methodological and theoretical orientation in relation to their cultural and historical background. Transparency is addressed when the logic of the inquiry can be completely traced to the initial problem or issue, to the relevant scholarship, to the specific research questions, to the methodology of data collection and analysis, and to the interpretation and presentation of outcomes. Regarding the second focus, autoethnography *facilitates critical, careful, and thoughtful discussion of methodological choices and claims*, Hughes et al. (2012) state the emphasis on transparency in the data collection process–the design of collection, the

defensibility of the data, and the uses of the data. In autoethnography, reflexivity is that much more important–the role of the researcher must be addressed, and how the relationship between the researcher and the site, along with (potential) participants, might affect data collection.

The third focus, *multiple levels of critical analysis, which includes self-critique, naming privilege and penalty, and selecting classification schemes and units of analysis while being critically self-reflexive about the selection criteria* (Hughes et al., p. 213), addresses the generalizability of research. Generalizability is a confusing concept for this methodology, as the concept of self-study seems to be contradictory to generalizability, as defined by positivist forms of research. Generalizability in experimental research is defined as the extent to which the results of a study are relevant to a broader population. The more applicable the results of a study are, the more the study achieves validity, both internal and external (Remler & van Ryzen, 2021). Thus, how can an individual investigation of a cultural phenomenon, via the researcher's own personal experience, be generalizable to a greater population? Generalizability is defined as the researcher's personal critique of the analysis of their experience, or the *reflexivity* of the author, and the reader's ability to relate to that critique. Reflexivity is "the critical reflection of how the researcher, research participants, setting, and research procedures interact with each other," (Glesne, 2016, p. 145). Again, this relies on transparency. The extent to which the author shares their explicit rationales in their decisions to select or leave out data, how it is categorized, their positionality in the data collection and analysis process all contribute to the generalizability of the study. In this way, the author provides themself with defensible justifications for the conclusions that they draw.

The last standard addresses how research *provides opportunities for credible analysis and interpretation of evidence from narratives and connects them to researching the self via*

triangulation, member-checks, and related ethical issues. For autoethnography, this standard addresses the strength of the findings and the ethical standards of empirical research studies. Credibility is achieved by providing alternative interpretations of evidence and explaining the limitations of the evidence, due to insufficient evidence or conflicting claims. Explaining the evidence with respect to historical and cultural contexts, along with why alternative claims are legitimate, provides corroboration of claims that the study is making, as the autoethnographer's voice is presented as a member of the culture it is studying and exists in conjunction to other's claims. In addition, the researcher must also be transparent about how they adhered to ethical standards, and how they resolved ethical issues in their research design, methodology, data analysis, with respect to participants and study location. This is achieved through IRB approval at the onset of the study, and through reflexivity in explaining analytical approaches in the report.

CHAPTER 3: METHOD

Research Context

Before I go into detail about data collection and analysis, it is important to explain more details about the context. More precisely, it is important to explain how social interaction was regulated during the 2020-21 school year, which affected instructional spaces. Rules and guidelines were implemented to minimize community spread of the virus across the United States in order to proceed with in-person instruction. The states were left to implement the CDC guidelines according to viral spread within each state. During the 2020-2021 school year, the CDC guidelines stated that individuals needed to be masked while indoors and to stay 6 feet apart (CDC). This meant that at schools, faculty and students all needed to be masked and capable of spreading out such that there was always a 6 foot distance between any given person. Also, instruction needed to take place in sufficiently ventilated rooms, which also affected the capacity that certain classrooms could take (whether they had windows or not, what kinds of vents they had). Where in certain parts of the country school continued to be fully remote into the 2020-21 school year, many other states were able to provide in-person instruction. My school is in Connecticut, which transitioned to fully in-person instruction in the fall. My state also provided the option for families to continue remote instruction ("Governor Lamont Announces Plans for the 2020-21 School Year amid the Ongoing COVID-19 Pandemic"). While my school is private, this did not exempt us from any of the guidelines that were implemented by our governor. Thus, while my school is both boarding and day, we had students engage in remote and in-person instruction for a variety of reasons, which resulted in hybrid instruction.

The classroom that I taught in up until 2020 had ventilation, but it did not have windows that opened up to the outdoors. There are no desks in the room, but rather, a large wooden table

where students and I sat during class. Because of the 6 foot guidelines, in addition to ventilation issues, I was not able to teach in my classroom for the entire school year. In fact, I taught in different buildings, both on campus and off campus. Because of the constraints on capacity in classrooms, many classes needed to be moved to spaces that the school rented in nearby buildings, such as churches and community centers. The school also constructed classroom spaces in our gymnasium, which I was assigned to teach in for one trimester. Thus, during the 2020-21 school year, I taught in three different buildings and five different classrooms–three of which were in a rented facility across the street.

In the 2021-22 school year, I taught in my classroom once again. Because of the percentages of vaccinated residents in Connecticut, social distancing guidelines were lifted. Because my school required that all students and faculty be fully vaccinated and boosted, when there were small outbreaks of the virus, we were no longer required to implement fully remote intervals. This continued to apply even after the mask mandate was lifted on February 28, 2022. Furthermore, there was no longer the option to provide remote instruction, which meant that there was essentially no longer hybrid instruction. The only exception to this were the intervals when a student was home with Covid and they asked to zoom into class to keep up with the instruction.

The constraints on teaching adjusted with the CDC guidelines, along with my school's response to data obtained from our weekly Covid testing, which therefore affected the classroom dynamic. My school performed weekly Covid tests in order to determine virus spread at school. The default instructional mode in 2020-21 was hybrid, as families were given the option to choose between either remote or in-person instruction, which was socially distanced (6 feet apart). Instruction was facilitated through Zoom and other technology that supported engagement

as equitably as possible across both platforms (in-person and remote). Specifically, teachers utilized technology that allowed them to simultaneously share their screens on a television screen in the physical classroom, while also sharing their computer screens via zoom for the remote learners. For instance, rather than utilizing white boards and markers, teachers used Wacom tablets and iPads, so that class notes could be shared in the same way to all students in all environments. Because of social distancing, my school needed to find more classroom spaces, since most of our classrooms did not have the capacity to hold our typical class size and also maintain social distancing. This impacted me substantially, as I could not teach in my classroom for the entire year.

At certain parts of the school year, instruction was fully remote. This occurred when we returned from vacation weeks. We would start back to school fully remote for at least one week, and would come back to in-person instruction once we received clearance, given our Covid tests. Infrequently, if there was a mild outbreak of Covid cases, we sometimes needed to switch immediately to remote instruction for a one-week period. When we were fully remote, delivery of content was maintained in the same manner, as hybrid instruction required that all content delivery be mediated via zoom and iPad.

In the 2021-22 school year, there was no longer hybrid instruction, except occasionally, when a student or teacher was home sick (not necessarily with Covid). In this case, a student would zoom into class on a teacher's laptop and engage in instruction. I no longer used my iPad to share class notes when we were fully in person with no social distancing, as my classes returned to my usual classroom and I was able to facilitate students sharing their work on the board. When a student was home and zooming into class, I did not revert back to iPad use.

Instead, I carried my laptop around to show the remote learner the board and their peer's presentation of their work.

The focus of this research, then, is to examine teacher identity as a perpetual negotiation of a multitude of disparate identities with respect to time, place, and social context. The pandemic caused a tremendous upheaval in how and where instruction occurred, and this provides an opportunity to perceive and explore the experience of this negotiation of identities. I will perform this research through analyzing my personal experience as I navigated teaching during the pandemic. Utilizing an interpretive autoethnographic approach, I wrote memos from viewing my video recordings from my instruction from February 2021 until February 2022. By "interpretive autoethnography," I mean an autoethnographic study where I am analyzing my experience in order to achieve a theoretical understanding of the phenomenon that I experienced. This phenomenon, namely teaching during the Covid-19 pandemic, was not unique to my life. The purpose of performing an autoethnographic study is to shed light on the experience of teaching from the insider's perspective, in order to reveal nuances that might not be accessible from the perspective of the more typical, outsider-researcher. Where some autoethnography is written in an evocative manner in order to evoke an experience in the reader, this dissertation is utilizing analytical techniques in order to interpret my experience of navigating my teacher identity as a way in to gaining a more theoretical understanding of teacher identity. I provide this analysis in Chapter 5 through coding the memos that I wrote utilizing Bakhtinian coding and a coding scheme that I constructed from a framework for teaching in the Harkness method, in order to critically analyze the experience of negotiating my teacher identity when working conditions and social context changes.

Data Collection

My data collection was a multi-phased process. These phases were:

1. Construction of narrative

    a. Pre-Covid Teacher Identity Narrative: I reviewed several documents that I wrote from when I changed my teaching practice in order to help me recall details. This narrative is described in Chapter 4.

    b. 2020-2021 Covid Teaching Narrative: With the use of zoom recordings, I wrote memos about the experience of teaching during the 2020-2021 school year of the pandemic. I watched the videos in order to help me recall what I was thinking and feeling while I was teaching at those points in time. I included excerpts from my memos in the Findings Chapter order to share my experience in deeper detail.

    c. 2021-2022 Covid Teaching Narrative: With the use of zoom recordings, I wrote memos about the experience of teaching during the 2020-2021 school year of the pandemic. I watched the videos in order to help me recall what I was thinking and feeling while I was teaching at those points in time. I included excerpts from my memos in the Findings Chapter order to share my experience in deeper detail.

First, in the pre-Covid teacher identity narrative, I provide the groundwork of my teacher identity by utilizing artifacts from my writing on my teacher identity in order to construct a framework identity with which to draw comparisons across the pandemic. These artifacts are:

1. Excerpts from writing that I did in 2015 about how I utilized metaphor in order to help me navigate changing my teaching practice according to my pedagogical beliefs. These metaphors represented different identities within my identity.

2. Excerpts from my master's thesis where I implemented conversational techniques in my geometry classes. This is an important document because here, I am writing about enacting new pedagogies that correspond more directly to who I wanted to be as a teacher. While this was written before I wrote about my teacher identity in a more established way, I maintain that this is important to draw from to show how I negotiated tensions between traditional and explorative teaching.

3. Additionally, to provide additional description of my pre-pandemic teacher identity and working conditions, I describe my classroom space.

I read these artifacts in order to recall nuances from how I constructed the teacher identity that I had before the pandemic. In Chapter 4, I provide this detail and I explain how I used my identities in order to train myself to teach in a student-centered way.

Next, I searched for zoom recordings from two sections of my classes: winter term Geometry 2020-21 (December 2020-February 2021) and winter term Accelerated Geometry 2021-22 (December 2021-March 2022). From these classes, I chose two lessons: one remote and one in-person/hybrid. I selected zoom recordings from a collection of 116 lessons, totalling approximately 155 hours. My library of zoom recordings from the winter of 2020-2021 was much larger (90 lessons, 120 hours) than that of the 2021-2022 school year (26 lessons, 35

hours). Hybrid instruction was a daily occurrence in 2020-21, as I had students who chose to attend school remotely, and my zoom settings were set to automatically record. To that end, Zoom classes were on average approximately one hour and 25 minutes long. Zoom class recordings were much fewer in 2021-22 because hybrid instruction was not a daily practice in the latter school year. Lessons were only provided on zoom and recorded when a student was home because they contracted Covid, and so students zoomed into class in order to stay on pace with the course. The only other circumstance when Zoom class was conducted and recorded was when my school deemed it necessary to have remote instruction to mitigate the spread of illness. All of this said, the average Zoom class was approximately 1:15 minutes.

My criteria for selecting videos for this study came down to finding corresponding dates between the two years that had common characteristics. I chose the lesson from February 16, 2021 (56:06 minutes) because it was the earliest recording that I had (we were required to delete recordings throughout the year to save room in our Zoom account). This was approximately halfway into the term. I chose the February 23, 2021 (1:27:12 hours long) date because it was one week into the hybrid period, but 6 weeks into the term. As I already mentioned, there were very few remote days in 2021-22 school year, so I selected December 14, 2021 (34:32 minutes long) because it represented a lesson where I had made intentional choices to teach certain content with the remote technology. That date was only two weeks into the term, so it was essentially one fifth into the term. Because I had much more limited selection of in-person recordings of class from this period, I chose the January 20, 2022 (1:27:29 hours long) date because it was 5 weeks into the term, which was approximately equal to the in-person class from 2020-21. The two hybrid classes appear to be the longest, as I did not pause the recording when the class went on break. The February 16, 2021 date appears shorter because students were also

in breakout rooms for approximately 25 minutes during that class. The December 14, 2021 class was shorter due to extenuating circumstances unrelated to school.

With the videos that I selected, I wrote memos in response to the memories that surfaced while watching myself teach. These memos focused on my experience navigating the tensions I experienced between my teacher identity and the changing teaching environment, or working conditions and social factors, as a result of social distancing during the pandemic. I watched each video in order to recall how I felt while teaching each class. While this was inevitably observational, in the sense that I could not actually transport myself back to the moments where I was in each class, the recordings not only helped me remember, it felt like they caused me to re-experience teaching these classes quite vividly. With the help of the videos, I was able to resituate myself in each learning environment and relive the experience of navigating my students' behavior, my expectations on myself, and the technology I was using. Like an actor who is playing a role in a play that runs multiple times, I was able to put myself back into my Covid teacher role each time I watched the videos, and incite the feelings I experienced throughout each lesson.

I did not record every single feeling that I experienced throughout each lesson. There is no way that I could have remembered every single feeling of discomfort or joy that I experienced. Without watching the videos, I do have a general recollection of what made me frustrated/happy, and what caused me to experience relief/joy/despair. As the videos brought me right back to the experience of teaching, I was able to identify those general memories with particular instances. I wrote a range of memos, from very brief to much longer, and those that were the most substantive corresponded to moments in the video that triggered me to relive the experiences that corresponded to those general memories of the experience. For instance, my

recollection of teaching during the remote classes of the 2020-21 school year was frustration

about my students' lack of engagement in daily lessons. In spite of most of the class having

become withdrawn and disengaged, I was able to rely on a few students who were still actively

engaged and willing to share their solutions to homework problems. As an example, a particular

memo where I relived this frustration was when I chose to keep the same student presenting on

two problems in a row, just to maintain some semblance of student engagement in the class:

> I totally could have had a different student do this problem, even though it was related to the one we just did. but I really was just focused on getting the problems done and making sure that it ran smoothly. i didn't trust that if i switched to another student that we wouldn't have to somehow start back at square one. Why? Because I did not trust that students were paying attention. I knew that this class was being recorded and that students could look at it again. I knew that I needed to get through material. I knew that we all were not having fun. We were 15 minutes into the class and only one student had made any real contributions. This would have normally been a conversation. I would have looked around, had her pause, and ask if students had questions or comments. I knew I could rely on this student because she was an active participant on her own--I never worried if she was paying attention. so at least if she was the one presenting, then the work would be at least close to correct. It was like fake Harkness. fake class discussion. fake student-centered. I was getting on to get on, and I knew that most of the students in the class would appreciate that, anyway. I think I knew that teaching in a discussion-oriented way was not going to work with certain classes (this one in particular), but I didn't want this whole experience--the covid social distancing experience--to change who I was as a teacher. I wanted to at least pretend that I was doing it and then pick back up with my teaching practice when things become normal again. I wanted to at least try to, or pretend to, require student-centered discussion throughout covid. it totally did not work in this class. I feel like I was sort of a ventriloquist. That's extreme. but not totally. I mean, this student was definitely doing her own work and participating. but she was the strongest student in the class. I was using her to represent to the class a student who was not perfect, but was pretty good at reasoning through a problem on her own. I was using her to show the class that it is okay to make mistakes and to fix them. but--she was easy to work with, and it was still just a dialogue between me and her. So in that regard, I was like a ventriloquist.

This nuanced detail of having the same student present two problems in a row was not something

that I recalled without the videos, nor were the particular feelings of self reproach that I

experienced on a tertiary level while the student was presenting on the second problem, though

the general feeling that I had of doing "fake Harkness" was an enduring memory.

Data Analysis Methods

Two coding methods were utilized in order to ascertain tensions within my identity throughout the study: thematic analysis (Saldana, 2021) and Bakhtinian analysis (Bakhtin, 1981), or tensional coding. These coding schemes will be performed in a two-part process. First, thematic coding will be utilized in order to code specific phrases that indicate shifts in emotional state and in managing my teaching with respect to the working conditions. Then, tensional coding will be applied in order to determine tensions during negotiations of my identity.

Thematic analysis. I watched my lesson videos and read their transcript and wrote memos as I watched. After I completed this step, I noticed that I had written about my emotional state, my observations of how students were behaving, my observations of how I was behaving, about interacting with the technology, and my emotional state about how I sounded while I was teaching and interacting with the technology. These memos were memories of the thoughts and feelings that went through my mind during class. Thus, I determined a coding scheme based on these observations that is displayed in Table 2.

Bakhtinian analysis. Hong et al. (2016) adapted the Bakhtinian framework as the foundation of a tensional approach to qualitative data analysis. Tension is a critical component of the Bakhtinian framework because, as stated in the literature review, identity is conceived of as a multitude of identities that are at times harmonious and at other times in conflict with each other. The dialogic conception of identity is a dialectic between the juxtaposition of a multitude of identities that are socially constructed and discontinuously felt (antithesis), and the unity of identity that is personally constructed and continuously and persistently coherent (thesis). The synthesis between these two seemingly opposed identity structures is the negotiation between the multitude in order to continually redefine the identity as a whole. Commensurate with this

conception of identity, language, itself, also swings between tensions that unify disparate voices and tensions that individualize and disunite voices. While Hong et al. (2016) utilized it within a study that included multiple researchers and participants, and the tensions that they analyzed were among a literal multitude of voices, I used it as a tool to analyze the tensions between my identities, as these tensions were observable both within each context and across the contexts throughout this study.

Bakhtinian coding occurred as a second tier of coding, after completing thematic coding. Hong et al. (2016) claim that their coding did not occur at the utterance or line-by-line level. They utilized three guiding questions (What stood out? What connections did you make? What issues did you identify?) that they addressed when they read each participant's narrative in their study, as these pertained to their research questions. Then, they looked across each of the narratives and searched for common tensions. In my study, having already coded my memos for emotions, indications of beliefs, working conditions, and sensory experience, what stood out were clusters of codes that indicate interdependencies between affect, aspects of the teaching, and the working conditions, which resulted in indications of tensions with respect to identity. As Bakhtin (1982) has claimed, identity is a negotiation of multiple identities that are affected by social and contextual factors. As the pandemic continued, my identities were shifting, and other identities that I had formerly adopted (or utilized in my teacher identity) were negotiating their way back into my teacher identity, as I responded to the shifting working conditions, which were made up of those social and contextual factors.

This will be discussed more in the findings, but the themes that emerged from the coding process revealed a more overt relationship to the Harkness teaching practice. This will be explained more in Chapter 5.

Table 1: Data/Use/Types of Analysis

How did the working conditions surrounding Covid-19 affect the way I negotiated my identities, as I shaped my teacher identity?				
Raw data	**What is it for?**	**Objective of analysis**	**First level of analysis**	**Second level of analysis: tensions between identities**
Excerpts from writing from 2015-16 about my teacher identity	To construct the teacher identity that I maintained, and tried to maintain, in the time period up until the pandemic	Narrative and thick description describing my teacher identity in order to define identities with which to code my data from the pandemic		Identity
Videos from 2020-21 school year	Affective dimension: response to students, response to technology, outward appearance of of my disposition Recollection of the experience, with respect to how I recalled negotiating my identities–what are the things I remember about how I felt	Narrative attending to inflection/tone (laughter, frustration, cold/warm): When talking: ● To students ● About mathematics ● While writing on ipad	affective/conceptual coding	Bahktin analysis (Hong et al., 2016)

Table 1 (cont'd)

Videos from 2021-22 school year	Affective dimension: response to students, response to technology, outward appearance of of my disposition Recollection of the experience, with respect to how I recalled negotiating my identities–what are the things I remember about how I felt	Analyzing inflection/tone (laughter, frustration, cold/warm): When talking: ● To students ● About mathematics ● While writing at the board

Table 2: Codebook

Sensory				
Code	Subcodes	Definitions of codes	Examples	Symbols
Awareness	Seeing/hearing	Indicators in video about what I can/cannot see/hear (physical senses)	"The energy is dead in here"	Aw.S/H
	Awareness of students/class	Indicators in memo about my awareness of the class, students, etc. (community)	"I felt like I was ignoring my remote students…they were stuck in my computer."	Aw.Comm
Emotional	Affect positive	Indicators in video of positive affect	"Okay that's awesome."	EA+
	Affect negative	Indicators in video of negative affect	"It's like a little version of hell."	EA-
	Memos (reflection) positive	Indicators in memo of feeling positive	"I seem very pleasant. happy and kind and optimistic."	ER+
	Memos (reflection) negative	Indicators in memo of feeling negative	"The pencil tip is slippery and the mark is ugly."	ER-

Table 2 (cont'd)

Conceptual				
Code	Subcode	Definitions of codes	Examples	Symbols
Teacher Beliefs (implications of teacher identity)	Community of Practice	The belief that teaching is creating a community of practice–creating a culture of "we are all mathematicians together doing math." Learning through doing and socialization. Student-led discussion.	Lessons from 2/16/21, 2/23/21 and 1/20/22	CoP
	Deliverer of Content	The belief that teaching is telling and students acquire skills and facts through direct instruction. Learning through being told facts and practicing skills independently.	Lessons from 12/14/21	DoC
Trust/Belief (implications of working conditions and teacher belief)	Trust/accountability	Indicators in memos dealing with issues of trust and accountability	Incident where a student was unprepared and giving reasons and I was remembering that she seemed dishonest.	Tr
Working condition: Technology	Technology	In-video instances when the technology is the direct object of the utterance	• Airplay issues • Writing on iPad • Checking to see if I'm muted	WC.T
	Unintentional Use	Unintentional affordance or use of technology realized	Affordances of notability that I am commenting on	T.U
	Intentional Use	Curriculum decision, given technology	Teaching trig formulas on remote day	T.I

Table 2 (cont'd)

Working condition: Type of presence	In Person/Hybrid	Class is in-person/hybrid	Indicated in the date of lesson	WC.P.H/In
	Remote	Class is fully remote	Indicated in the date of lesson	WC.P.R
Identities	Artist	In memo, referencing Artist self	"My writing is so ugly"	I.A
	Theatrical/entertainer	In memo, referencing Actress self		I.T
	Philosophical	In memo, referencing philosophical self		I.P

CHAPTER 4: MY PRE-COVID TEACHER IDENTITY

In order to understand the changes in my teacher identity across the pandemic, it is necessary to understand my teacher identity before the pandemic and how the working conditions not just affected, but facilitated my teacher identity.

How I Wound Up Teaching Math

I have a lot of interests. There's no denying it. I'm like a packrat with my interests, and I have a hard time letting some things go. It might have to do with the fact that my parents are opposites. My dad is a retired physics teacher with a PhD in elementary particle physics and reads theoretical physics and does differential geometry in his free time, along with playing classical and jazz guitar. My mom is a retired nurse, who really should have been an artist and probably a theologian, if she had more confidence as a student. While we as humans often emulate our parents when we grow up, where would that put me? Without sharing all of the details of my academic ups and downs, my dysfunctional family dynamics, and my birth order, I ultimately chose to study philosophy and dabbled in mathematics in my undergraduate education. After earning my bachelor's in philosophy, I worked for one year for my cousin at his energy research firm doing data entry, editing of reports, and answering phone calls. The following year, I took a position teaching math at a small Catholic high school in East Boston, between 2001-2003. At the time, I was 23-25 years old, and I taught math because I enjoyed the school environment. I preferred it to doing the entry level office work I was doing. Though I did not have a degree in mathematics, there was a shortage of math teachers and certification was not required at parochial schools. However, I realized that I did not like the responsibility that was involved with being these students' math teacher. I did not really take myself seriously as a math teacher–I did not see it as my calling. Looking back on my own life and thinking about my

various teachers, I saw them in an archetypal way, such as "My US History Teacher," and "My Algebra 1 Teacher," etc. Given my current inconsistent interest and effort in my teaching practice, I knew that there would be a future where any one of my students would look back on their education and think about "My Calculus Teacher" and that was a role that I did not want to forever play in their own personal histories. I felt that my investment in my teaching craft was shoddy (because it was at that time), and it felt wrong to continue playing the Math Teacher role in my students' lives. Fundamentally, I simply did not identify with who I imagined that person to be.

After those two years of teaching math, I left the profession in order to pursue art, which was my first passion. I earned my MFA in painting, and I immediately was offered a position teaching art full time at a small boys' school. Though I was hired to teach all of the art classes this school offered, I was asked to teach one section of Calculus, which I was happy to do. While I enjoyed teaching art, the school had some problems which were difficult to endure, and my then-husband at the time did not like living there, so when I became pregnant with my first child, it felt like an appropriate time to move on. There were no art teaching positions available anywhere, so I opened up my search to include math teaching positions. Very quickly, I had an interview and an offer at the school where I currently teach today, a private college preparatory boarding school in the Northeastern United States.

Thus, returning to teaching math was somewhat out of desperation. Because I had never fully shrugged off math, it was not so hard to imagine myself returning to it for a while. I never saw it as my calling, but it was also easy for me to return to, albeit in a rather uninspiring way. When first arriving at my current school, I taught math in a very traditional, stand-and-deliver manner, as the rest of my colleagues in my department did at the time. Certainly, the department

was very traditional, and students were very comfortable with lectures and note taking. For me, it was not necessarily an intentional decision to teach in this way–one might say that I was in the "fake it til you make it" phase of my career, and I essentially taught in the same manner that I had been taught. This did not make me any different from many other math teachers, as teachers typically teach how they have been taught (Ball, 1990). At this point in my life, teaching math was a way to put food on the table and a roof over our heads, as my husband played the role of stay-at-home-dad at the time. He was always between jobs and, between the two of us, I was the one with the degrees and straight-forward career path. Thus, while navigating being a first-time mother and a brand new job, I actually relied on teaching to be a *transactional* experience that I did not have to pour my heart and soul into; I could tell students about different concepts and explain those concepts to them; I could demonstrate using those concepts in example problems and students would take notes, then practice applying the concepts by performing the procedures I showed them in class. Geometry was a little different, as problems were not as replicable as they are in Precalculus or Calculus, and writing proofs does not seem to have a set procedure, unlike, for example, performing polynomial long division. This actually was something that my students often complained about with my assessments–that the problems always seemed to be different from what they had practiced in class and in homework, despite the assessment problems always coming from the same textbook materials. Over time, this sort of complaint started to feel more and more like a red flag.

After my first year at my new school, I was asked to teach Statistics, which was a course that I had never even taken before in my entire life. So there I was, teaching math at a school without an undergraduate degree in education or mathematics, and I was about to teach a subject that I was planning on teaching to myself just by reading a Statistics textbook. I was able to find

a statistics class at the Harvard Extension School (HES) that would help me prepare for the course. Of course, this extension school Statistics class did not start until the second semester of the year I was to teach Statistics, but at least the extension class covered the more complicated topics before I had to teach them by the end of the school year. HES also offered a master's degree in Mathematics for Teaching, which covered the pedagogical content knowledge for teaching math. I realized that teaching mathematics could always put food on the table for my family no matter where I was, so I decided to enroll in the master's degree program to make me more hirable, in case I needed to change jobs again. The courses were actually quite interesting, and I was sort of invited back into problem solving in a way that I had not been when just teaching it and participating as a member of my math department. I did not have my own mathematical problem solving practice. I think that, alone, should say a lot about the state of math education, let alone about my identity as a math teacher–that I could be a math teacher by knowing the curriculum and doing the problems in the textbooks, but not actually doing math outside of class just for the sake of engaging in problem solving. Honestly, though, I had not been identifying as a math teacher. I was an artist, mother, and wife who was teaching math.

The courses I took as part of my master's in Mathematics for Teaching started to incorporate themselves little by little into my teaching practices, though I still largely taught in the same traditional manner as I did when I started. After about five years, I noticed that while students continued to succeed in memorizing procedures and applying them correctly to earn their high grades, they also continued to struggle to communicate about the math they were learning. Some students would be reluctant to say very simple math words like "rectangle" and "slope," even though they might have just earned a perfect score on those concepts. Students' consistent struggles and reluctance to speak with confidence about basic math terms, year after

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year, started to feel more and more problematic. I became concerned with the fact that my students struggled to explain their work on assessments, or that they appeared to lack the confidence to use basic geometric vocabulary when responding to a simple question in class.

Meanwhile, in a parallel universe in my home life, my marriage was unraveling, and I was beginning to emerge from being overwhelmed by the big, narcissistic personality of my soon-to-be ex-husband. I had always had a very hard time articulating myself when in arguments with him, and I was always at a loss for words when he demanded that I prove the validity of anything that I might complain about. What I was experiencing at home struck me as very similar to what I was experiencing in my classroom with my students. While there were very different reasons why my students and I were at a loss for words, as their math teacher, it occurred to me that while I was giving them the theorems and algorithms to find answers to math exercises, apart from asking them to explain their work, there were no other opportunities to formulate their ideas verbally. Furthermore, it occurred to me from my personal experience at home that actually speaking my thoughts out loud had a very liberating effect on me, and it somehow brought me to a deeper level of understanding. The very act of articulating my thoughts out loud transformed my understanding of the ideas, themselves.

Entering my classroom in the midst of an evolving epiphany, I saw my students as a mirror of myself. Their insecurity in saying basic words that happened to be mathematical was something for which I suddenly felt much more empathy. It was then that I realized that I was not giving them the opportunity to actually make the mathematical knowledge their own. They struggled to speak about mathematics because they never had to solve any real problems. It occurred to me that speaking earnestly about math does not come from doing a zillion 'drill and kill' problems, that is, providing students with an exorbitant number of repetitions on a particular

skill or task until their intellectual curiosity is ultimately crushed; they needed problems that

challenged them, that were contextualized and required interpretation. They needed problems

that required that they draw diagrams in order to visualize the situation. Without having real

problems to solve, they would never develop any reason to apply any concepts or even have a

chance to be inventive or creative with math. Teachers often complain that their students cannot

write explanations about their problem solving process, but if students are only ever asked to

replicate a procedure in blocks of similar problems, then they have not been given the

opportunity to learn the deeper reasons why certain procedures work.

Once I started thinking in this way, the foundation of my transactional teaching started to

crumble from underneath me. I needed to pour more of myself into this accidental career. I

realized that teaching through lecture operates on an incorrect assumption: that because the

concepts in mathematics have already been discovered–the rules and theorems have already been

proven–that teachers should impart this information to students and students should practice

mathematical skills. This assumption, though, ignores a critical piece of the evolution of

mathematics: the idea that mathematics is first discovered or constructed because someone

wondered about an idea or a problem, and then decided to work on it until it was solved. Inviting

students to wonder about a problem that is mathematical and investigate it until a solution has

been found not only allows students to know the reasons why and how of concepts and theorems,

they are then changed by the experience of having made that discovery. In other words, they

would start to develop a *mathematical identity*.

I was coming to terms with the fact that enjoying math and telling students about math

did not mean that I was actually inviting my students to be mathematicians and that got me to

thinking about potentially a different way of understanding the classroom. The organization of

teacher, student, and content needed to change. The content should not just be distributed to the students by me;I should give them opportunities to discover the mathematics that they were learning. Having remembered a professional development opportunity I once had at my previous school about *Harkness instruction*, a type of instruction I describe in the next section which offers an alternative to teacher-led lectures and rote memorization, and knowing that my school used the method in English and History classes, I decided to adopt this method in order to try to solve the problems that I was experiencing in my lecture-centric classroom. The method provided me with a structure that would do the reorganization that I needed, and I would not have to come up with something completely new.

What I Changed

In 2013, I used my master's thesis as an opportunity to implement the Harkness instructional method in my Geometry classes. This method originated in 1930 at Phillips Exeter Academy, in Exeter, New Hampshire. At Exeter, teachers take on a facilitator and moderator role and student-led discussion is center stage. The job of the teacher is to compose assignments that are both manageable and challenging, facilitate class discussion that is equitable, and step in when necessary in order to maintain accuracy and progress in the learning. Harkness instructors do not stand up and lecture to their classes, nor do they allow one or two students to dominate the class and allow others to complacently sit back. Harkness teachers focus on student learning through dialogue–the ones who do the talking are the ones who are doing the learning. Making sure that the concepts and the problems are being discussed correctly requires the Harkness teacher to have a keen ear. Teachers have to alert students to errors, while resisting the urge to make the corrections for them. The main goal of the Harkness math teacher is to maintain students' own faith that they can solve the problem by keeping the opportunity open for them to

solve it. The natural inclinations of the teacher (e.g.,to show and to tell, to create closure when confusion abounds)must be broken down so that a new version of the learning can be accepted. This new version of the learning not only has students allowing themselves to believe each other when the teacher does not step in, it requires students to use and strengthen their own knowledge and problem solving skills to verify the work of their peers, rather than relying on the teacher's approval. To that end, Harkness teachers work to dismantle students' preconceived notions about the role of the teacher, what learning is, and what students' role in the learning is.

Harkness instruction facilitates intellectual risk-taking in learning. While there are several essays on the benefits of Harkness instruction from the point of view of teachers and administrators, there is minimal scholarly research that explores the effects of Harkness instruction. The one article that I found was published by Madora Souter and Shelby Clarke (2023). They conducted qualitative research on the teachers' and students' perceptions of Harkness instruction in order to construct a framework for building a culture of intellectual risk-taking in the classroom. After visiting Exeter nine times, where they observed classes and interviewed students and teachers, Souter and Clarke (2023) determined eight key criteria for successfully building intellectual risk-taking. These criteria are (1) reimagining purpose of school as egalitarian and process-based, (2) creating a safe classroom community, (3) promoting the idea that there is no single correct answer, (4) normalizing disagreement and problem solving, (5) teaching discussion moves and expectations explicitly, (6) training students to support each other, (7) maintaining the expectation that students supply evidence for their claims, and (8) engaging in critical reflection. It is not necessary to explain in deep detail each of the criteria, though there are other overarching characteristics that resonated with me when I read the example quotes in their article, which align with my description of Harkness instruction in

this chapter. Specifically, the concepts of trust/belief, process over agenda, the learning process over getting right answers, egalitarian community over teacher and/or student ego, and problem solving over content itself are all ideas underlying the Harkness method that resonated with the mathematics teacher identity I wanted to construct and enact.

The following section discusses the working conditions that made the construction of my Harkness classroom possible before the Covid-19 pandemic in the spring of 2020 forced instructional changes worldwide.

Working Conditions

I am aware that what I am about to share is extremely out of the ordinary for the vast majority of math teachers. The amount of control that I had over my working conditions was highly unusual. Being able to take control over an entire course and teach all of the sections and change its curriculum for that subject would be a lot on its own. Being able to change my classroom and my classroom furniture was very much a happy consequence of being at the right place at the right time. The working conditions that I am about to describe about the physical space and the curriculum would not be possible without an additional working condition: total control over my decision making and sovereignty in my teaching practices.

Working conditions: Curriculum. The Harkness method is a collaborative discovery process centered on problem solving and discussion. As such, this means that a textbook really cannot be used in the Harkness math classroom. Problem sets must be either adopted from Exeter, or a teacher has to write their own. I was embarking on creating my own Harkness culture in my classroom, which was weird enough, and I could not make an actual change to the curriculum, so I wrote my own problem sets using the problems from the textbook that we were using. Each day I organized a new set of problems that incorporated ideas that needed to be

practiced, while encouraging discovery of ideas that are part of the curriculum. Many of the problems were taken directly from the textbook that we had used in years prior, but some were written for the purpose of discovering new concepts. Since I wrote the problem usually after each class period, I often wrote the exploration problems in a responsive way, to include phrases that students actually used when they were articulating new ideas, which I felt underscored the fact that they were authoring the concepts that they were discovering. I did this while alluding to ideas that were on the agenda for future discussion, which helped to propel the student-centered discussion in the classroom. As one of my main objectives in using this method was to instill independent thinking, I made it clear that students were required to spend time during homework,reading and interpreting the text through drawing diagrams, writing out ideas in plain English, and writing mathematical statements algebraically. I wrote the questions intentionally— each one required that students reflect on their prior mathematical knowledge, while considering new mathematical ideas. Each problem set allowed for two major things to occur in their overall learning experience: slow growth of their understanding of geometry by building "procedural fluency from conceptual understanding" (NCTM), and strengthening their confidence in their native ability to use the associated language that describes their mathematical ideas through daily practice.

Working conditions: Physical Space. In order to make this change to the Harkness method in my mathematics teaching, I knew that I needed to change the structure of the course and the classroom space completely. I needed to dismantle everything that was representative of the typical, stand-and-deliver classroom where the teacher is in charge and knows everything, the textbook is filled with incomprehensible explanations of the concepts and blocks of problems with odd-numbered answers in the back, and where the students are passively engaged in the

transactional enterprise of doing what they are told in exchange for good grades. In essence, I needed to break down the power structure of the traditional math classroom and reorganize the subject, the students, and myself as the teacher in both the physical and psychological space so that we all were participating in mathematical problem solving. To that end, I could no longer have students sitting at desks in rows and columns, all facing the front of the room–facing me. If they were going to construct or discover the theorems and concepts through problem solving, then they needed to look to each other and grapple with the problems collaboratively, which meant that they literally needed to face each other. I could not be front and center of the room, though I naturally still needed to be part of the conversation, so that meant that I needed to sit with them–alongside them and engage in discussion with them.

The symbol that represents that philosophy is the Harkness table. At Exeter, every single classroom had a Harkness table–from English to mathematics courses.

Figure 1: Diagram of Traditional vs. Harkness
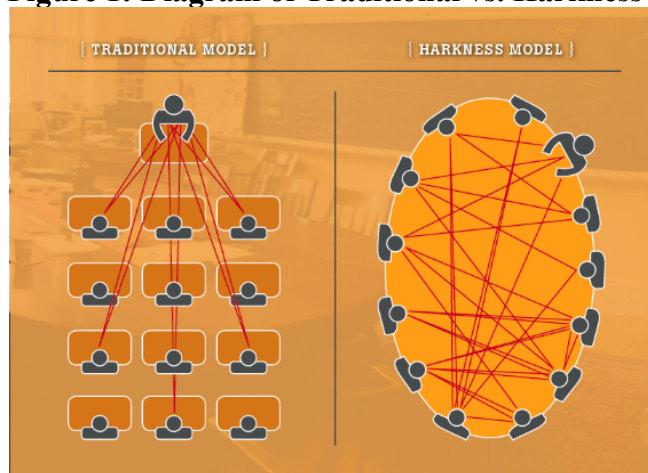
At my school, Harkness tables were used solely in English, foreign language, and history classrooms. Math classrooms were in rows of desks all facing the white board in the front of the room. In the image above, the diagram to the left is essentially what my classroom looked like

before I switched to the Harkness method. The diagram on the right is a representative diagram of what my classroom looked like with my new practice (and furniture).

The summer before I implemented my Harkness class, a classroom was being repurposed to no longer have classes, but it had a Harkness table. I asked if it could be brought to my classroom and to my delight, my wish was granted. Additionally, due to repurposing of spaces in my classroom building, I was able to move to a larger room with much more white board space. So, in a couple of swift requests, I was able to actually design a room with *the* symbol that represents Harkness learning: the Harkness table. Yes, I could still have discussions with desks that are organized in an oval or U shape, but when students who already have experience with Harkness learning in other disciplines see the table in my mathematics classroom, they already have an intuitive understanding of how they are expected to engage in my classes.

Thus, I had what might be considered an unusual amount of control over my working conditions.

1. I chose my own classroom
2. I chose my furniture

I was fortunate enough to be able to design the physical space of my classroom in order to emulate my new educational philosophy. When a student walked into my classroom, they knew that there were going to be different expectations on them, compared to the other math classes that they took at my school, and likely in their previous schools. I was able to create a physical environment that supported the habits and dispositions that I was trying to engender in my students. Not only that, I created an environment that was characterized by aspects of my own personal and professional identities by hanging my own art, student art, art prints, quotes from

students scrawled on paper, posters of philosophers and mathematicians, and even little drawings that my children made when they were little.

My Teacher Identity: What Made Me Stay in the Profession

As I mentioned earlier, this decision to use the Harkness method to teach mathematics was to solve the problem of students becoming independent thinkers and problem solvers, and that they develop a mathematical identity as students. Doing this all on my own without a support system was difficult. Teaching at a traditional college preparatory boarding school, I was under incredible pressure from students who sought to get A's in all of their classes. While most students did not claim to be "math people," they did claim to be excellent at math. That is, they did not identify as mathematicians, but they often would say that they love math because there is always one right answer to every problem. For them, being good at getting that one right answer was being excellent at math. However, when the learning experience changed from a teacher-centric course to one that relied heavily on their own initiative and creativity in problem solving, their dispositions towards mathematics and their comfort as math students changed significantly. Being so used to success, students initially struggled with the approach. I received a lot of phone calls from parents, and I spent a lot of time reassuring families that their daughters were still learning and, more importantly to them, would still get A's.

Fundamentally, I created a culture shock in my classroom. The math didn't change, but all of the rules on how to be a student did. For few students, this culture shock seemed to have little influence on their identities as math students. In other words, they were good at math no matter what. Then there were those students who struggled in typical math classes that suddenly felt capable in the math classroom. Naturally, those were my favorite students–they were my validation that the approach worked. I was able to make learning math a possibility for those

64

students who struggled the most. Lastly, there were those students who suddenly felt like everything that they knew about succeeding in math class no longer worked for them. These students thought they were good at math before, but really, they were good at following directions, working through blocks of similar exercises, and memorizing math facts. This type of student was the most challenging for me because some days, it was a true battle of wills. The pushback was substantial.

I was doing this alone. I didn't have anyone else to talk about this with–to commiserate with, to bounce ideas off of. I had to come up with new ways of understanding teaching that would help me stay true to the Harkness method. Essentially, I broke down the behaviors that I wanted to see in my students every day, and I related them to the behaviors that students engage in within subjects outside of math. This was a personal experience for me, so the subjects I chose were the ones that I spent the most time in–philosophy, art, theater, research. It is not a surprise that these domains are integral to my identity: Eileen the philosophy major, Eileen the artist, Eileen the actress, and Eileen the educational researcher. Each of these identities provided a schema through which I could organize the interactions between myself and my students and them between each other, their engagement with the content through problem solving, and through engendering a disposition of emphasizing the learning process over the need for correctness. To that end, adopting the Harkness approach did more than just transform the learning for the students,it also made the math classroom a favorable environment for me to evolve and maintain my career as a math teacher. Through the method, I was able to integrate my multiple identities and experience of satisfaction because I utilized those identities in order to understand how to encourage a process-over-correctness attitude towards doing math. I was able to access other versions of myself in the math classroom. As a result of my marriage, of

motherhood, of choosing a career that was practical over passionate, these other ways of being felt like they were re-entering my daily repertoire.

Identity Schemas

To briefly explain how I used my identities as schemas, I have displayed identity statements that relate my identity to my classroom and I have described how I used them. The one identity that I did not include that I mentioned above was Eileen the educational researcher. This is because this schema was more about how I was reflecting on my students' behavior in class, the kinds of solutions they were writing, and how these observations compared to my previous students.

My classroom is an artist's studio. My artist identity informed my Harkness instruction by providing a framework from which I could facilitate students critiquing each other's work. With my experience in my MFA graduate program, the metaphor of the artist studio in mind, I could encourage students to see solutions to problems as things that *they made*–things that they created, which were objects to be appreciated and centerpieces for discussion. Talking about where a solution to a math problem is successful or weak with the same attitude as how a group of artists talk about where a painting is successful or weak both satisfied me as a person who could successfully invent a Harkness math classroom all by myself, and also the artist in me who needs that kind of thinking and discussion to maintain my interest in the profession of math teaching. The daily ritual of standing back and looking at students' solutions on the board, at a distance, was an intentional act of emulating the art studio in my math classroom for the purpose of supporting the Harkness method, but in constructing the art studio schema in my math classroom, I was able to invite my artist identity into my teacher identity.

My class is a philosophy seminar. My philosopher identity informed my Harkness instruction by providing a framework for encouraging conjecturing and theoretical discussion about math. Harkness math requires that students dig into problem sets, give their best attempt, come to class with their thoughts, and then talk it out. Through discussion, students question each other's arguments, wonder why certain concepts "worked" or were true, and feel the urge to seek deep understanding. I found that whenever I thought of the classroom in this way, I was always referencing my experience in studying philosophy. Referencing this prior experience was crucial in changing the expectations from being the person to validate statements and provide correct answers to being the person to support student-centered deep inquiry about the concepts and the problem solving.

My classroom is an improv game. My identity as an actress, which stemmed from my experience in theater in high school, provided me with experience to pull from in order to construct my Harkness classroom. This metaphor is more specific than just acting or theater, in general–it is referencing improvisational theater. Improvisational theater often involves games where actors are given general characters and situations, and they have to act it out in free-form, without a script. These situations sometimes have particular conclusions that the scene must get to, and it is up to the actors to navigate the scene and respond to each other This statement provided me with ways of thinking about my teaching in two ways: engendering in-the-moment responsiveness among students and myself during class discussion as it evolves, and in having faith that each day's lesson will resolve through on its own through student discussion.

This statement was partly faith-based: faith in the inner logic of math, of Euclidean Geometry and its accessibility to this age group, and students' ability to use deductive reasoning to construct their understanding of geometry without a textbook or teacher lectures. This

statement was about the safety of problem solving within mathematical logic and the freedom to play with ideas and reach inevitable, correct conclusions. But this also was about the notion that teaching is a responsive activity. I was able to allow the student-led discussion to meander and then respond to their direction of inquiry. We could build the knowledge in ways that sometimes were tangential to the problems sets that I gave them and it was able to happen that way because I was willing to respond to their lines of inquiry and use that towards meeting the goal of learning specific content.

CHAPTER 5: FINDINGS

As stated in the Methods section, my research question is, "*How did the working conditions of the Covid-19 pandemic affect my teacher identity?*" Given this question, this chapter will describe the working conditions in the four example classes that I chose and my findings regarding how each shaped my teacher identity.

The working conditions are broken down into three categories: 1) the stage of the pandemic that I was in at each point in time and the institutional decisions that my school made that determined the working conditions; 2) my physical location while teaching, 3) the technology I used while teaching in each setting. See Table # for a summary of the four working conditions under which I taught in the time periods of the 2020-21 school year and 2021-22 school year. I will explain how the working conditions affected my pedagogical choices–both my teaching style and curricular decisions. With the description of the physical working conditions, I will provide diagrams that describe my location in each setting. I will describe the plan for each lesson, and then share a storyline graph that displays my interactions with the students that participated in class. I will explain each graph. I will then share the themes from each lesson with representative memos for each theme. Lastly, I will summarize the themes across the four lessons.

Table 3: Overview of Four Working Conditions

School Year	2020-2021 School Year		2021-2022 School Year	
Pandemic Stage	Month #12	Month #12	Month #22	Month #23
Name of Class	Geometry	Geometry	Accelerated Geometry	Accelerated Geometry
Mode of Instruction	Remote (February 16, 2021)	Hybrid (February 23, 2021)	Remote (December 14, 2021)	In-person (January 20, 2022)

Table 3 (cont'd)

My physical location while teaching	Home, in my kitchen at my counter	Rented classroom space in building adjacent to my school.	Home, in my kitchen at my counter	In my classroom.
Technology I used	Macbook Pro, Zoom, Canvas, Myporters, iPad Pro, ApplePencil	Macbook Pro, Zoom, Canvas, Myporters, iPad Pro, ApplePencil	Macbook Pro, Zoom, Canvas, Myporters, iPad Pro, ApplePencil	Macbook Pro, Zoom, Canvas, Myporters
Pedagogical choices	Unitized problem set emphasizing proof-writing Student problem presentations	Unitized problem set emphasizing proof-writing Student problem presentations	Combination of interleaved problem sets, unitized problem sets, practice problem sets on trigonometry	Combination of interleaved problem sets, unitized problem sets, hockey rink project on graphing circles

2020-21 school year

As shown in Table 3, the first working condition, and the class I taught (Geometry) within that condition, took place within the 12th month of the COVID-19 pandemic when my school decided to go fully remote for the first five weeks of the semester in accordance with CDC guidelines. My physical location while teaching this Geometry class was at home, in my kitchen; therefore, I used my Macbook Pro laptop with Zoom and other technologies to facilitate my remote teaching of students.

Institutional decision-making that determined working conditions. My school made adjustments to the calendar responsively throughout the 2020-21 school year based on incidences of Covid cases locally at the school level, regionally at the state level, and more broadly, at a national level. Our typical school schedule included a ten day break in November around the Thanksgiving holiday, a 2.5-3 week break in December around the Hanukkah/Christmas/New Years holiday, and a 3-week spring break. Because the school was striving to maintain as much in-person presence as possible while minimizing Covid cases, they made adjustments to the

70

schedule that minimized the number of times that students needed to travel away from/towards

campus. As we always engaged in a Covid testing and quarantining procedure when students

returned to campus which generally took three days, the shorter interval of in-person presence

between November and December break would have been impractical to have in-person

instruction. Additionally, because of the implementation of the trimester schedule, facilitating a

smooth experience for single credit half-trimester courses, and due to the practicalities of

quarantining around school breaks, school administrators made the decision to further minimize

travel. They moved the spring break that ordinarily takes place in March to a January/February

break in order to make the first five weeks of that trimester fully remote (from December 1, 2020

until February 18, 2021).

The screenshots of our school calendar below indicate the start and stop of breaks, along

with my daily academic schedule. The first screenshot shows the month of December, where the

winter term began on December 1, 2020. After almost three weeks of instruction, December

break began on December 18, which was nearly three weeks long.

Figure 2: School Calendar December 2020

The second screenshot shows the month of January, which includes the end of Winter break and

the continuation of the first half of the trimester, which was two and a half weeks, and the first

week of the January/February break.

Figure 3: School Calendar January 2021

The third screenshot shows the month of February, which shows two weeks of break and two full weeks of instruction. At this point, starting on February 13, boarding students returned to school and took Covid tests. We had remote instruction for three days while we waited for Covid test results, and my students zoomed into class from their dorm rooms and I zoomed from home. On February 18, we returned to in-person instruction.

Figure 4: School Calendar February 2021

Curriculum

Next, to contextualize my teaching experiences, I provide a brief history of our curricular changes prior to the pandemic. Back in 2017-2018, our math department switched away from the problem sets I constructed when I wrote my master's thesis. Instead, we used an adaptation of the Harkness-inspired problem sets developed at Phillips Exeter Academy, which was a more integrated math approach. The new problem set still involved discovering Geometry in a Harkness format, but it used more algebra and coordinate geometry. The concepts in these problem sets were much more integrated and relied on students' ability to work independently in order to achieve some momentum. My experience teaching during the emergency remote period in the spring of 2020 made me reluctant to continue using those problem sets. There was a lot more interleaved material, more decoding needed in each problem, and more nuance overall in the curriculum. I felt it was too much to try to manage students' understanding and detangling of such difficult problems while expecting them to apply so much prior knowledge within time limitations and lack of consistent, in-person discussions. Given these pedagogical considerations, I chose to revert back to the curriculum that I designed in 2013-14 which predated my teaching in a Harkness format, as described in Chapter 4 The problem sets were much more organized by unit, which was based on the textbook that our school had used. The experience of teaching during the lockdown (March through May of 2020) gave me a taste of what it would be like to teach via zoom in the upcoming school year. As a result, I decided to revert back to my old problem sets. These problem sets provided the following:

1. The curriculum was divided into units that were themed via concept, in a traditional manner. I decided to switch back to this curriculum because the one I was using was integrated and interleaved, which I thought would be more confusing and overly

73

complicated for the format of teaching when the working conditions would be so variable. It also meant that if students needed extra help, they could easily find it with free, online resources and the likelihood of finding tutors who could help was much greater than with the more integrated curriculum.

2. I already had these problem sets written and formatted in Microsoft word. While we were teaching in a trimester model, I knew that modifications would have to be made and I could not just use the problem sets as-is, but those changes were much easier to make in this format.

3. I had Geogebra applets that I made already to go along with this curriculum, and I felt that, given how tethered to the technology we would be, that I would use those applets.

4. My cognitive load was such that I needed to teach a curriculum that did not necessarily require discussion and included problem sets that were more like blocks of problems that were similar to each other, in order to provide the necessary practice that students needed. I fully believe in the more integrated approach, but my experience teaching during lockdown, with the difficulty in maintaining student participation and engagement in the class in a remote setting where students were tuning in to class while still in bed, led me to rely on a curriculum that supported passive learning.

February 16, 2021: Remote Instruction

Physical location while teaching. When teaching remotely, I always taught from my home. Some teachers would use their classrooms and teach from there, particularly if they had small children at home and another parent who could monitor them. I could have done that. I

74

probably should have done that. I think that since someone else was assigned to my typical classroom space, I did not feel like I could use it, even if I wanted to. Perhaps that teacher was using it. I did not bother trying to work there or ask about the space, so I just kept to my own personal space. This often meant setting up shop at my kitchen counter, and this particular day was no different. My husband was still sleeping because he had the day off due to his school district's long weekend. My children also had the day off, and they were watching television quietly in the other room.

My students were either in their homes (if they were day students) or in their dorm rooms (if they were boarding students). Students generally zoomed in from the comfort of their beds, still with pajamas on, still fully in bed, under blankets.

Technology Used. In this setting, I used my Macbook and my iPad Pro/Apple Pencil. We utilized Zoom for synchronous instruction. On my Macbook, I was logged into Zoom, Canvas, and our school website. I used Canvas as our main learning management system (LMS), and we were required to take attendance and to post homework assignments on our school website. On Canvas, I had the course organized into modules by unit, and each module contained links to the problem sets and pages with embedded Geogebra applets and questions to answer.

My iPad was used for screencasting class notes via Notability. I imported PDFs of my problem sets into the app and I wrote out solutions that students presented in class. This was the most efficient way to facilitate students presenting on their work while being able to correct their errors in the same application. I also used my iPad to collect and grade written work through the Canvas app.

Lesson Plan. The lesson I planned for that day consisted of going over the problem sets that I had assigned the night before. This was essentially the same general plan that I had for every day, with the exception of occasionally working with Geogebra applets. The Harkness classroom was much harder to implement in this setting, as it requires eye contact, students facing each other, resistance on my end to step in when they struggled. Because I was not able to create this environment, there were just certain things that I felt like I could not do. In the past, I would be able to give them a problem set that would simply state problems such as, "Prove that the alternate interior angles of parallel lines cut by a transversal are congruent," without a diagram. Students would have to draw the diagram and then proceed to recall the one postulate that I gave them in order to embark on this proof. Drawing the diagram and setting up what needed to be proved (a pair of angles) was too much abstraction for most of the students in this class, so I made an additional problem set that provided the diagrams and did not ask them to prove each theorem, specifically. The problems had them do all of the work that is actually required to do each proof. Once they completed these problems, they were then instructed to use their solutions on the corresponding problems of the original problem set (with the stated theorems and no diagrams) and see if they can contextualize their solutions to fit the theorems.

I never asked students to turn in their homework, so there was no real proof that they did or did not accomplish each task. I never checked work in a formal way in the past. Their preparedness was always apparent in class discussion. Further, students who weren't prepared for class would never make a habit of it because they always knew that I required a certain number of problem presentations per week. In this setting, I just could not hold them to such standards. Losing that eye contact and in-person, on-demand engagement made it really hard to foster independent problem solving.

Impacts on Harkness Teacher Identity

As I explained in the pre-Covid chapter, there are several criteria that make Harkness instruction possible. I will reiterate them here; Souter and Clarke (2023) determined eight key criteria for successfully building intellectual risk-taking in one's classroom (See Table 4).

Criteria for Intellectual Risk-taking in a Harkness Classroom

Table 4: Souter and Clarke (2023) Intellectual Risk Taking Criteria

Criteria	Explanation	Teacher disposition/beliefs
(1) reimagining purpose of school as egalitarian and process-based	The process of learning is emphasized over content coverage. Egalitarian community is valued over teacher and/or student ego.	Teacher ego is actively checked to be sure that it is not dominant in the classroom.
(2) creating a safe classroom community	Students trust one another to risk sharing their ideas. Teachers trust that students are putting in the effort. Students must trust that teachers will moderate class discussion fairly and effectively.	Trust and belief that the students will put in effort and reach objectives of each lesson.
(3) promoting the idea that there is no single correct answer	This criteria emphasizes the learning process over a single performance outcome.	Patience Process over correctness
(4) normalizing disagreement and problem solving	The process of problem-solving is valued over simply content coverage.	Process over correctness
(5) teaching discussion moves and expectations explicitly	To create an egalitarian classroom, teaching students to not interrupt each other, to actively listen to each other, to be more comfortable with silence in conversations and to allow each other to think before responding.	Process over correctness Trust and belief patience

Table 4 (cont'd)

(6) training students to support each other	Teaching students to be careful about the language and tone that they use and respect and value each other's contributions, rather than shutting down or condescending towards each other	Patience Process over correctness
(7) maintaining the expectation that students supply evidence for their claims	Letting students know that if they are going to make a claim, that they cannot say something without first finding the evidence to support their claim and sharing that evidence	Process over correctness Patience
(8) engaging in critical reflection	Teaching students to be active listeners and to be thoughtful about how they respond to each other. To support disagreement in discussion by supporting their collegiality and their solidarity with each other	Process over correctness Patience Trust

Looking across these eight criteria (Table 4), the concepts of trust/belief, process over agenda, the learning process over getting right answers, egalitarian community over teacher and/or student ego, and problem solving over content itself are all ideas underlying the Harkness method that resonated with the mathematics teacher identity I wanted to construct and enact.

Creating an egalitarian, process-based learning environment requires the teacher to foster supportiveness and collaboration in students, while also helping them develop their independence and confidence. The teacher and their students need to be in a trusting relationship with each other. I need to trust that my students are putting in the effort to decode and interpret each problem independently and arrive to class with sufficiently thought-through solutions to the homework problems. My students need to trust me that I will moderate each class discussion fairly and that I will step in when necessary. They need to know that I am not just going to allow

their discussion to meander in erroneous directions and that I won't just allow them to build incorrect knowledge structures. On the other hand, I need to redirect their conversation to facilitate their co-construction of correct knowledge structures–not just step in and tell them the right way to think about it. This approach requires time and patience in order to implement the approach successfully. As a Harkness teacher, I know very well just how difficult it can be to maintain the student-centered discussion. The class culture takes time to fully create. Students need to understand that the teacher behaves differently than the traditional teacher, and it takes time to convince them that the class is still safe under these circumstances.

In general, the teacher is hands-off. The teacher delegates problems to put on the board and students present them. Students ask questions and conversation evolves from there. The teacher asks questions when the conversation hits a dead end; they lean into long silences and wait patiently for students to look for their own solutions rather than waiting for me to chime in with the correct answer;they appropriately moderate discussion in order to ensure that all voices are heard. When I implemented this approach prior to the pandemic, my experience showed me just how important it was to remain fully aware of everyone in the room. It also showed me that when I leaned into discomfort and did not try to rush the learning process, students always rose to the occasion and demonstrated deep mathematical understanding.

To that end, the requisite physical working conditions for implementing the Harkness method are: *physical presence*, *time*, and a certain amount of *autonomy*. While patience, trust, belief, redirecting questions, and emphasizing process over correct answers are all integral to Harkness instruction, they cannot be achieved without time, physical presence, and autonomy. A teacher needs enough time to be able to account for the content that needs to be learned in the course, but also the nuances involved in creating the student-centered classroom culture. Time is

an integral affordance for providing the ability to be patient with students and believing in the ebb and flow of the student-centered learning process. Physical presence is important in order to be able to see and hear students as discussion evolves. The teacher needs to be able to notice the shifting in body language, listen for intonation, and use eye contact in order to navigate and sufficiently maintain the egalitarian classroom environment. The teacher also needs the autonomy to make adjustments and be responsive to the pace and trajectory of each class's learning process.

When I examined my memos from the 2020-21 Remote setting, I noticed several moments where I experienced tension with my Harkness teacher identity and the teacher that I needed to be under Covid conditions. The memos were coded both with respect to Harkness teaching criteria and with respect to the working conditions that affected my instruction. Within each memo, I reflected back to the way things used to be and how I would have navigated my instruction differently, often indicating my disposition (e.g.remorse). In what follows, I will explain each theme that emerged from my analysis and share examples, taken as excerpts from several memos from this date. After that, I will share more complex excerpts and demonstrate the interdependencies between the criteria for effective Harkness instruction and the working conditions.

Themes

Physical presence/Awareness. Each excerpt displayed is an example of the tension that I felt with my inability to see my students in a shared physical space. Without seeing their faces and their body language, I was unable to ascertain my students' current comfort level with the problems that we were investigating. Without the shared physical space, I could not see, hear, or sense the ease or discomfort that my students might have been experiencing. The shared physical

space provides a covert understanding of my students, and allows for in-the-moment decision making in order to maintain the egalitarian balance. Without this, I could not keep students accountable in real-time.

I had no awareness of the rest of the class and their participation.

I could only give my attention to whatever was right in front of me.

Sometimes a student might text in a comment into the chat, but I didn't always see it because I was busy writing down what a student was saying

In my regular classroom, I could listen to a student, look around and see other students watching the board and listening, read their body language to see if they are uncomfortable with the presentation. In this context, I don't have access to my other senses. They are totally shut down. I have to assume, based on all of my previous experience teaching, that while students are watching and listening, they MIGHT be confused or MIGHT understand something

If we were in my classroom from the start and I had my full awareness and a full year to teach, then I would have been more open to this but even then, in my class, a student presents a problem and we give them full attention and then after, we bring up our own ideas and suggestions.

I would have looked around, had her pause, and ask if students had questions or comments

This just shows that I have no idea whether my students are engaged at all. Or whether they think it is easy/hard. I have no idea. I have no clue because most students were reluctant to share or actually care enough to share, or, there were the other students who did care and it was easy enough for them and they just stayed quiet.

Zoom Presence vs. Physical Presence. These excerpts demonstrate the tension I felt with the zoom technology and the remorse I felt for not being in class together. In some instances, I empathized with students' reluctance to participate, as the zoom technology sometimes felt alienating, like one is in a spotlight on a stage. Without the solidarity that is developed from in-person discussions in the classroom and the shared experiences of togetherness, problem presentations can feel like students are just being put on the spot, one after the other. In the last excerpt, I am referring to how I asked students to imagine that we all were in

81

a room together with white boards and markers and that they were working together, even

though this particular class had never had that experience as a group. This tension was a result of

being halfway through the class and still struggling to get students to a place where they were

developing confidence and independence.

> In this circumstance, the zoom technology makes it really hard to feel the whole class presence and not feel like a spotlight is shining on them, individually

> … in class, multiple students can go to the board at once, so while one student might be talking, the whole small group can be present with the presenter. This is impossible over zoom

> This is the wear and tear of zoom instruction. This was the fifth week in a row of completely remote instruction over zoom under conditions that required remote instruction–in other words, this was not online instruction by choice

> Funny that I mention expo markers because we hadn't used that at all the whole term because it was all remote. And we don't even end up using them once we are together. I'm suggesting that we all imagine that we are in the same classroom and all are using expo markers on the same white boards--that there is a reality where we would all be in the same room with expo markers and white boards that we all use together. And we all write on the same boards. Not these little parallel universes where we all work in isolation.

Time/Process over Correctness. The tension that I felt between our new school

schedule and my Harkness instruction is seen in these excerpts. It was always an inward battle

between making sure that I was making sure that my students were able to experience the content

of a full-year Geometry course within the ten week trimester. The Harkness learning experience

provides opportunities and experiences with learning the concepts, but in this new format, my

objective had to switch to providing exposure to the concepts of Geometry. In some of these

excerpts, I am describing how I called on certain students because I could rely on them to be

accurate with their conclusions. In other excerpts, I discuss how I rationalize interrupting a

student's presentation because I did not have the time to meander in the process–I just needed to

fast forward to the correct answer.

Also, this might have been an effect of the trimester system–feeling like I need to just go, go, go. I could not afford to sit in awkward silence and be patient

If we were in my classroom from the start and I had my full awareness and a full year to teach,

Under normal circumstances, I might have waited for another student to contribute and maybe catch the error, but I never felt like I could wait around for that

With in-person instruction in year-long classes, I could lean into discomfort. Back when I did this right, I would be okay with students being uncomfortable with the silence and I pushed back on their assumption that they needed me to give them lectures.

In the interest of efficiency and a serious need for correctness, I stepped in.

I totally could have had a different student do this problem, even though it was related to the one we just did. but I really was just focused on getting the problems done and making sure that it ran smoothly.

I knew that I needed to get through material

I knew I could rely on this student because she was an active participant on her own--i never worried if she was paying attention. so at least if she was the one presenting, then the work would be at least close to correct.

While there are some clear direct tensional relationships between a specific working condition and specific characteristics of Harkness instruction, the relationships between this Harkness criteria (e.g., physical presence, time, autonomy) and the working conditions are more complex. There are interdependencies. Both time *and* physical presence had an impact on my ability to allow the learning process to play out, often giving in to the urgency of correctness. Cutting the learning process short affected trust and belief in my students, which affected student engagement and their independent problem solving. These interdependencies, as a result, affected the overall ability for the class to become a community of practice. While I did not survey my students, I can only assume that it affected their belief in the learning process, as well. We missed out on the experience of having a shared physical presence in the math classroom,

and that had an effect on developing student engagement, creating a community of practice, and developing students' trust in themselves as competent, independent thinkers.

Physical Presence and Time: Trust/Patience/Process over Correctness/Student Engagement. These excerpts demonstrate my tenuous feelings of trust in my students and the impact that time had on my need for correctness. I could not be patient with the process. As I mentioned earlier when describing the working conditions, due to the lack of shared physical presence and the lack of students' ability to write their own presentations on the shared zoom window, I took on the role of scribe and wrote down everything students said as they were reading their solutions. However, my concern with the amount of time that we had and the ability to feel a shared community in a physical classroom caused me to use my scribe role as an opportunity to correct solutions as they were being written. While the rest of the class saw that problems were being fixed as they were being explained, they did not have the opportunity to notice the errors and share their concerns. They did not have the chance to verify their evolving understanding of the concepts to correct their peers, which did not help them to develop their confidence as mathematicians.

In certain excerpts, I shared that I was using certain students as exemplar students in the problem solving process–students who mostly got it right, but had errors to fix. I made this decision because I did not have the capacity to call out students who were not engaged. Rather, I gave them an opportunity to recede–to watch presentations and to copy down solutions.

> I didn't trust that if I switched to another student that we wouldn't have to somehow start back at square one. Why? Because I did not trust that students were paying attention.

> I knew I could rely on this student because she was an active participant on her own--I never worried if she was paying attention. so at least if she was the one presenting, then the work would be at least close to correct.

So again, normally I would have students present all the way through, but this was totally different. She was dictating to me what to write down on the shared screen and so I corrected her while she went, so that it was broadcasted on the screen correctly in the first go around

To me, it was like, well students will watch this interaction and the problem will be right. They will watch us work through incorrect ideas, see why they're wrong, and then understand why something else is correct.

I think normally I would have invited more participation, but she was always just trying to say something to say something.

So this sort of response was really out of my own feelings of tension between wanting to have class participation, but wanting it to be as efficient as possible because we were on zoom.

We were 15 minutes into the class and only one student had made any real contributions. This would have normally been a conversation.

Emotional Experience of Teaching. These excerpts demonstrate a variety of instances when I was frustrated or unhappy during this class. These examples came specifically from instances when students were too reticent to present problems when I was asking for volunteers. It was commonplace during this five-week period, when I would ask specific students to try a problem, for them to reply by keeping their video off, and turn on their microphone just briefly to say, "I didn't get that one," and then turn their microphone back off. Challenging them on that and asking them to engage in trying out a problem, anyway, usually led to some kind of awkward reply that invariably led me to just presenting the problem by myself. In rare cases, a different student might be willing to share something, even if it is incomplete, just to relieve the awkwardness of the moment.

I knew that we all were not having fun.

I'm so annoyed here. I have no patience.

Recruiting [for participation]…getting annoyed…random selection

> Being the teacher that I was before, who uses conversational methods to learn math, the lack of engagement on the part of the students was wearing on me. In life before covid, I had the appropriate working conditions to "break" students of their typical math class

In the last two excerpts, I am venting about the experience of writing and drawing on the iPad. This is one aspect of the teaching experience where I felt a real loss. In normal, pre-Covid teaching, my experience writing on the board and drawing diagrams provided an aesthetic experience that satiated a need inside of me for the act of mankind art. While writing on the board was not for the purpose of making art, the experience of marking making on the board with a well-broken-in marker was always satisfying. Writing letters and numbers and drawing diagrams, as basic as that was, always provided me with little moments, albeit brief, where I could connect with my artist self. In this context, the texture of the Apple Pencil and the iPad screen frustrated me. The technology would sometimes glitch. My lines were not straight like they usually were. My circles were not nearly as good as they used to be. These used to be moments of reprieve in my teaching and in this context, they just added frustration and distaste.

> God I hate the way the notes look. I hate my handwriting, I hate the parts where I wrote over something and it looks a little messy. It is awful.

> She is engaged and explaining. I am writing everything down. My handwriting is so messy. The pencil tip is slippery and the mark is ugly.

In these examples, I was making statements about the tension between my Harkness self and the teacher I resorted to becoming, given the working conditions. These statements show how disconnected from my Harkness teacher self that I was in this lesson. Ordinarily in pre-Covid times, I would actively work to make the class egalitarian by calling on different students–by keeping all students accountable and maintaining high standards for individual student engagement. In these examples, I am reacting to the role that I was playing in the discussion. In the first excerpt, I was shutting down a student because their comment was taking the discussion

further away from the correct answer. In the second, I am disgusted by how I engaged in lecturing students about the problems, and then writing down my solution to the problem. In the last two examples, I was writing about how I used to be able to get students to openly share ideas and incomplete solutions, and to see that participating in the process of learning is more important than sharing correct solutions.

> As a teacher who strives to be responsive and flexible, this sort of response was not characteristic of my typical self.

> I talk talk talk and then I write down what I said.

> Again, this is an effect of social distancing. I never have such a hard time with getting students to try problems–even when they don't know how to fully do the problem. Most of the time, I can convince them that it is okay and that their work on the board and whatever they have to say is just the start of a full-class, collaborative conversation.

> I mean, this student was definitely doing her own work and participating. But she was the strongest student in the class. I was using her to represent to the class a student who was not perfect, but was pretty good at reasoning through a problem on her own. I was using her to show the class that it is okay to make mistakes and to fix them. but--she was easy to work with, and it was still just a dialogue between me and her. So in that regard, I was like a ventriloquist.

Executive summary

When I analyzed my notes with respect to the tension I felt between my teacher identity and the working conditions, I determined five themes: 1. Physical presence/Awareness, 2. Zoom Presence vs. Physical Presence, 3. Time/Process over Correctness, 4. Physical Presence and Time: Trust/Patience/Process over Correctness/Student Engagement, and 5. Emotional Experience of Teaching. Furthermore, these elements in combination worked against my embodying the Harkness teacher identity I wanted to enact.

The first theme, Physical presence vs. Awareness, revealed the tension I felt from how the lack of shared physical presence impacted my covert understanding of my students' understanding of the lesson and how I was able to ascertain how my students were doing, or even

what they were doing during class. The second theme, Zoom Presence vs. Physical Presence, represents the tension that resulted from my resistance to giving up on my Harkness teacher identity while knowing full well that the lack of physical presence was causing my students' reluctance to participate in class discussion while remaining, and that there was nothing I could do to change those working conditions. The third theme, Time vs. Process over Correctness, represents the constraints that the new trimester schedule that had been newly implemented that year had an impact on my teacher identity, as I felt tension between the new challenge to teach all of the curriculum for a year-long Geometry course in a single trimester. This made it difficult for me to convince and encourage students to focus more on the learning process as a reason to participate in class discussion. It also made it difficult for me to engage in the learning process, as well, as I felt the pressure to teach the curriculum in such a short amount of time. The fourth theme, Physical Presence and Time: Trust/Patience/Process over Correctness/Student Engagement, represents the interdependent connections between the Harkness characteristics, how they impact each other, and how the combination of working conditions further affect them.

Finally, the fifth theme, Emotional Experience of Teaching, involves the variety of emotional reactions I had while teaching. This theme represented my frustration and disappointment with how the working conditions actually facilitated student disengagement and refusal to lean into discomfort, and in contrast with the control that I once had of the learning culture before the pandemic. I also felt the tension between the working conditions of the iPad/Apple Pencil and the frustration, instead of satisfaction, with my personal artistic experience of writing on the iPad. Where my pre-pandemic teaching experience always included opportunities for me to receive aesthetic satisfaction from engaging in drawing and mark making just from writing on the board, I could never draw the way I drew with a marker on the board,

88

and where I would enter an experience hopeful that I would write or draw something that I could be proud of, I never was. Lastly, within this same theme, I noticed instances of how aware I was of my teaching in relation to my teacher identity. I fell far below my own standards for my Harkness instruction, and I refer to myself as a ventriloquist because I was cognizantly avoiding the disengaged students in favor of students who I knew had an answer and would be willing to act out the student engagement of process-oriented, Harkness learning.

February 23, 2021: hybrid instruction

The second working condition, and the class I taught within that condition (Geometry), took place within the 12th month of the COVID-19 pandemic when my school decided to shift from fully remote instruction to a *hybrid* instructional model, that is, some of my students attended the class in-person and other students attended the class remotely via Zoom. My physical location while teaching this class was a rented classroom space in the building adjacent to my school. I used my Macbook Pro laptop with Zoom and other technologies to facilitate my hybrid teaching of students.

Description of the working conditions that day

Physical location while teaching. This second working condition in which I taught Geometry occurred after my school shifted to a hybrid in-person and online mode of instruction. This was the fourth day of in-person instruction. Our school rented classroom spaces in a building across the street from our main campus. The building was next door to our senior dorms and my son's elementary school. It was across the street from our library and office building, and halfway up the hill between Main Street and my son's school. My son, his classmate, and I used to walk up the hill together, as far as my classroom building, and he would walk the rest of the

way with his classmate. Like many children during the pandemic, he was experiencing a lot of anxiety, and he often struggled to say goodbye to me when I had to go into my building.

The classroom was on the third floor in a small room. The space was rented out, and I think that it normally was a music practice space. The room had four or five rows of desks that our school moved into the room. Each row had three desks, each six feet apart from the one next to it. The two desks on each end were up against the wall in order to have room to socially distance. The room had one small whiteboard that I never used. There was a giant big-screen TV and an AppleTV. There were three small windows. The ceiling was sloped on one side and the windows cut into the slope. The two windows along the long wall faced our senior dorms, which were also on that side of the street. The third window looked out towards my son's school. The lighting was ceiling fluorescents. There were sufficient outlets for us to charge our computers.

The setup of the classroom brought me right back to several years prior, before I implemented the Harkness classroom. Walking into a room where all of the desks faced the front of the room was jarring. Who set this up? Not me. It made me wonder whether the setup was just because of the constraints that social distancing placed on the working conditions for teaching, or if there were inherent assumptions made by administrators and school staff about what teaching is and what classrooms are supposed to look like.

After walking up the hill from my house and then climbing two flights of stairs to get to my classroom, my face was always warm and sweaty, due to the mask covering my mouth and nose while I was doing all of that moving around. My walk up the stairs was an opportunity to try to clear my mind from the worry and guilt that I was experiencing after I had to leave my anxious son to walk up the rest of the way with his friend.

Like me, students in the physical space of the classroom wore masks in line with COVID-19 restrictions. Due to the social distancing requirements, I as a teacher was not allowed to turn the desks around to have students face each other, or have students turn their chairs around to talk to each other at all, unless they maintained six feet of distance between each other. This was almost impossible in this particular classroom because it was so small. These restrictions made it difficult to vary the activities with which I could engage students. They obviously also could not write on the same paper or be near enough to each other to really work together, so there was a risk of breaking a rule when we did choose to employ small group work. After talking to a few other teachers, I realized that many teachers were bending this rule, and I felt like I needed to, as well, so that I could engage the more reluctant students in discussion.

Technology used. Because some students continued to stay remote once classes could come back in person (on February 18, 2021), I still had to use all of the same technology in person as I did with remote instruction. The one addition to my tech hardware was a big-screen television that was at the front of the room. I used this to airplay the iPad Notability screen. I still Zoomed with my Macbook, so I set my Macbook up to face the television screen for the remote students. This meant that the remote students did not see any of their peers or me, unless I peered over to say hello. When I put students in small groups to work on problems, I would either have the remote students work together, if there was more than one remote student, or I would have an in-person student turn on Zoom in order to include the remote student in their group.

Students continued to use their computers and their notebooks and pencils. Under normal working conditions, I usually avoid allowing students to have their computers open in class. Student engagement is so critical to our daily discussions, and having their computers open invariably invites distractions. Prior to COVID-19, the only time I would ever allow students to

91

have their laptops open was when students were engaging in Geogebra explorations or graphing/calculating with Desmos. Now, because I allowed students to use their computers to see the problem sets, they likely were less engaged than they would have been in my classroom prior to COVID-19.

Diagram of the learning environment. As I already mentioned, every classroom had a big screen TV. Each classroom was also equipped with the maximum number of desks and chairs that could fit in each room, given the social distancing protocols. Thus, for my class of nine students, I had a classroom that could accommodate 12 students. It was a small, long, and narrow room where all of the desks were facing the front. There was a small white board on the wall behind the television screen that I only used one time in class.

Figure 5: Hand drawn diagram of my classroom
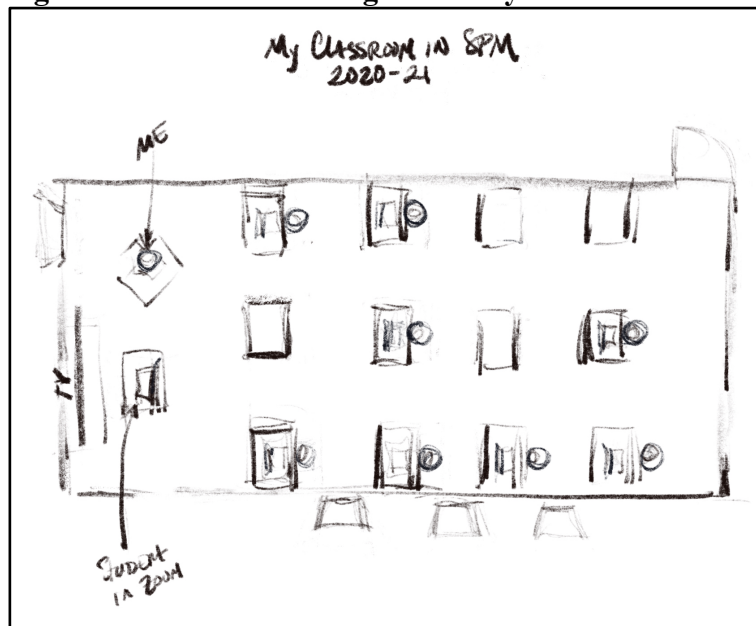
Lesson. On this particular day, students were working on triangle congruence proofs. We were using triangle congruence proofs in order to discover the properties of special quadrilaterals (for example, parallelograms, rectangles, squares, rhombuses, kites, and isosceles trapezoids). I had assigned a problem set requiring students to use triangle congruence to write proofs, and my plan was to use their solutions as a jumping off point to discover the properties of special quadrilaterals.

Themes

Hybrid instruction. When I examined my memos from the 2020-21 hybrid instructional context, I noticed many similarities with the aforementioned remote instructional context (February 16, 2021) with respect to the tensions that I experienced between my Harkness teacher identity and the teacher that I needed to be under Covid conditions. While there were some differences, they were mostly variations on the same themes. Again, the memos were coded both with respect to Harkness teaching criteria and with respect to the working conditions that affected my instruction. In what follows, I explain each theme and share examples, taken as excerpts from several memos from this date. After that, I share more complex excerpts and demonstrate the interdependencies between the criteria for effective Harkness instruction and the working conditions.

Physical Presence/Awareness: Remote vs. In Person Tension. The excerpts from the memos displayed here represent the tension I felt about what to do with the students that remained remote once we were able to return to in-person instruction. In the first two memo excerpts below, I was expressing guilt because I felt that I had less awareness of some students because they were still remote. In the second example, I was rationalizing my decision to not call on remote students, anticipating that the in-person students would have trouble hearing them.

And, whether it was true or not, I decided that these students did not want to be called on. The last example is from the end of that class, when I had decided to lean into the Harkness teacher self and call upon more students, and I called on a remote student. When the student unmuted, there was music blaring through her microphone. On the one hand, this validated my need to call on these students more frequently, in order to keep them from just logging into class and sitting at home blaring music, but on the other hand, this was not something that I wanted to invest my time caring about. There was nothing that I could do about this student blaring her music. I was not in her house and I have no idea if she was being supervised by a parent at home. I needed to just focus on pressing on and completing each lesson. I justified this "pressing on" by remembering that each class was recorded and posted to our class page.

> I always felt like I was ignoring the remote students because they weren't in the room. They were stuck in my computer and even though I was still teaching through my computer--because they were remote--they did a very good job hiding from view and often did not get called on and I never cold called on them.

> With the distance students, that felt like a tougher ask because they weren't physically present. We all would have to strain to hear them.

> Remote student unmuted to talk and was blaring music. No wonder it took her a while to respond to me...

Zoom Presence Imprints onto In-Person Presence. In-person instruction did not feel different from remote instruction. Because there were remote students in this class, all of the zoom and iPad-mediated instruction persisted. Aside from that, the social distancing component meant that students needed to sit in rows of desks facing the front of the room. To that end, in-person instruction felt like a continuation of remote instruction. When a student presented a problem, they would come up to the front of the room and read the problem while I wrote it down, just like during remote instruction. Surprisingly, and unfortunately, the social component of in-person instruction was not at all similar to pre-pandemic classroom culture. Each of these

excerpts is representative of this phenomenon. In the last two excerpts, I was making

assumptions that some students were not on task during the lesson and were engaging in off-

topic things on their computers. I was spoon-feeding them the content, along with the solutions

to the homework questions, so they really did not even need to engage in their learning.

> Even with many of us in the same classroom, each student was still existing within their own alienated realm.

> They didn't say anything. They used zoom emojis. My students in class didn't say anything either. They just looked at me with their masked faces. Sometimes they nodded. Sometimes they just looked at me.

> I had checked in with my remote students to see if they were following along and understanding. They replied with emojis.

> Every day when I go to my first period class, my students are all sitting in the room, staring at their phones, with the lights off. And when I say "hi" to them, they just look at me. Every single time. I barely get a muted "good" when I ask how they are. It makes me want to just give up.

> I already knew that students weren't paying attention in class and were on other websites, but it was easier to say "I don't care, I'm calling on them anyway."

Trimester's Impact on Student Engagement. In these memo excerpts below, I am

lamenting about the lack of agency and independence that my students seemed to exhibit as

learners, and I was attributing this lack of energy to both the trimester schedule and the unique

circumstances of teaching this particular trimester using hybrid instruction. Where the fall

trimester began in early September and ran essentially continuously until mid-November, the

winter trimester included two major, three-week long breaks, which broke up the first five weeks

of the course. Not only was it difficult to teach a full class in a ten-week trimester, it was difficult

to develop any momentum in the learning because of these substantial breaks. In the first memo

excerpt below, I am noting that students would have likely developed more independence and

might have navigated the problem sets better, as my fall term students had, if the working

conditions had been what they were prior to the pandemic.

> …and at this stage in the game, students would have had a lot more agency and capability to get through problems, had it been a normal year with a normal academic calendar/schedule

In the second and third excerpt, I was stating that the trimester schedule made it easier for

disengaged students to remain uninvested because the course would be ending soon.

> That was the reality of teaching at this time--especially in this trimester, where the experience was so partitioned as a result of the working conditions. Trying to be a student or a teacher under the circumstances meant that those who didn't really care about learning a certain subject, like math, really didn't try to do it--they just tried to fake it through.

> …in the back of my mind, I think I thought that some of them didn't care and likely did not really get much of anything out of the course and I was essentially getting them through it

Trimester/Process over Correctness. Similar to the February 16 lesson, during this

hybrid Geometry lesson on February 23, 2021, I found myself as a teacher emphasizing

correctness over engaging in the process of problem solving and learning math. In the first memo

excerpt below, I am drawing a comparison to pre-pandemic teaching, specifically how leaning

into the learning process used to strengthen the bonds between members of a class because

students were willing to make themselves vulnerable through presenting incorrect or incomplete

solutions to problems.

> That is not uncommon for the beginning of the year in normal times in my normal class, but I used those experiences and leaned into them in order to get kids used to it and to develop solidarity and trust amongst the group

In the second excerpt, I was negotiating the need to emphasize the learning process or

correctness. I rationalized the need to interject and make corrections on their presentations in

order to move the class along and continue to move through each unit in the curriculum.

…but with the way things went, even my strongest students were still struggling to get through problems on their own. and so I would interject in order to make sure we got through each problem and didn't make it be a painful experience for each presenter to be up in front of the class, visibly sharing their struggles.

Student Engagement/Process over Correctness. This theme represents the tension that

I felt with struggling to get students to present solutions. In the first memo excerpt below, I was

remarking on how I do not typically use words like "brave" because I never wanted to suggest

that mathematics is something that requires bravery. I was always striving to normalize doing

mathematics. While it might have been true for some students that it would take bravery to try a

problem at the board, to me, words like "bravery" give the impression that doing mathematics is

unusual and requires a special kind of person. I wanted all students to feel like mathematics is a

subject that can be talked about in their day-to-day lives. My main focus always used to be the

students who were the least likely to identify as math students. Since it was early on in the in-

person phase of this class, I think that I still had some hope that I could possibly draw out the

quieter, reluctant students.

> "be brave and come up here" Using the word "brave" is something that I don't typically do in my classes. I might give them pep talks and share that it does require a little bravery to go to the board, but this is not an adjective I like to use on a regular basis. I think I used the word because this was the first day in the classroom after 5 weeks of remote learning and I could tell that they were being very timid.

Additionally, the second two memo excerpts below document my reminding students about the

value of presenting problems and getting help on problem-solving from me and from their peers.

> I think I was also thinking that it would be very boring to just have me present problems, and I also saw the value of students sharing their imperfect ways of doing the problems. I actually think this was the very last thread of my Harkness instruction that I was relying on: students sharing their imperfect way of doing problems and hopefully learning that it is okay to be wrong and how to fix things when they are wrong.

> I was trying to explain to them that it is better to volunteer to do problems that they don't understand than to share a problem that they did perfectly. I was trying to convince them to participate.

Emotional Experience of Teaching. As I inquired how the working conditions of the Covid-19 pandemic affected my teacher identity, the last theme that emerged as I analyzed videos of my teaching, corresponding memos, and artifacts of my hybrid Geometry instruction, were the tensions that I experienced and my emotional experience with my teaching. Each of these excerpts represents my emotional reactions to drawing and writing, to my observations on how my students were engaging in class, and to my teaching practice. Like in the February 16, 2021 lesson, this first excerpt is another lamentation on my loss of my ability to draw and write with my iPad under these conditions. I missed the feeling of self satisfaction with my aesthetic moments, which caused me to feel even more disconnected from my artistic self than I already was in my career. These moments of writing on the board with my markers were little pockets of joy that I just did not have. The way the Apple Pencil felt, technology glitches, and the sheer lack of actual physical ink on a board all irritated me. I wanted my tactile, physical teaching tools back.

> Literally the saddest thing I've ever heard. I was just trying to draw one line segment. That's it. One line segment. Not a circle or a triangle or a rhombus. A line. And I groaned over it. As I should have. Because it was depressing. My moments of satisfaction that I used to have with my white board and markers were gone. And all my students saw were my wobbly lines and me bemoaning my loss over my skill. And I used to get something from students occasionally saying, "Wow that line is really straight" or "omg your circles are perfect." Yeah--I won't deny it.

This next memo excerpt below was an expression of frustration about my students just sitting there. Even if they were not "just" sitting there, they looked like they were. The zoom technology provided them with bad habits that I could not undo. Their masked faces, sitting at their individual desks with computers open, looking forward, at me–it often felt no different than zoom instruction. I was navigating my internal waves of frustration with my inactive students. The hope that I had with in-person teaching for more class participation was dissipating; the

amount of myself that I was pouring into my explanations, trying to be animated and passionate could not transform the fact that many of my students just continued to sit there so still and quiet. In the last excerpt, I was exasperated and listed the working conditions that were keeping me from being the teacher that I hoped to be with these students now that the majority were back in person.

I think they did expect to be able to just sit there and that did piss me off.

The room was not set up for it, the schedule was not set up for it, the interruptions made it hard, the social distancing and need for constant sterilization made it hard.

Executive Summary

When I analyzed my notes with respect to the tensions that I felt between my teacher identity and the working conditions of February 23, 2021, five themes emerged. These themes were Physical Presence/Awareness: Remote vs. In Person Tension, Technology's Permanent Imprint on Class, Trimester/Independent learners/Process over Correctness, Inviting Student Engagement/Process over Correctness, and Emotional Experience of Teaching.

The first two themes related the remote experience to the physical classroom. The first was Physical Presence/Awareness: Remote vs. In Person Tension, which represents the difficulty that I had with tending to the remote students while being in the physical classroom. The second theme was Technology's Permanent Imprint on Class, which contained tensions related to two effects of remote instruction: 1) the passive and unengaged disposition of several of the students in the class, and 2) the continuation of the technology-mediated remote teaching experience, due to the remote students in the class, and how the affected my Harkness teacher identity. The third tension, Trimester/Independent learners/Process over Correctness, represents the effects that the time constraints of the trimester had on my ability to foster independent learners without the ability to prioritize the learning process over the need for correctness. The fourth theme, Inviting

Student Engagement/Process over Correctness, was about my experience negotiating my Harkness identity as I was struggling to invite students to participate in the learning process for the sake of learning, over needing to be correct. This is related to, but different from, the last theme, Emotional Experience of Teaching which emerged as a result of my emotional reactions to the working conditions and my ability to access my Harkness teacher and my Art identities.

2021-22 School Year

The conditions for in-person instruction. The 2021-22 school year had very few remote learning days, and there was no constraint on social distancing, with the exception of wearing masks. To that end, teachers who were displaced by those conditions and given new classrooms in 2020-21 were now back in their usual classrooms. This meant that after a year of holding classes in rented classroom spaces and gymnasiums that were set up as traditional classrooms, I was finally back in my classroom, once again, with my Harkness table and my white boards. Because of these conditions, I was able to start my new class of Accelerated Geometry with students sitting at the Harkness table, facing each other and engaging in conversation. They participated in student-led discussion from problem presentations at the board. I was able to train them to talk to each other and ask each other questions, rather than directing all questions at me. I was able to teach them to use silence in discussion to think further about the concepts rather than focus on the initial awkwardness. I was able to encourage them to see themselves as having capable minds that can think mathematically and answer their own questions, rather than immediately resorting to asking me, the math teacher and authority in the room.

Schedule. Just like in the 2020-21 school year, class met every day for 90 minutes for a nine and a half week long trimester. This was the second year after having implemented the

trimester schedule. Unlike the year before, the class blocks rotated, so that each class met at a variety of different times throughout the week. There was one long vacation during the second trimester, which was December break, and it started about two and a half weeks after the term began and lasted for three weeks.

The screenshot below is the school calendar for the last week of November and for the month of December of 2021. The winter trimester began on November 30, after a 10-day long November break, and then we began winter break on December 15. We had classes for just over two weeks before we went on break again.

Figure 6: School Calendar December 2021

The next screenshot displays the month of January of 2022. We returned from winter break on January 5 for a professional development day, and then classes resumed on January 6. The next major break would not be until March for spring break (which is not shown), which would also conclude the trimester.

Figure 7: School Calendar January 2022

January 2022

Sun	Mon	Tue	Wed	Thu	Fri	Sat
26	27 Winter Break (ES)	28 Winter Break (ES)	29 Winter Break (ES)	30 Winter Break (ES)	31 Winter Break (ES)	1
2	3 Winter Break (ES)	4 Winter Break (ES)	5 Winter Break/ Faculty Professional Development Day (ES)	6 Thursday (ES) 8:45a - 10:15a Accelerated Geometry - 1 (1) 1:25p - 2:55p AIS Capstone - 3 (3)	7 Friday (ES) 11:45a - 1:15p Capstone - 3 (3) 1:25p - 2:55p Accelerated Geometry - 1 (1)	8
9	10 Monday (ES) 8:45a - 10:15a Accelerated Geometry - 1 (1) 1:25p - 2:55p AIS Capstone - 3 (3)	11 Tuesday (ES) 11:45a - 1:15p AIS Capstone - 3 (3) 1:25p - 2:55p Accelerated Geometry - 1 (1)	12 Wednesday (ES) 8:45a - 9:55a AIS Capstone - 3 (3) 10:05a - 11:15a Accelerated Geometry - 1 (1)	13 Thursday (ES) 8:45a - 10:15a Accelerated Geometry - 1 (1) 1:25p - 2:55p AIS Capstone - 3 (3)	14 Friday (ES) 11:45a - 1:15p AIS Capstone - 3 (3) 1:25p - 2:55p Accelerated Geometry - 1 (1)	15
16	17 MLK Programming Day (ES)	18 Tuesday (ES) 11:45a - 1:15p AIS Capstone - 3 (3) 1:25p - 2:55p Accelerated Geometry - 1 (1)	19 Wednesday (ES) 8:45a - 9:55a AIS Capstone - 3 (3) 10:05a - 11:15a Accelerated Geometry - 1 (1)	20 Thursday (ES) 8:45a - 10:15a Accelerated Geometry - 1 (1) 1:25p - 2:55p AIS Capstone - 3 (3)	21 Friday (ES) Winter 1/2 Trimester 1 Ends (ES) 11:45a - 1:15p AIS Capstone - 3 (3) 1:25p - 2:55p Accelerated Geometry - 1 (1)	22
23	24 Monday (ES) Winter 1/2 Trimester 2 Begins (ES) 8:45a - 10:15a Accelerated Geometry - 1 (1) 1:25p - 2:55p AIS Capstone - 3 (3)	25 Tuesday (ES) 11:45a - 1:15p AIS Capstone - 3 (3) 1:25p - 2:55p Accelerated Geometry - 1 (1)	26 Wednesday (ES) 8:45a - 9:55a AIS Capstone - 3 (3) 10:05a - 11:15a Accelerated Geometry - 1 (1)	27 Thursday (ES) 8:45a - 10:15a Accelerated Geometry - 1 (1) 1:25p - 2:55p AIS Capstone - 3 (3)	28 Friday (ES) 11:45a - 1:15p AIS Capstone - 3 (3) 1:25p - 2:55p Accelerated Geometry - 1 (1)	29
30	31 Monday (ES) 8:45a - 10:15a Accelerated Geometry - 1 (1) 1:25p - 2:55p AIS Capstone - 3 (3)	1 Tuesday (ES) 11:45a - 1:15p AIS Capstone - 3 (3) 1:25p - 2:55p Accelerated Geometry - 1 (1)	2 Wednesday (ES) 8:45a - 9:55a AIS Capstone - 3 (3) 10:05a - 11:15a Accelerated Geometry - 1 (1)	3 Long Winter Weekend - No Classes (ES)	4 Long Winter Weekend - No Classes (ES)	5

My curriculum decisions based on working conditions. In the 2021-22 school year, I reincorporated the integrated geometry curriculum (which aligned with the Harkness method of math instruction), but I did not fully return to this curriculum. Like the year prior, I was the only teacher who was teaching Geometry in the 2021-22 school year, so I was able to make decisions on what materials I used and what curriculum I would teach based on what I felt I could reasonably complete in the trimester schedule. To that end, I used it as a year to ease back to the integrated math curriculum and with that in mind, I incorporated a number of different materials that I had built over the last several years–including the adapted problems sets I used in the 2020-21 school year, problems from the integrated math curriculum that we had been using before the pandemic, the Geogebra applets that I had made, and the modules that I put together from review/preview courses that our department had written in the summer after the emergency remote period (summer of 2020) in order to prepare students for the upcoming school year, given the learning loss due to the emergency remote period of 2020. These courses were in Canvas, and it was easy to move modules from these courses to the Canvas course that I built to store the materials for this course.

The preview/review modules were definitely a way in which I could deliver certain content quickly in order to cover the Geometry curriculum in a trimester. To that end, I was still utilizing teaching tools that corresponded with a 'delivering content' approach to teaching (in contrast to the Harkness method). As already mentioned, these modules were built in order to provide a review of previous content and preview of new content, which allowed me the opportunity to manage the wide range of prior knowledge amongst the members of the class. These modules helped to facilitate productive in-class discussions so that we could focus on problem solving and discovering new concepts. For instance, before we engaged in coordinate geometry problems, I assigned students to complete Canvas modules that reviewed Algebra 1 concepts, such as finding perpendicular and parallel lines, and using the distance formula to find distances between points. Because I made these modules in Canvas and incorporated Geogebra applets that I had also made (or adapted from applets that I found), it was much easier to choose to use these teaching tools for certain topics in order to manage the time constraints of the trimester system. Thus, in the 2021-22 school year, I was using technology in a more intentional way than I had previously; I was making choices to use technology for specific reasons, rather than being forced to use technology as the main intermediary to facilitate learning as had been required during the pandemic lockdown when all classes remote.

Not only did I use our learning management system (Canvas) and Geogebra in intentional ways, I also made more intentional decisions about what I would teach when I had to teach remotely. Remote learning days were much fewer and farther between in the 2021-2022 school year; therefore, when we had those days, I often would teach a topic that required a procedural skill set–similar to the topics that were covered in the preview/review modules. For instance, trigonometry equations and where/when to use them was a topic that I taught during remote

learning days. I would have ordinarily built a problem set that required students to discuss their solutions in order to achieve a deeper understanding of right triangle trigonometry, but given the trimester model, I used a remote instruction day to just tell them the formulas and show them when and how they are used. So in this regard, I utilized the zoom technology for a 'delivering content' purpose.

December 14, 2021: remote instruction

The third working condition, and the Accelerated Geometry class I taught within that condition, took place within the 22nd month of the COVID-19 'post' pandemic context when my school decided to offer some remote learning days but mostly returned to in-person instruction. My physical location while teaching the Accelerated Geometry class remotely was at home, in my kitchen; therefore, I used my Macbook Pro laptop with Zoom and other technologies to facilitate my remote teaching of students.

Working conditions: physical location. Since this was a remote day, I was back to teaching in my home. Even though my students and I had returned to our regular classroom spaces at the start of this trimester, I chose to stay at home for remote teaching days. My students were either in their homes (if they were day students) or in their dorm rooms (if they were boarding students). Students generally zoomed in from the comfort of their beds, still with pajamas on, still fully in bed, under blankets.

Technology used. In this setting, I used my Macbook, my iPad Pro, and Apple Pencil. I also used: Zoom, the web conferencing tool, Notability, an iPad app for writing on and sharing pdfs, our learning management systems (Canvas and Blackbaud) for organizing course content and recording grades, and Geogebra, for providing opportunities to engage with the mathematics in an interactive way.

Just like in the Remote 2020-21 setting, I used my Macbook and my iPad Pro/Apple Pencil (a stylus made by Apple that is used with iPads). On my Macbook, I was logged into Zoom, Canvas, and our school website. I used Canvas as our main learning management system (LMS), and we were required to take attendance and to post homework assignments on our school website. On Canvas, I had the course organized into modules by unit, and each module contained links to the problem sets and pages with embedded Geogebra applets and questions to answer.

My iPad was used for screencasting class notes via Notability. I imported PDFs of my problem sets into Notability and I wrote out solutions that students presented in class. This was the most efficient way to share notes and instruct the class on new procedures. I also used my iPad to collect and grade written work through the Canvas app.

Lesson plan. Because we shifted to remote instruction for the two days leading up to winter break, I modified the order of some of the content. As I already described in the Curriculum Decisions section, the few days where class was remote, I chose to teach very algorithmic material. So on this day, I taught right triangle trigonometry: the sine, cosine, and tangent of an angle in a right triangle. I had a worksheet that was a block of straightforward problems for students to practice the procedures. The class was short that day because I had a doctor's appointment, so I answered questions that students had from the homework the night before and then went over the procedures for finding the angle measure when given two sides of a right triangle using the trigonometric functions.

Themes

At this point in time, we were two weeks into the winter term of the 2021-22 school year. With the exception of the mask mandate, things had transitioned back to normal operations at my

school, with occasional exceptions, and this day was one of those exceptions. For those first two weeks of the term, we had been in person, and this particular day was deemed a remote learning day in order to mitigate flu cases. As I looked at the video of my teaching on this remote learning day as well as the memos from that day, four main themes emerged. These themes were Technology Affordances/Constraints, In-Person Presence Imprints on Zoom Presence, Zoom Existence Vs. Zoom Use, and Emotional Experience of Teaching. These themes demonstrate my shift in the way I used the technology, my attitude toward the technology, the way in which my students engaged in the technology-mediated remote class, and my affect during this period.

Technology Affordances/Constraints. This theme derives from a collection of memos where I am talking about the affordances and constraints of using technology for my teaching. The first two excerpts are comments on the *affordances* of the technology for instruction. I was recalling how it was beneficial to have the document of the homework assignment and to be able to highlight and write directly on it as I was explaining how the Geometry concepts related to each other in the problem. In the second memo excerpt below, I even mention that the drawing of the calculator I did was awful, but it did not have the same effect on my emotional experience of teaching as it did in the year prior.

> It's definitely handy to be able to highlight and talk over my writing/highlighting at the same time. It's not a complicated concept or lesson, but it would be handy to have this technology for complex concepts…I was appreciating the technology. I think that I was noticing this so much because we were in person before–not using this technology in almost a year, and having been back to writing on white boards with markers, it was interesting to go back to writing on a document with an apple pencil.

> I'm drawing and highlighting as I am talking, and it is pretty handy. The drawing is awful. But I think I make these equally as awful when I have my white board and markers.

The next two memo excerpts reveal the tension that I felt when confronted by the constraints of AirPlay - a proprietary wireless communication tool developed by Apple Inc. that

106

allows streaming between devices of audio, video, and photos - when sharing my iPad screen to Zoom, which was running on my computer. In these moments, I would be busy writing and talking and looking down at my iPad, and a student would chime in to tell me that the screen was frozen, which meant that the connection between the computer and the iPad was no longer updating. This happened so often, and it was one of the main technology glitches of the previous 2020-21 year. In the previous year, these technology failures sometimes affected my ability to run my class because, as mentioned in the second memo excerpt below, the technology was making my ability to run class possible.

> here we are with technology again

> this is me just hoping for the best...because the technology, which is what is making this class possible, is failing.

In-Person Presence Imprints on Zoom Presence. The excerpts displayed here represent student engagement in the zoom environment. In the first memo excerpt below, a student had asked a question about why her answer was incorrect, and before I had opened my mouth to reply, another student chimed in to tell her that it was a problem with the mode on her calculator. I had assumed that, just because we were on zoom again, that class was going to operate the way it had in the winter term of 2020-21. Since the class had already met in person in my classroom for two weeks before this remote class, the teacher-centric dynamic that I assumed for this remote class was interrupted by the already-established student-centered norms from in-person instruction.

> This was remarkable to me--I remember the moment when a student actually chimed in to respond to another one on zoom. This made me feel a lot better about this day's class. It wasn't just going to be talking into a vacuum of black rectangles. I wouldn't be pulling teeth to get anyone to say anything at all. There would be no ventriloquism. I was super relieved.

Responses via zoom emojis. It didn't frustrate me. This was clearly an information-out type class.

I'm calling in and incorporating their tech-replies, and we all are somehow understanding the underlying joke--of like being live and having our voices, but still using emojis like we are texting. very peculiar merging of different ways of communicating and narrating about the communicating at the same time. it's like "communication inception."

The latter two memo excerpts above were taken from instances when the whole class replied to something I said. The first of the two memos documents my reaction to their emoji responses to my asking if they understood what I had just explained (i.e., "Responses via zoom emojis. It didn't frustrate me. This was clearly an information-out type class"). In this instance, I was comfortable with the emoji replies, and I wrote that it had to do with it being an "information-out" class, which is the terminology that we use for zoom faculty meetings where we are just given updates and information about upcoming events, etc. It is for meetings where in-person presence is not necessary for the objectives of the meeting, so the meeting is held on Zoom. I used the term in this memo because I chose to utilize the remote class as an opportunity to teach material that I had not planned on building exploratory problems to learn the concepts. Given that the lesson was on simple trigonometric equations and using them in straightforward practice problems, I used the term "information-out." However, since students had already asked and answered each other's questions out loud in this class, I did not question that their emoji confirmation was not just a complacent, disengaged response.

The last memo excerpt was taken from when we were saying goodbye at the end of class. This last excerpt was different. We were laughing together at the way we were communicating; they shared emojis and comments in the text chat, and I was reading these communications to them. Had this remote class happened before we had ever met in person, I do not think that we would have noticed there was something to laugh at. However, because the class dynamic had

already been established in person, although we had only met for two weeks prior to this remote teaching day, there was enough foundation built in order to have a collective understanding of the humor in the awkward zoom communication. To that end, our experience saying goodbye was much more playful than it was in the 2020-21 school year. The way we were using and reacting to the affordances of Zoom allowed us to laugh at how the medium was diffracting our communication, as if the Zoom space was a room full of warped mirrors in a fun house, and we were hysterical over how the mirror warped the reflections of our bodies. The Zoom space warped our goodbyes, and we had built enough community in those short two weeks of in-person instruction that we could engage in the silliness of the moment. the remote environment as a temporary moment, not as a phenomenon that provided momentary moments of togetherness in an otherwise alienating experience whose duration was uncertain.

Zoom Existence vs. Using Zoom. The excerpts in this theme indicate the ontological difference between the expectation of having to exist in zoom and the ability to use zoom. In emergency remote instruction in 2020 and in the 2020-21 school year, zoom was a necessary mechanism to conduct regular, daily instruction. There was no other way to interact synchronously, and oftentimes, the duration of our zoom instruction phases was indefinite. To that end, zoom was a place where we existed. As mentioned in the previous theme, my history with zoom affected my expectations of being on zoom in this circumstance. The first two memo excerpts below depict me anticipating zoom as an existential state of being. Even though I knew that zoom instruction would be temporary, I still felt dread.

> I remember turning the zoom on a little early and saw students populate the waiting room just as I turned it on and I remember feeling a sense of dread. I hated zoom. If I was going to be home, couldn't I just be home and not working?

> So being on zoom--two days before winter break was going to start--was a serious drag. And watching those students begin to populate the waiting room just gave me flashbacks

of lockdown and the class I taught the year before, where students reluctantly showed up, laying in their beds.

As I mentioned earlier in the curriculum decisions section, I made different kinds of decisions about what to teach while in the remote setting. Knowing that remote instruction was temporary and infrequent in this 2021-2022 trimester, I was able to make particular pedagogical decisions based on what I knew I could expect from my students and from myself. Because of that, I taught the formulas of right triangle trigonometry As indicated in the second memo, my perception of zoom shifted to seeing it as a tool that I used in order to teach particular skills.

> …and finding it a lot easier to be on zoom when it is not the main way of knowing them. It's a lot easier to accept it in the short term and maybe that's why I'm able to be openly in angst about the technology when it fails.

> But also knowing that it wasn't an indefinite state of being (being on zoom) meant that we could take it for what it was worth. I could use it to teach something really basic and algorithmic and not try to have student-driven conversations about math, which would inevitably fall short of my high expectations, anyhow. I could just have a live tutorial and students could just answer their simple questions. With such a short duration of zoom, I could actually use the technology intentionally. And that put me in control.

Emotional Experience of Teaching. Memo excerpts from this third working condition (remote instruction in December 2021), revealed instances when I am experiencing a strong emotional response to teaching. The feelings that were categorized under this theme were generally my satisfaction from feeling connected to my students and my feelings of frustration from malfunctioning technology. The first three memo excerpts below depict instances where I was expressing appreciation about this particular class. It was a diverse group of students from different social circles and backgrounds, but the class was collegial, students respected each other, and they were genuinely interested in learning Geometry. Even in the remote setting, they expressed enthusiasm. In this regard, my Harkness identity, which valued genuine student

110

interaction, rather than a mere transactional relationship, was satisfied, despite the fact that the

lesson plan was more teacher-directed.

> It was a total cross-section of different social groups and they worked so well together. Every so often, you get a class that feels like a family just sitting around a table. And they respected each other, despite whatever social group they were from. Being in class, in my classroom, was a joy.

> But I really liked teaching this class. This class, along with my stats class, was the apex of all of my sections that year. It was the perfect combination of students.

> So much more enthusiasm. So connected to this class.

In the previous 2020-21 school year, my frustrations about student engagement, about the

technology glitches, and about the working conditions were largely contained inside myself. I

did not let them out. On occasion during the earlier pandemic context, I would express my

frustration about the technology glitches to my students as they happened, but there was always

so much more emotion going on under the surface. Thus, in the previous school year, I was

keeping myself under control in the presence of my students because it was understood that we

all were going through a lot–especially the students; the last thing I had wanted to do was

overshare about how much I hated teaching on zoom, particularly since there were students who

opted to remain remote. I also did not want to experience backlash for any opinions. School is

not just school–it is a business, and the customer is always right. It is up to the teacher to

maintain the face of the school and provide for the students.

However, during the 2021-2022 school year, as the last three memo excerpts below show,

I was not negotiating the conflicting versions of myself–the outward, controlled math teacher self

and the self that has personal feelings and opinions as I had felt compelled to do in 2020-2021.

Now, in this school year, the emotions I felt in the moment were openly expressed, and I did not

feel worried about how those feelings would be misconstrued. I knew that my students

understood and also felt the frustration of the malfunctioning technology:

> technology freeze! frustration.
> I feel like I'm less afraid to share my feelings with these students. i sound more frustrated with the technology in this lesson than i did with the previous year

> "It's like a little version of hell"
> I shared that with them. That it is hell. Well I guess that is okay. And this is exactly how I felt.

> "terrible drawing of a calculator:" it's like i already know that is going to happen with notability, so i am owning it in advance so i don't feel so frustrated and disappointed to not make something cute.

Executive Summary

When I analyzed my memos with respect to the tensions that I felt between my teacher

identity and the working conditions of December 14, 2021, I determined four themes overall.

These themes were Technology Affordances/Constraints, In-Person Presence Imprints on Zoom

Presence, Zoom Existence vs. Using Zoom, and The Emotional Experience of Teaching.

The first theme, Technology Affordances/Constraints, had to do with my attitude toward

the iPad/Notability/AirPlay technology. In several instances, I was able to appreciate specific

affordances of the technology that I did not ordinarily have in my in-person classroom, such as

the editing features and my ability to easily share my notes to our class folder. The theme also

captured the constraints of AirPlay, and how it frequently malfunctioned, which would interrupt

the flow of class.

The second theme that emerged, In-Person Presence Imprints on Zoom Presence, had to

do with what I perceived as the in-person class dynamic carrying over into the remote setting. As

the norms of the Harkness classroom had already been established, students had no trouble

engaging in the class in the remote setting by asking questions and answering each other's

questions. While I had planned a teacher-centric content delivery class, it was noteworthy that students were participating more than I had anticipated.

The third theme, Zoom Existence vs. Using Zoom, emerged from the more broad realization that the temporal nature of the remote setting changed my disposition towards the remote learning experience. Where in the 2020-21 school year the remote learning setting had lasted for five weeks and there was always concern that we might have to continue or return to the setting, my disposition towards the remote setting felt like existential dread. Thus the long periods of time and, to an extent, the indefinite periods of time of the remote setting resulted in a feeling that zoom was a state of existence. In this new setting, since remote learning was so brief, I was able to think proactively about what to teach that day that could benefit from, or at least not be constrained by, the affordances of Zoom.

The fourth theme, The Emotional Experience of Teaching, emerged from my emotional reactions in this setting. These reactions were frustration and joy/satisfaction. Frustration occurred with respect to the malfunctioning AirPlay connection between the iPad and the Zoom on my laptop. It also occurred to me when I was drawing on the iPad, though the level of frustration with the drawing was minor in comparison to my experience with this in the prior year. It is noteworthy that I expressed these emotions out loud in this class, versus refraining in the previous year. Joy/satisfaction occurred with the feeling of connection that I observed with the class as a whole. I felt satisfaction from experiencing the mutual respect between members of the class, which was a result of establishing class norms during in-person instruction. As a result, the interactions between students and in our salutations at the end of class were not just transactional.

113

January 20, 2022: in person instruction

The fourth and final working condition, and the Accelerated Geometry class I taught within that condition, took place within the 23th month of the COVID-19 'post' pandemic context; My school had returned to in-person instruction since December 2021. My physical location while teaching the Accelerated Geometry class in-person was in my classroom; I used my Macbook Pro, Zoom, Canvas, Myporters when teaching this class.

Description of the working conditions that day

     Working conditions: physical location. My classroom building houses the science department, several math classes, and the art department. One side of the building faces our school library, and the other side faces a street where many faculty houses are located. The house right next door is the one where my family and I reside. My classroom is the classroom that I moved into in 2013 and it looks much the same as it did then. On two opposing walls, there are bulletin boards covered in cool mathematician and philosopher posters, artwork, quotes that students said over the years, drawings that my children did, a box of captain crunch cereal that a student gave to me for Christmas, a "family photo" of a class that I had 5 years ago, a cabinet full of books and miscellaneous things. There are legos. There are sculptures that a student did several years ago from a class that I taught in our now-defunct January term program. There are two large white boards on the other opposing walls of the room, where students have plenty of space to put problems up on the board. There are two stickers on the walls that say "Wear a Mask and Disinfect Work Surfaces." There is a ceiling-mounted projector that projects onto the white board. There is a green leather couch with two colorful throw pillows where students like to lounge during break and before class. There are three classroom desks, one teacher desk that is covered in papers and old Statistics projects, and one large, oval Harkness table with several

chairs. Harkness tables are not in any other math or science classroom in the building. There is only one other Harkness table in the building, which is in the art history room.

Figure 8: Hand drawn diagram of classroom
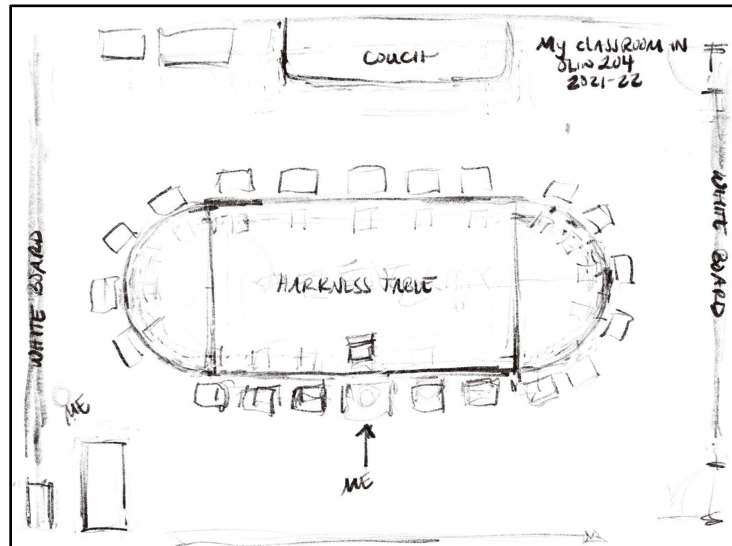
Technology used. I used my laptop, classroom projector, white boards, and dry-erase markers. I also used Rocketbook Beacons and my phone to share class notes, which got sent to a shared Google folder. I only used my laptop and projector in order to Zoom the one remote student into class. I used Canvas and Blackbaud for managing content and communication about assignments.

Students only used the white boards, markers, notebooks, and pencils. They used the Google folder to review class notes in the shared folder. They used Blackbaud to find out each night's assignment and Canvas to retrieve each assignment's materials.

Lesson Plan. As mentioned previously, this class was utilizing a hybrid problem set that I composed between my original problem sets, which I had used in the previous year, and the integrated problem sets that our school had adopted that were written by Exeter. In addition, though, I had come up with multi-class activity about graphing circles. This was a small group project where each group needed to construct a hockey rink in the Desmos graphing app. The

activity taught students about translations on the coordinate plane and what needs to be done to the circle equation in order to make the right size circle in the right position on the plane. It also taught them about how to restrict the domain and range in Desmos, as they needed to graph half- and quarter-circles. Some of the activity was done in groups, but some of it was done individually. The overarching concept that students explored in the problem set that I assigned them the day before was the concept of equidistance. Circles are an example of this, as a circle is the set of points that are all equidistant to a single point. As we had already been talking about circles for a few days, those questions incorporated problems that would help them prepare for their small group work in the rink activity. The other questions in the problem set were more exploratory, and were meant to have students begin to think about what happens when points are equidistant from two points. These questions were essentially preparation for a discussion on perpendicular bisectors. My hope was that we would get through the circle questions easily, and then transition into a deeper conversation about equidistance. By the end of the class, we achieved these goals, but we did not finish every problem in the problem set. This was common, and I would often reassign the last couple problems and then adjust the following night's problem set accordingly.

Themes

As mentioned earlier, the winter trimester of 2021-22 class began in-person and in my usual classroom. Being back in the classroom meant that I could return to enacting all of the characteristics of Harkness instruction in which I believed. I could be more patient and wait for students to respond to each other, or I could push them more when they directed their questions towards me, and I could redirect those questions back to the class. I could assign students homework problems to present in class and encourage them to try presenting problems with

116

which they were not comfortable. I could do this in the spirit of emphasizing the learning process over correct answers. I could trust that students would become more independent and begin to rely on their own minds to verify whether something was true or not. Additionally, I could find more satisfaction in my artistic self as I utilized the markers and white board while facilitating discussion. To that end, the themes in this section do not represent tensions, but rather, revelations about what I had missed while teaching during the 2020-2021 pandemic.

Process over Correctness. The excerpts in this theme represent the way that students respond to feedback, how they engaged in discussion, and how they responded to my requests to elaborate on their answers. In all three of the memo excerpts below, I recall remembering that I did not have to worry about students somehow failing to respond or acting reluctant to ask questions or make corrections to their work. Students were engaged and ready. To that end, this theme emerged as a result of the remarks that I made about student engagement. These excerpts represent my observations while I was watching the lesson about their willingness to participate in class in the way that I trained them. In other settings, my memos represent my memories of what I was thinking and experiencing in the actual teaching moments. This theme represents retrospective observations I was making in relation to my experience teaching in the prior year.

> Students are very inclined to talk and write while presenting--to fix their work while they are presenting. It does not seem to be an embarrassing moment for them even when they are wrong.

> In this moment, a student had to correct her work, and I noticed that they took the feedback in stride. It wasn't a big deal. No one was terribly embarrassed.

> It's just an open conversation with the student at the board. Asking the student questions doesn't alarm them, and they are each comfortable enough with their knowledge that they can more or less respond with a little confidence.

Teacher-Mediated Student Discussion. While I strived to return to Harkness methods for teaching math, some days were more successful than others. On this particular day, the

instruction could be characterized as teacher-centric student discussion. This means that the

discussion was prompted by students' presentation of their math problems, but for the deeper

problems that required more exploratory conversation, I stood at the board and moderated the

discussion. Different students had varying ideas; I both helped to encourage more participation

and more ideas from more students, and I was molding the discussion knowing which direction I

wanted it to go in. I took a more central role to the conversation than I would have, had I been

leaning into patience and allowing them to take more control. The memos do not mention why I

felt like I needed to harness control, but my recollection is that I knew that I needed to move the

lesson forward because we still had the 10-week trimester schedule. In the first memo excerpt

below, I was relating the ideas that two different students had in order to discuss an overarching

topic. I was animated and theatrical, which is something that I enjoy, but it is also contrary to the

Harkness method. As mentioned in the Pre-Covid chapter, the Harkness method requires the

subjugation of the teacher ego. The priority in the Harkness class is to amplify student voice, to

support student agency and independence, and to encourage intellectual risk-taking in collegial

discussion. When a teacher's presence dominates the class, this can impact students' buy-in in

believing in the learning process. In the second memo excerpt, I describe the students' role as

"audience participation," which is opposite to what it should be, if my focus was true Harkness

instruction.

> I'm recapping what the student said … talking about what this student knows … I'm recapping what another student said … talking about what the student knows… comparing two ways of knowing--knowing a particular thing versus knowing an overarching concept…I'm animated, and when I hear myself talking and recapping what each student did, I hear myself creating a story in a comic strip sort of way. … "and that is all I know" --sort of an existential moment.

> So there were a lot of students in this class and in this discussion, I think 4 students made major contributions to the discussion in an investigative, speculative way. My role was summarizing the discussion through collating their thoughts and replaying the scene. It

was still theatrical, but not puppeteering. Their role was like audience participation, but it was still their ideas that were fueling the discussion.

I feel like I am enjoying myself here and my students and I are having a mutually interested conversation, for the most part. like I feed off of them when I know that they are engaged in the learning, as well. Who wouldn't want that? What teacher wouldn't be more engaged when their students are more engaged?

All of this being said, there are no indications in these memos that I am struggling to be a Harkness teacher. I am not negotiating identities, nor experiencing tension between conflicting agendas. I think that I was satisfied enough with the amount of participation that was already happening in this particular class. There were other days where the conversation was more student-centric than it was on this day, and I was satisfied with this amount of participation in a lesson where we were discovering a new abstract concept.

Emotional Experience of Teaching. My memos from this fourth working condition, as in the other three conditions, express my satisfaction during the teaching experience. The majority of the memo excerpts displayed for this theme involve my reactions to drawing on the white board. I felt personal satisfaction when drawing on the board, which was something that had nothing to do with teaching math. I could have been drawing in another setting–in my sketchbook, on a wall, on the sidewalk–and I would have still been experiencing this satisfaction. However, as my life was occupied by parenting, teaching math at a boarding school, and being a doctoral student, I did not have much opportunity to draw. I did not realize how important these little drawing moments in my teaching were to me until the pandemic hit, and these moments were taken away from me. These moments drawing at the board sustained me in ways that I understand more now than I did then. I am an artist who had to prioritize motherhood, family, and work over making art. Those diagram sketches in my classroom, and the calligraphy of my notes on the board, were like an IV drip for my artistic life, which had sustained me for years.

119

There would be times after class when I would sit and just look at my drawings on the board, in the same way that I would when I would examine my studio walls in graduate school, and feel satisfaction and some relief that my other self was still there–like an acknowledgement to the artist who was still in there, still breathing, and actually, still evolving. The pandemic removed this lifeline from my professional life, and in no uncertain terms, I suffered. Being back in my classroom again in January 2022, drawing circles and writing my notes on the board revived me. It is apparent from reading these excerpts that I spent more time drawing my circles than was necessary, and perhaps technology might have been a more efficient tool for the purpose of getting my point across, but the real-life drawing on the board with a marker satisfied my personhood, and liberated me from the the pandemic teaching role that I needed to assume in the year prior.

Being back in the classroom liberated me from the controlling role of Deliverer of Content in the constricting technology-mediated environment. It is as if the technology-mediated teaching and the trimester schedule held my shoulders firm, shook me, and reprimanded me and said, "You are a math teacher. This is all that you are. Instruct on math." The social distancing measures and the trimester schedule made the experience feel like I was shoveling content at my students, day in and day out. While the working conditions of teaching during the 2020-21 school year were inconsistent and different from what we were used to, the teaching, itself, was controlled by the mandate of delivering the content under such constricting working conditions. I was caged back up like I had been before I adopted the Harkness method. It is no wonder that students were so reticent. We all were going through the motions of the transactional teaching process and enduring the anxiety, which was exacerbated by social distancing. Yes, I still had a Geometry curriculum to teach in the current setting, but being back in my physical classroom

120

having in-person, responsive conversations around my table and drawing with real ink on real

walls was liberating.

> I was drawing a small-ish circle and fixing it and then drawing a line through it and highlighting the points of intersection. I felt so competent--like I was in full control of my ability to explain and illustrate in my unique way of doing things. I am the teacher who can draw straight lines and really good circles. and I could be that teacher in that moment. And that feels good to watch, and it felt good when I was in that moment.

> I spent 27 seconds drawing the circle. I looked at it, and erased little parts to make it look good.

> I groaned about my drawing--funny because it was so much better than on the ipad and the experience making it was so much better, but I still groaned about it. I mean, that's how I am when I draw on paper with pencils and charcoal. I think that I am always striving for excellence on some level in my drawing. This kind of struggle is different from the 2020-21 year with the ipad because then, I was fighting with the technology and finding it impossible to access these satisfaction moments that were always there before, when things were normal. Now it is back to normal and my struggle is the typical struggle with drawing–with the satisfaction of being able to eventually get it right because I was in control with the markers and white board that I was comfortable with. Being able to use my talent and control the way things look was so important to me.

> I am drawing my diagram with care and precision, though relatively quickly. It is a quarter circle with horizontal and vertical lines tangent to the curve and also the x-y axis passing through. A student said, "That looks good!" and I said, "Thank you." I was definitely pleased with my drawing and was charged by my own satisfying moment.

Executive summary

When I analyzed my memos with respect to the tensions that I felt between my teacher

identity and the working conditions of January 20, 2022, I determined three themes overall.

These themes were Process over Correctness, Teacher-Mediated Student Discussion, and The

Emotional Experience of Teaching. These themes address the enactment of my Harkness teacher

identity and my Artist identity in the in-person classroom.

The first theme, Process over Correctness, represents my observations about how the

students engaged when presenting their work at the board, how they responded to feedback, and

how they engaged in discussion with the exploratory problems. The resilience and openness of

my students as they were taking feedback from their peers and me in real-time was characteristic of a Harkness classroom.

The second theme, Teacher-Mediated Student Discussion, represents my observations on how I engaged in a more teacher-centric discussion within the context of enacting the Harkness method. I engaged students in discussion about perpendicular bisectors, and students offered ideas and supplied their reasoning. My job in synthesizing their ideas in order to support the entire class in discovering the concept was to maintain student authorship of the ideas, while maintaining the momentum so that there was closure on understanding the concept and move forward in a timely manner.

The third theme, Emotional Experience of Teaching, represents my feelings that resulted from drawing on the board and engaging in discussion with students. The feelings largely resulted from enacting my Artist identity, as the excerpts that contained emotional reactions were from drawing on the board. Additionally, the experience of being back in the classroom reconnected me with my liberated self as I was able to fully reconnect with my students in person.

Summary Across Contexts

In summary, the working conditions and certain teacher attributes have direct relationships with each other. The way in which these attributes were affected by the working conditions evolves across the four contexts I studied. Here is an overall outline summary of the themes that emerged across all four contexts:

February 16, 2021: Remote Instruction 2020-21

Physical Presence/Awareness and Zoom Presence vs. Physical Presence:

- Tension arises from my inability to physically see students, impacting my ability to gauge students' comfort levels, engagement, and understanding. Zoom technology isolates and alienates each of us, hindering the ability to develop a culture of solidarity and shared experiences that are essential for Harkness instruction.

- The lack of physical presence leads to reliance on correctness over process, which impacted trust, autonomy, and student engagement. My struggles with time constraints and the need to fast-forward to correct answers diminishes the my connection to my teacher identity.

- My emotional experience of teaching consists of frustration with student reticence, frustration with technology, and the loss of aesthetic satisfaction from in-person teaching methods (e.g., writing on a board).

Time/Process Over Correctness:

- The tension between my Traditional teacher identity and my Harkness teacher identity is felt with respect to this theme. My need to cover the curriculum over a shorter time frame sacrificed the ability to promote the learning process, and affected student engagement and trust in the learning process.

Emotional Experience of Teaching:

- Feelings of frustration surfaced from student reluctance, technological challenges, and the loss of aesthetic satisfaction from writing on the board in my classroom.

- My overall disconnection from my Harkness teacher identity, resorting to more traditional, teacher-centric instruction due to the constraints of remote teaching.

February 23, 2021: Hybrid Instruction 2020-21

Harkness Teacher Identity vs. Traditional Teacher Identity:

- The tension between being a Harkness teacher and a traditional teacher surfaced in the struggle to maintain student engagement and foster independent learners in a hybrid instructional setting.

- My desire to prioritize the learning process over correctness reflects the inclination towards the Harkness method, which emphasizes student-led discussions and intellectual risk-taking.

- However, the constraints of the trimester schedule and the challenges posed by remote instruction lead to a prioritization of correctness and content delivery, reminiscent of traditional teaching methods.

Artist Identity:

- My artist identity emerges as a longing for tactile, physical classroom writing tools such as drawing on the board with markers.

- My frustration with technology-mediated instruction and the inability to engage in these artistic practices highlights the conflict between the working conditions of remote teaching and my identity as an artist.

Emotional Experience of Teaching:

- Emotional reactions to the teaching experience, including frustration, dissatisfaction, and longing, typifies the emotional toll of navigating multiple identities in the context of constricting working conditions.

December 14, 2021: Remote Instruction 2021-22

Technology Affordances/Constraints:

- My appreciation of certain affordances of technology for instruction, such as document highlighting and easy sharing of notes. However, the technological constraints, such as AirPlay malfunctions, are still a nuisance and interrupt the flow of class.

In-Person Presence Imprints on Zoom Presence:

- The established class dynamic from in-person instruction carries over to the remote setting, as students actively engage in discussions and help each other, despite my teacher-centric lesson plan.

Zoom Existence vs. Using Zoom:

- My perception of Zoom shifts from a state of existence to a tool for teaching specific skills, reflecting a proactive approach to remote instruction due to its temporary nature.

Emotional Experience of Teaching:

- Frustration continued due to technological challenges and I was not inhibited in expressing myself, which showed my ability to be more authentic in this context.

- Satisfaction arose from my sense of connection and mutual respect among students, fostered by our previous in-person classes.

January 20, 2022: In-Person Instruction 2021-22

Harkness Teacher Identity vs. Traditional Teacher Identity:

- The return to a more Harkness-based approach to teaching is evident, with a focus on process over correctness and student-mediated discussion.

- However, I acknowledge deviations from Harkness instruction are valuable, with some lessons being more teacher-centric due to external constraints such as the trimester schedule.

Artist Identity:

- The revival of satisfaction and relief through drawing on the board represents my reconnection with my artist identity.

- Drawing on the board serves as a lifeline for my artist identity, providing a sense of fulfillment and liberation from the constraints of technology-mediated teaching.

Emotional Experience of Teaching:

- The return to the classroom is liberating, allowing me to reconnect with my personal identity beyond the role of a math teacher.

- Drawing on the board with real ink was a real source of satisfaction and relief, contrasting with the anxiety and frustration experienced during technology-mediated instruction

The next chapter synthesizes the findings with respect to teacher identity. The definition of teacher identity that I chose for this study will be utilized to analyze my initial teacher identity before the pandemic, and the themes that emerged from the analysis will be brought incorporated, in order to examine how teacher identity was affected by the interruption of the changing working conditions from the Covid-19 pandemic.

CHAPTER 6: SYNTHESIS

In this synthesis chapter, I discuss how my teacher identity was affected by the working conditions of the Covid-19 pandemic and post-pandemic contexts. To do this, I first review my working definition of teacher identity and utilize it to reflect on my pre-Covid teacher identity prior to the start of this study. I also discuss the necessary changes made to my initial coding scheme and how codes related to my Harkness teacher identity and other identities related to each other. Then, I examine the relationship between the more complex themes from my findings and the tensions I experienced between my identities. Lastly, I share the differences between the kinds of themes from 2020-21 and from 2021-22 and how those differences relate to the relationship between the complexities and tensions.

Definition of Teacher Identity: Pre-, During, and Post Pandemic

To review, the definition of teacher identity that I adopted for this research project is an integration of the postmodern and the narrative conception of identity. *Identity* consists of a multitude of identities, accumulated from the historical trajectory of the experiences in one's life, and situated within one's current environment and social context (Bakhtin, 1981), and in part, an internalization of the world outside onto the world within (Vygotsky, 1978). A person's multitude of identities are indexed in the teacher identity, and are used in meaningful and relevant ways towards facilitating a teacher's beliefs into their practice, assuming that their beliefs correspond to their identities (Akkerman et al., 2011; Akkerman & Meijer, 2011; Alsup, 2006). Tension is experienced when one's teacher beliefs are incongruent with some aspect of the context, whether it is a new teaching pedagogy that one is being asked to implement, or perhaps institutional changes to the school. If the changes imply behaving in ways that run counter to one's beliefs or imply a having a belief system that differs in essential ways, then one

127

is going to feel tension in their teacher identity (Akkerman & Meijer, 2011). Upon reflection, this definition has allowed me to understand my teacher identity before I entered the pandemic.

I had already experienced a transformation in my teacher identity long before the pandemic. Adopting the Harkness teaching method over my traditional teaching practice required me to pull from my life experience outside of my math teaching. My other identities: philosopher, actress, researcher, and aspects of my artist self, were instrumental in providing me with schemas to help me facilitate the critical features of the Harkness method. These identities participated by providing ways of understanding how students can engage in interacting with mathematical concepts and in discussion with their peers. Integrating these identities towards a new Harkness math teacher identity showed me how to get students to talk about math with each other fearlessly, as if teaching math were no different than teaching *The Great Gatsby*. To that end, my Harkness teacher identity existed as the narrative that incorporated my identities.

The philosopher and the actress have always been their own separate identities that represent my various selves from different points across my lifespan; they seem to inform my identity in a supporting role kind of way. My artist identity, on the other hand, has always played a more leading role in my life and is present in most of what I do. This includes my daily math teaching. As I mentioned before, my artist self informs my Harkness teaching, but it is felt as an adjacent, separate identity from my teacher identity. This version of myself participates in daily in-class instruction as the draftsman of diagrams, as the composer of shapes on a rectangular plane, as the painter who makes her brush strokes with a marker-brush, and as the observer of beautiful drawings and writing on the board. I do not draw diagrams on the board just from the perspective of a math teacher who needs to visualize a concept; I draw them as an artist. On some level, drawing on the board is making art. These moments of drawing and writing on the

128

board were opportunities to make art at times in my life when I did not have any time to make art for myself. My Harkness teacher identity and my artist identity cohabitated relatively harmoniously within my overall identity.

In addition to the multitudinous identities that integrate one's personal beliefs into their teacher identity, the other critical component to teacher identity is *autonomy*, accessed by enacting one's agency in moments of vulnerability. Agency is the ability to adjust and rethink one's practices and beliefs in moments of vulnerability. *Vulnerability* is one's individuality in relation to unanticipated circumstances or lack of experience (Rodruiges et al, 2022). Additionally, the vulnerability that Keltcherman (2009) defined identifies social factors, working conditions, and the perception that the decisions that teachers make can always be up for critique and judgment. Thus, teacher identity is experienced as the possession of autonomy, in that the teacher can respond to unexpected changes in a way that is commensurate with their belief system.

The teacher identity that I had pre-pandemic was stable and well-situated within the physical classroom that I helped to arrange, furnish and decorate; the physical classroom, in turn, was situated within the school that allowed me to completely change my teaching style and curriculum all on my own. The vulnerability that I withstood pre-pandemic as a singular member of a then-traditional math department to change my teaching practice, consisted of carefully navigating the complaints from certain students and their families who preferred the transactional student-teacher relationship of the traditional teacher. I leaned into my agency and engaged families in conversation and reassured them that students were learning all of the curriculum of high school geometry and though they might feel uncomfortable with the student-centeredness, I, as a responsible math teacher, would never allow students to construct false ideas of the

concepts. I reassured students and families that as the facilitator of daily discussions, I would step in as necessary to correct confusion that could not get resolved in student discussions. This act of agency reinforced my teacher identity as a Harkness teacher. I successfully operated as an autonomous Harkness math teacher by the end of my first year practicing this method and for the following six years until the pandemic hit. The pandemic forced me into completely different working conditions that impacted my ability to access my teacher identity. Those working conditions, which did not make for a favorable environment for the Harkness method, put my teacher identity again in an extremely vulnerable position.

"Prerequisites"

When I proposed this dissertation, I knew that I wanted to analyze how my teacher identity, as a multitude of identities, was impacted by the dramatically changing working conditions across stages of the pandemic. I believed that I brought various identities to my teaching (e.g., philosopher, actress/theater performer, etc.), yet those were largely not the identities that arose when I analyzed my memos. It was my Harkness teacher identity, my Traditional teacher identity, and my Artist identity that emerged from my analysis. This meant that I needed to adjust my coding system. Rather than using "philosopher" and "actress/theater" as codes, I found myself identifying prerequisites for teaching in the Harkness method: *dispositions* (e.g., trust and belief in my students), *faculties* (e.g., my sensory experience that provided me with my awareness of my students), and *goals* (e.g., promoting an egalitarian culture, prioritizing a learning culture that emphasizes the learning process over mere correctness of answers). All of these 'prerequisites' must be present in the teacher in order to enact the Harkness method. I also identified the working conditions (e.g., Zoom presence, in-person presence, iPad use) that affected my ability to access and enact these prerequisites. As a

reminder, when I went back to the research, I found just one published study that examined the Harkness method. This study investigated the Harkness method in order to identify characteristics that facilitate intellectual risk-taking in the classroom (Souter and Clarke, 2023). This criteria was stated in Table 4. These criteria for facilitating intellectual risk-taking resonated with me, but I could not simply use the eight criteria Souter and Clarke (2023) indicate because they did not directly address these prerequisites (e.g., trust, awareness, and promoting learning process over correctness) that I noticed that I lacked while teaching through this pandemic experience. For instance, while one of the criteria states that teacher ego needs to be subordinated to support the egalitarian classroom, the criteria does not state the teacher dispositions necessary in order to subordinate one's ego. Because the research presented in this dissertation is about my personal experience navigating the working conditions in relation to my teacher identity, I needed to identify themes that addressed more fundamental elements of the teacher experience that make Harkness teaching possible. After several rounds of coding, I distilled several themes, the presence or absence of which make Harkness teaching possible (or not): Awareness, Trust/Belief, and Learning Process over Correctness. My Emotional Experience of Teaching was another theme, which addressed my satisfaction in the experience of each working condition. I also needed to address the working conditions, themselves, in my themes, as this research is about how the working conditions affected my teacher identity. Physical Presence, Zoom Presence, and Trimester each address the working conditions that changed over this period.

Interdependencies and Tensions

My coding process revealed that in order to enact my teaching practice, certain elements had to come together in certain interdependent ways. My definition of dependence is taken from

mathematics. In math, dependencies are specific relationships between points that, when organized in a certain order, create something new. With this concept of dependencies, a mathematician can build new mathematical objects just based on constructing specific relationships between individual points. A straight edge is used to define a line segment, and a compass is used to sweep out circles, which are the set of points that are all equally distant from that one point at the center. If one were to follow specific directions with just these two tools, things like perpendicular bisectors, equilateral triangles, regular pentagons, even regular heptadecagons (17-sided polygons) can actually be constructed on paper with a pencil. These shapes are made possible by dependencies. For instance, a line segment is dependent on two points. A line perpendicular to that segment is dependent on circles that are drawn by making each endpoint of the segment the center of each circle, and then identifying the points of intersection of the circles, and then drawing a line through those points. The line that is perpendicular to the segment is dependent on the intersection of the circles, and the circles are dependent on the endpoints of the segment. If someone wanted to draw a perpendicular line that bisects the segment, then those circles would be dependent on having the same radius, which would both be dependent on the length of the original segment. If these are done out of order, one could not guarantee that they would be able to make an actual perpendicular bisector.

Applying this to my coding, what I found was that Awareness is dependent on the working condition Physical Presence. My ability to enact my awareness was dependent on having all of us be physically present in the classroom. That struggle to access my awareness affected my ability to keep my students accountable in ways that were not teacher-centric. That affected my ability to meet my goal of the class: to promote a learning environment that emphasized the learning process over correctness. All of this, in turn, affected my ability to

access my Harkness teacher identity, which caused me to have to resort to telling students correct answers instead of using discussion moves to maintain student discussion. This, then caused me to feel the tension between trying to enact my Harkness identity while only being able to enact my Traditional teacher identity, which I did, begrudgingly.

To that end, what I found was that tensions that were experienced at the teacher identity level were caused by the breakdown of the dependent and interdependent relationships at the prerequisite level. Noticing that these prerequisite elements come together during the teaching process, all of the elements, as they come together, create a "teaching system"–like a living organism that needs a certain kind of environment to survive. When the system gets interrupted, like during the pandemic, tensions are felt in the struggle for a teacher to access their teacher identity.

To demonstrate how these tensions evolved over the course of the study, I will first list the themes from each context, and discuss them with respect to the two years. The themes that emerged can be characterized as dependent relationships between prerequisite elements. With the exception of the Emotional Experience of Teaching, which is the one common theme across all four contexts, which does not describe the working conditions or prerequisites, here are the themes from 2020-21:

February 16, 2021 themes:

- Physical Presence/Awareness
- Time/Process over Correctness
- Physical Presence and Time: Trust/Patience/Process over Correctness/Student Engagement
- Zoom Presence vs. Physical Presence

February 23, 2021 themes:

- Physical Presence/Awareness: Remote vs. In Person Tension

- Trimester/Independent Learners/Process over Correctness

- Zoom Presence Imprints on Physical Presence

All of the themes that emerged from the two contexts of 2020-21 involved relationships between working conditions and teacher faculties/goals. They emerged because these were the things that I was struggling with while I was teaching during this period. The lack of in-person presence affected my ability to see and hear individual students and also how they interacted amongst each other as a collective group of math students who were talking about problem solving. Additionally, the issue of time, a change in a working condition that was affected by the schedule, directly affected how the class was taught, as a content delivery system, rather than a learning process. Additionally, time affected students' ability to become independent learners and their own interest in the learning process. The combination of physical presence and time affected my trust in them, my ability to practice patience, my awareness, my ability to emphasize the learning process, and to maintain student engagement. These themes emerged because the interruption of the teaching system–the set of interdependent working conditions and teacher qualities resulted in my inability to provide the learning experience that I like to provide that is resultant of my teacher identity.

Conversely, the 2021-22 themes are distinctly different from 2020-21. Here are the themes from 2021-22:

December 14, 2021 themes:

- Technology Affordances/Constraints

- In-Person Presence Imprints on Zoom Presence

134

- Zoom Existence vs. Using Zoom

The January 20, 2022 themes:

- Process over Correctness

- Teacher-Mediated Student Discussion represents a composite of Harkness and Traditional teaching.

The themes that emerged from this year are characterized by observations about technology; how the dynamic of the remote class was affected by the previous two weeks of in-person class; by the observable difference between how the Zoom technology was experienced in this year compared to the year prior; by how the learning process was successfully encouraged and deep conversation was taking place; and by what appeared to be a reconciliation between my Traditional and Harkness teacher identities. None of the themes from 2021-22 represent the interdependencies of the prerequisite elements of the teaching system.

With all of this in mind, I found that I did internalize the working conditions of the pandemic which caused me to feel the tensions between my old teacher identity, the Traditional teacher identity–my "teaching how I was taught" identity, my Harkness teacher identity–my self-made identity, and my Artist identity–the identity that had been put to the side to prioritize the stability of my family. Thus, with the restrictions on my being, on my personhood, due to the working conditions of the pandemic, I experienced a splintering of my teacher identity. I had to prioritize Correctness over Process of Learning, and with this, the domino effect took place and a whole set of criteria of the Harkness method could not be enacted. (For example, because I could not see or hear my students, I could not keep them accountable in ways that did not recenter myself as a dominant identity, which broke down the notion of an egalitarian classroom. I could not promote student collegiality in listening to each other's differing perspectives because I

135

could not see or hear my students or construct an environment where everyone was holding each other accountable. See Tables 3 and 4). The trimester schedule that my school adopted forced me to speed through the curriculum, which might not have completely necessitated such emphasis of correctness over the learning process, though it made for an unfavorable starting point for cultivating a classroom of intellectual risk-takers because the impact of having to keep a pace meant that we did not have the same amount of time to meander in our math investigations.

The other working conditions–the Zoom instruction, the long periods of time in remote learning, the long vacations that broke up the trimester, the overall reluctance among students to engage in a participatory learning environment–all contributed to making my Harkness identity inaccessible. To that end, the Harkness method could not be facilitated without the main affordance of in-person instruction–primarily, being physically present in the same physical space. This shared physical presence affords me, the teacher, the ability to use my senses, or "practical sense" to gain an understanding of my students (Bourdieu, 1998; Christiensen & Nielsen's 2022). This was what I termed Awareness, and without in-person instruction, it was inaccessible. This awareness made me capable of knowing where my students were at in their understanding of each day's lesson, whether they understood the homework from the night before, and whether they were engaged and paying attention in class. Without this awareness, there was no foundation for my trust in my students or belief that they had the capacity to engage in intellectual discussion about the math concepts. Without trust and belief, it was impossible to enact several criteria from the Harkness method, such as subordinating my ego to promote student-centered discussion, or being able to effectively prioritize the learning and exploring process over the need to know correct answers. Emphasizing Correctness in the face of this lack of Awareness made it impossible to subjugate my ego for the sake of uplifting student agency.

136

As much as I tried to hold on to my Harkness teacher identity, the teaching system that is required to enact that teacher identity was broken. My attempts to incite student-centered discussion materialized into superficial student presentations from the strong students in the class that I usually interrupted, which was really nothing more than an elaborate performance of a teacher delivering content to her students, cloaked in Socratic dialogue form. This memo from February 23, 2021 encapsulates the experience of teaching this class and is representative of both working conditions; here the persistent use of technology continued to meddle with creating a community of learners in the in-person context and the duration of remote instruction had so deeply imprinted itself on the in-person classroom:

> The student is just standing there while I am talking. That is what each student is doing when I call them up to go over a problem. I feel like Paul Bamberg. It was just like Paul Bamberg's Real Analysis class. And I was excited just like he was and the student was standing there riding out their time standing in front of the class. Just like in that class. God, I hated that class. That class was the opposite of what I value in teaching. Similar to the way I run class, students had to present proofs. However, it was always clear to me that most of the people presenting had literally no idea what they were talking about. They were just reciting the proof. yeah--in that class, we didn't really have to present from problem sets where we applied theorems. We just presented the proofs of the theorems, which did not require us going through any kind of process of discovery. so in my class, we were doing both--proving theorems and sharing solutions to problems. and at this stage in the game, students would have had a lot more agency and capability to get through problems, had it been a normal year with a normal academic calendar/schedule. but with the way things went, even my strongest students were still struggling to get through problems on their own. and so I would interject in order to make sure we got through each problem and didn't make it be a painful experience for each presenter to be up in front of the class, visibly sharing their struggles. That is not uncommon for the beginning of the year in normal times in my normal class, but I used those experiences and leaned into them in order to get kids used to it and to develop solidarity and trust amongst the group. In this scenario, I didn't see us having the time for any of that. The room was not set up for it, the schedule was not set up for it, the interruptions made it hard, the social distancing and need for constant sterilization made it hard. even with many of us in the same classroom, each student was still existing within their own alienated realm. That is exactly like Paul Bamberg's class.

On the one hand, I was clinging to my Harkness teacher identity, as I was dragging students to the front of the room in order to participate in presenting solutions to homework problems. But,

137

with the directive to teach content in a trimester and with the continued use of Zoom technology, I had no choice but to revert to the default mode of traditional teaching.

While I did not remark directly on my philosopher and theater/actress identities in my memos, a broader view of my experience tells me that these identities played a more substantial role in my teacher identity during this time, despite the fact that they did not disentangle from my teacher identity with the change in working conditions. While I used elements of these identities to develop schemas to serve my Harkness teaching, such as improvisational free play to promote open and lighthearted discussion and philosophical discussion, in order to bring the feeling of math class closer to a humanities class, other aspects of the philosopher and actress identities are perhaps more congruent with the traditional teacher identity. The traditional teacher identity was the sage on the stage–the main character of the classroom. The traditional teacher identity did not have to subordinate her ego for the good of the Harkness environment, so my moments of interjecting wrong problem presentations in order to save time and move the class forward inadvertently provided me with an outlet to express my more theatrical, entertainer self. As problem solving is philosophical, the working conditions that forced me back up onto the stage also gave me the opportunity to continue to talk about problem solving in a philosophical way. The actual philosophical discussion, as discussion is an exchange between multiple people, in my class was gone, but my own philosophical thinking and explaining did not suddenly disappear with change in the working conditions. It is my perception of the role that these identities played with respect to the Traditional teacher identity, and their incongruence with the Harkness method that compelled me to judge it so negatively.

Within the greater narrative that is the career of Eileen Mooney, there are the identities: Traditional Teacher, Harkness Teacher, Artist, Actress, and Philosopher. Having made the

transformation from Traditional to Harkness does not mean that the Traditional teacher is no longer a part of my identity. What I have learned from this study is that to be the teacher that can teach in working conditions other than those that support my current teacher identity first implies understanding the temporality of the conditions within which I am operating. For instance, teaching remotely in the 2021-22 school year did not bring on an existential crisis like it did in 2020-21. This is because we had already established the class culture in my typical, original working conditions that supported my teacher identity, and I knew that we would be back in those conditions soon because I knew that the circumstances around this remote class were extremely temporary. To that end, I had no problem with identifying with the Traditional teacher that day in order to make the class a productive one. This is difficult to expect teachers to do when the duration is unknown and drawn out. It also requires understanding the affordances and constraints of the new working conditions. It requires reflecting on the conditions and the concepts that are supposed to be taught and asking how best to use those conditions in order to teach those concepts. This memo from the December 14, 2021 lesson encapsulates this phenomenon:

> Just so much more connected to these students. and finding it a lot easier to be on zoom when it is not the main way of knowing them. it's a lot easier to accept it in short term and maybe that's why I'm able to be openly in angst about the technology when it fails. It shows that maybe I wasn't as angsty as I actually was when I wasn't showing it so much. Trying to keep such a placid, pleasant disposition during the 2020-21 year was very much a representation of the "keep calm and carry on" attitude that we had to adopt at work pretty much all the time. By December/January of 2021-22, we knew we were on our way out and we were actively not social distancing, except for the masks. Having had the opportunity to develop a strong class dynamic before we had these zoom classes was critical to having students who actually ask questions and even answer each other's questions over zoom. But also knowing that it wasn't an indefinite state of being (being on zoom) meant that we could take it for what it was worth. I could use it to teach something really basic and algorithmic and not try to have student-driven conversations about math, which would inevitably fall short of my high expectations, anyhow. I could just have a live tutorial and students could just answer their simple questions. With such a

short duration of zoom, I could actually use the technology intentionally. and that put me in control.

If the end is unknown, a teacher might feel like they are compromising their sense of self/their belief system and might leave the profession. Hindsight being 20/20, maybe I could have just accepted the teacher-centric nature of this class. If I had done that, I could have played into the sage-on-the-stage role and perhaps I might have had an easier time accepting the quiet, receptive way that my students were engaging. Part of the problem with this thinking, though, is that I would have had to commit to being that person from the start of the term. Had I not just finished a term where I taught classes that were mostly in-person with only occasional remote classes, where I had more student participation and active learning in class, then maybe I would have given in to being a traditional teacher and had lowered my expectations for the sake of all of us. Because the second term's schedule had been changed soon before the term began, and because I knew that the second half of the term would be in person, I felt obligated to try to maintain higher standards for student engagement. My Harkness teacher identity looked ahead into the in-person phase of that class and knew that she would not have been able to live with herself if she did not try to facilitate daily student-centered discussions. Having not had any hybrid classes in the fall term, I could not have predicted the impact the technology would continue to have on the in-person environment. Had I known this, I would have been much more inclined to employ a teaching identity that was more congruent with the working conditions, thereby making a teaching system that would have been more effective.

CHAPTER 7: DISCUSSION, IMPLICATIONS & CONCLUSIONS

In this summative chapter, I aim to present four major ideas. First, I discuss the ways in which the current study contributes to the research literature on how the Covid-19 pandemic affected teacher identity. I will discuss the use of autoethnography and the prevalence of its use in understanding the teacher experience of the Covid-19 pandemic. Second, I outline this study's implications for research and practice. Third, I present the limitations/delimitations of this study. Finally, I will describe my research trajectory beyond this dissertation.

Contribution to Research on Teacher Identity and the Pandemic

I analyzed my saved videos in order to incite my recollection of my memory while teaching. Most of the studies I found were examining the experience of teaching during the pandemic's emergency remote teaching period (March-June 2020) only (Christiensen & Nielsen, 2022; Nazari and Sayri, 2023; Godber & Atkins, 2021; Liu & Yuan, 2021; Loo, 2023; Cambra-Faraci, 2022). My study differs from these in that my objective was to examine how my teacher identity was affected as I passed through four different working conditions throughout the phases of the pandemic.

The findings in three of these studies, however, aligned particularly well with my research. These studies each investigated the effects of the working conditions of remote teaching on teacher identity, and I explain each in detail below. The first qualitative study by Christiensen & Nielsen (2022) aligns with the awareness theme in my findings; the second qualitative study by Nazari and Sayri (2023) aligns with my observations that the different contexts in which teaching occurred surrounding the Covid-19 period called for different teacher identities, and the third autoethnography by Loo (2023) aligns with the teacher-centric performance of remote instruction that was evident in my findings.

The findings from Christiensen & Nielsen's (2022) study corroborate my claims about the awareness theme that emerged through my analysis in the present study. The awareness that I felt that I lost is in effect the "practical sense" that was hindered in both the remote and hybrid contexts of the 2020-21 school year. Teaching remotely and in the hybrid context made me realize just how much I relied on this practical sense/awareness to be a competent teacher. Without it, I could not keep my students accountable for their knowledge (e.g., noticing completed homework in their notebooks versus blank pages that they are filling in by copying solutions from the board, or being able to make eye contact with a student to let them know that I am checking on them). My awareness, or practical sense when engaged in student-led discussion allowed me to know whether students were paying attention; whether they did their homework was revealed in daily discussions, which were perceivable through my awareness. As I refused to let go of my Harkness teacher identity, and I stubbornly refused to adopt traditional teaching techniques, such as checking and collecting homework, because it undermined the development of trust in the Harkness classroom, I struggled to maintain student accountability, which directly affected my ability to trust and believe them. Similar to Christiensen & Nielsen's (2022) study, my inability to use my practical sense, or awareness, and my struggle to negotiate my teacher identity inadvertently caused me to undermine the trust that I was trying to develop.

Nazari and Sayri's (2023) research aligns with mine in two ways. Their identification of agency in the realization of teacher identity aligns with my definition of teacher identity. In online teaching, teachers struggled to use their agency to realize their ideas for their lessons. Second, the concept of transportable identities between two contexts allowed them to focus on the components of identity that are transportable with respect to the contexts, themselves, as providing more or less favorable conditions for enacting their teacher identities. In the same

regard, in the present study, I identified the remote context as an unfavorable environment for enacting my Harkness teacher identity as a whole, and felt frustration as a result of my lack of agency in facilitating student discussion. There were ways in which my identity was transportable, though they corresponded with my Traditional teacher identity more than my Harkness teacher identity. As teaching online pushed my instruction towards the "sage on the stage," I had at times utilized my actress/performer identity in my teaching. While this created tension inside of me, as a teacher who had worked so hard to subjugate my ego in order to enhance student-led discussion, the working conditions nevertheless required me to employ aspects of my identity that I do not usually use.

These findings were also in line with Loo's (2023) study, in terms of the tensions that he felt with respect to the performative characteristics of remote teaching. Namely, he found that over time, the act of teaching felt like a daily performance, particularly as students became more and more reticent. Similar to my having to resort to the traditional, "sage on the stage" teacher identity, the tensions that Loo felt as a result of the lack of engagement from his students resonated with my own. One difference, though, is that where his default teaching style was more teacher-centric, he ironically realized through his study how much he needs student engagement in his classroom, whereas my findings revealed my absence of awareness of my students and the dominance of my teacher ego. I identified my struggle with student engagement with my inability to access my awareness, or practical sense. This, in turn, is what pushed me towards traditional methods, and led me to the tensions I felt with my resurfacing teacher ego.

Thus, these three studies allowed me to situate my study within the current qualitative literature on teacher identity during the Covid-19 pandemic, and helped validate the credibility of my research findings. My study differed from the others in that I already had a well-defined

teacher identity that I had formally written about in my masters' thesis long before this project began. Because of this, I was able to utilize a theoretical definition of teacher identity that aligned with my identity, as I had already defined it. With a 'pre-Covid' identity and deep knowledge of how the working conditions before Covid integrated with that identity, I was able to identify how the working conditions during the Covid period (2020-2022) were affecting specific components of my Harkness identity, with respect to my deep understanding of the Harkness method.

Because I analyzed my teacher identity in light of the changing working conditions over multiple phases of the pandemic, my findings addressed more dimensions of the teaching experience compared to the other autoethnographies (Loo, 2023; Cambra-Faraci, 2022) and qualitative research (Christiensen & Nielsen (2022)) I found on this subject. On the one hand, this might be a limitation of my study, as I cannot explore each dimension of the teaching experience as deeply as I might if I was only exploring one time period. On the other hand, given that the study explores multiple phases of teaching during the pandemic years, under varied working conditions, and given that the Harkness method contains characteristics that are interdependent and rely on working conditions, it follows that this study would result in more dimensions of the phenomenon being addressed. My hope is that what is revealed in this study could provide a jumping off point for more research on the complexity of the interdependent relationships between the myriad prerequisite elements of working conditions and teacher aspects within teaching.

Implications for Research and Practice

An autoethnographic approach to understanding teacher identity. As mentioned above, several teacher-scholars like me have chosen an autoethnographic approach to exploring

teacher identity in the context of the Covid-19 pandemic (Godber and Atkins, 2021; Liu and Yuan, 2021; Loo, 2023; Cambra-Faraci, 2022). Perhaps the prevalence of autoethnographic studies on understanding teaching during the pandemic occurred because of limitations on the conduct of human subjects research during that period. In any case, these contributions to the literature on teacher identity provide insight into the phenomenon of teaching informed by theories that have largely been explored from an outsider's perspective, that is, from researchers who are not simultaneously experiencing the phenomenon of interest. My dissertation provides yet another example for how autoethnography can be utilized by more researchers in educational psychology and educational technology. The accumulation of autoethnographies allows us to use these first-hand investigations as a collection–as a body of research with which new knowledge can be constructed that is of a different form–first hand analyses of the common experience of teaching during the pandemic.

Future research that employs an autoethnographic approach to understanding teacher identity might include the teacher identities of online teachers. For instance, one might ask, how do the working conditions of online teaching affect a teacher's online teacher identity? Or, how do teachers achieve community and connectedness in their classes in online learning environments? Autoethnographic research could be incredibly helpful in understanding how discovery-oriented, student-centric online learning environments can be successfully constructed, and what about their teacher identities makes them uniquely prepared to build such learning environments. An insider's perspective on these questions could be immensely valuable in providing insight into a phenomenon that is both ill understood and increasingly needed.

I hope that this research demonstrates the effectiveness of autoethnography as an empirical research method for investigating teachers' nuanced experiences in their practice.

145

Autoethnography seeks to create an archival representation of a particular cultural phenomenon from an insider's perspective by incorporating enactment of memory, thick description of experience, theory, and a foundation in the literature surrounding the topic of interest. Thus, autoethnography should be perceived as a highly situated form of research that, like other forms of research, inspires more research, both qualitative and quantitative. Insights can be gained from utilizing the insider's perspective in all categories of educational research when the researcher is investigating a topic that is meaningful to the discipline and when the research is transparently reported (Hughs et al., 2012). Thus, my personal experience negotiating my identities through such turbulent times should inform the research on teacher identity, teacher decision making, and intentional utilization of technology in the classroom, to name just a few. Furthermore, I hope this study serves as a response to Lampert's (2000) suggestion to incorporate more practitioner research into the field of research on teaching.

Integrating new teaching practices into one's teacher identity. How a teacher adopts a particular pedagogy, like the Harkness method, is personal. There is no research on how teachers adopt Harkness instruction, though there are multitudes of research on how teacher identity changes with professional development on more student-centered practices (Heyd-Metzuyanim, 2019; Arvaja & Sarja 2019). While that research is varied, all of it suggests that a teacher's personal beliefs must index themselves into the pedagogies that they are trying to adopt. A pedagogy that a teacher is adopting must have aspects of it that correspond to a teacher's particular beliefs. If it does not, then it is not likely that the teacher will be able to incorporate it into their practice (Beijaard et al., 2004; Van Veen & Sleegers, 2009; Bronkhorst et al., 2014). For me, as I shared in the Pre-Covid Chapter, I made a personal and deliberate decision to change my teaching practice, which shared connections with other deliberate changes I made in

146

my personal life (e.g., finding my voice in my marriage, divorce, remarriage). My own personal professional development arose from reflecting on my other identities–my other ways of being– and utilizing those schemas in order to construct my Harkness identity. Ultimately, how other teachers adopt the Harkness method, or any other teaching method, is up to how they integrate their beliefs and ways of being into their new practices in order to create a new teacher identity, as the teacher identity does not exist as a separate entity from the rest of a teacher's self (Akkerman & Meijer, 2011). Thus, more research on how teachers successfully implement professional development needs to be done. For instance, how might professional development and training be restructured to include ways to scaffold experienced teachers reflecting on their identities and beliefs as a way to incorporate new pedagogies? Exploratory studies of the phenomenon could ask, what are the characteristics of teachers who have successfully adapted to new pedagogies and how can their experience inform us about teacher identity? Answering these questions would help us understand how teachers can adapt to new pedagogies when teacher belief and teacher identity are prioritized.

In addition, my autoethnographic study has practical implications. First, practicing high school teachers reading this study can perhaps derive insights about why teaching during the pandemic was so difficult. For many of us teachers, it amounted to an existential crisis, causing us to deeply question life's meaning and purpose, leading to a profound re-examination of our teacher identity, values, and the essence of what it means to educate. Second, it might not be that many teachers think about their actual teacher identity. Perhaps teachers who read this study might consider their teacher identities more, and consider where their beliefs come from and why they hold on to them. Perhaps they might consider how their teacher identities make them a more or less adaptable teacher with respect to changes imposed on them. Perhaps they might begin to

147

understand why teaching is so hard and how the working conditions affect their practice. Perhaps they might consider how they might be innovative in their own practices by reflecting more on their belief systems in general.

Moreover, we know that new teachers report feelings of being in a survival mode (Zhukova, 2018) - not unlike teaching during a pandemic - and trying to "sink or swim" on their own (Ingersoll, 2012). Many end up leaving the profession with regret, still committed to students but unable to continue (Dunn, 2018). Teacher departures have high costs to districts, schools, and students (Carver-Thomas & Darling-Hammond, 2017). Therefore, this autoethnography may provide useful insights to new teachers who made it through the 2020-2022 pandemic context and are trying to make sense of the pandemic's impact on their beliefs about the profession and their sense of who they want to be professionally. Further research in this vein might ask, what kind of professional development for administrators could be constructed to help them understand the complexity and interdependency of teacher identity with respect to attrition and burnout? Or, what are the ways in which administrators and faculty work together effectively, and how could we use that research to help support teacher autonomy? Research in this vein could help administrators to understand how to not just support and retain teachers in their schools, but to keep them in the profession.

My hope is that this study will contribute valuable insight into the construction of teacher identity, with respect to the nuanced and complicated experience of teaching amidst change. As I have already stated, I find myself in an unusual position in that I have data on my teacher identity and data on my teaching experience throughout various stages of the pandemic. To this end, the insider perspective that I provide from engaging in this autoethnography could potentially help to sharpen the focus on teacher identity in order to inform the evolving work on

preservice teachers' identity development during their teacher education programs, for informing how professional development is structured and designed to better the fidelity of implementation of new teaching practices, to address the disconnect between how administrators perceive the teacher experience and how teachers' actually experience teaching, and to potentially elaborate on the findings that research has already found about teacher identity.

I hope that with this research, new questions about the teaching experience and teacher identity might arise. For instance, I expect my data will reveal that my teacher identity was not stable through all of the changes during the pandemic. If this is the case, it should become more clear from this research that teaching is not just about delivering content to students. The teaching environment, which includes both the working conditions and the social context, are embedded in the teaching experience, and therefore are integrated into the identities that make up teacher identity. So then, what does that leave one to wonder about how identities participate in forming the learning environment, or how the environment responds to and informs identities?

Limitations/Delimitations

My main objective of this study was to provide an insider's perspective on the construction of teacher identity and the tensions felt within teacher identity with respect to social context and working conditions. In so doing, I have shared an analysis of my teacher identity as I transitioned through the various stages of the pandemic, characterized largely by levels of social distancing and working conditions. I interpreted my teacher identity as a dialogic between multiple and singular identities, between social and personal identities, and between identity as discontinuous and continuous (Akkerman & Meijer, 2011; Bahktin, 1981). I interpreted my feelings about my identity within the context of the profession of teaching–which is an

intrinsically vulnerable position, and dependent on factors that are not within a teacher's control (Keltchermans, 2009).

I strived to achieve credibility with respect to explaining and constructing my teacher identity not just through recall, but by reading and reflecting on extensive writing that I did (Saldana, 2021; Hong et al, 2012), where I constructed my teacher identity through metaphorical devices (Lakoff & Johnson, 1984). I explained in great detail how I developed and constructed my teacher identity in Chapter 4. Additionally, as Hughes et al. (2012) stated, the relevance of the inquiry with respect to the detail of the data collection and analysis strengthen the credibility of the research. Utilizing video in order to facilitate recall of my experience strengthens the trustworthiness of my account of my experience.

Reflexivity, defined as the awareness of my positionality and transparency of my biases as I analyze my data, was utilized as a tool to address my positionality as I analyzed my memos. I was the only researcher reflecting on and analyzing myself as I carried out my lessons, navigated and responded to the technology, and engaged with my students, and thus I lacked the ability to triangulate perspectives on my instruction. However, as Hughes et al. (2012) emphasizes, I committed to transparency in sharing my decisions as I reflexively discussed my analysis in the Findings and Synthesis chapters. Also, I intentionally selected videos to analyze across several months. I did not leave it to random selection or other positivist devices to ensure validity in my sampling selection and my decisions to include or exclude certain video were discussed in relation to the research question (Hong et al., 2012; Adams et al., 2015).

The experience of watching and rewatching videos and reading and rereading my memos from a difficult time in my life was very difficult, and I without a doubt re-lived traumas through this analysis. It was difficult to separate this experience of reliving events from the pandemic

150

with my current work, and to prevent myself from allowing more recent events to color my memory of the past. I needed to take breaks and give myself space from this analysis and approach it intermittently. Being an autoethnographic study provides me with the opportunity to write *through* those traumas, and use narrative about those traumas as data, in order to deepen the verisimilitude of the study and provide insights about the teacher experience. My hope is that my narrative and the reflexivity that I provide in my analysis provides the verisimilitude in order for other teachers to view my experience as relatable (Hughes et al., 2012; Ellis et al., 2011).

All research methodologies are double-edged swords. For autoethnography, the power of being the insider is being able to share the experience of a phenomenon from the inside. However, my intimate relationship with the data likely prohibited me from having certain insights that an outside researcher might have had. Though the research I shared in the Discussion corroborated my findings, this does not mean that I noticed everything. Being as entrenched as I was in analyzing my own experience might have made me too nearsighted, making it harder for me to notice what someone with more distance might have seen more clearly. This may have limited the potential additional insights that this study might have provided.

One of the challenges of writing autoethnography is toggling between autobiographical and ethnographic writing. Balancing between transparency in my analysis, while also writing an illustrative document that elicits affinity in the reader, is what makes this dissertation a historical cultural artifact (Adams et al., 2015). Being transparent about how I confronted and addressed these challenges and biases as I dovetailed analysis with evocative writing hopefully contributed to its credibility (Hong et al., 2012).

I selected the theories that I will be operationalizing in this study because they best describe the teacher identity that I constructed for myself. That is, I had a conception of what my teacher identity was, which consisted of a multitude of identities, and while these identities were in constant negotiation, my teacher identity overall was relatively stable up until the pandemic. I chose a theory of identity (Bahktin, 1981) that I could operationalize in order to explain and analyze the manner in which my identity was affected by the pandemic. The other theory that I am utilizing allows me to relate teacher identity to the pandemic itself. I characterize the pandemic as unstable working conditions and social context, thereby utilizing Ketchermans' (2009) theory of teacher identity. Vulnerability is essential to teaching–thus, the teacher identity and its negotiations between its disparate identities are always responding to fluctuations within the environment as a continuous negotiation of identities. This allows me to operationalize a theory that pertains to teacher identity in relation to the inherent vulnerability of the teaching profession (Keltchermans, 2009). There might be other theories that relate teacher identity and stability of environment in a single theory, or they might assume other conditions. Matching theories to occurrences that already took place, from a positivist perspective, may seem to be a threat to the validity of the study. However, this is not an experiment–it is an autoethnography, where details of a particular phenomenon are being shown and explained. Thus, as I rely on Hughes et al. (2012) to ensure that this study is warranted, I maintain that theory functions in this study in order to translate my experience of navigating the negotiations in my teacher identity through a tumultuous time in history, in order to understand teacher identity in general within the scope of educational research. Therefore, I am framing my personal experience as a teacher within educational research in order to provide an analysis of a phenomenon that is very difficult to access from the outside–teacher identity.

My concept of my own teacher identity is unique in that most teachers do not likely spend time constructing their identity, or vision of their classroom, in writing so intentionally. The writing that I did in 2015-16 was instrumental in how I conducted myself as a teacher over the last several years, and how I have assessed my satisfaction thereafter, which involved various iterations of curriculum and schedule change at my school. In some ways, I have been assessing the integrity of my teacher identity in relation to change on a smaller scale for several years informally. My previous experience affords me an ability to examine the dimensions of my teacher identity with respect to the drastic changes that occurred during the pandemic.

My Research Trajectory

This research has not transformed my thinking about what it means to be a teacher, but it has provided me with a new, much more explicit language to understand the phenomenon of teaching. While I always knew that teaching is difficult and that there are many factors that are involved in teaching well, this new language has provided me with more clarity on the complexity of teaching and teacher identity. I see much more clearly how expectations on teachers and their working conditions don't just affect their ability to do their jobs well, they impact their teacher identities and their ability to cultivate their teacher identities. Teachers must be incredibly adaptable in order to stay in the profession, especially with expectations that are often in flux. I see myself continuing research like this. I would like to conduct more autoethnographic studies on teacher identity and in the teaching profession. I currently teach math, studio art, and a senior capstone research course. What of my teacher identity is transportable between disciplines? How does having a course load of courses from multiple disciplines affect my teacher identity? Now that I teach art, will my need to engage in my white board drawings in my math classes change? How does awareness, or practical sense, change

across disciplines? Are there different kinds of awareness that are necessary for different disciplines? Being a teacher-researcher of different disciplines and employing autoethnographic methods, I could use my current teaching practice to provide that insight.

I still feel the same way about educational research as I did at the start of this study. More teacher-research is needed in this field, and it needs more support. Particularly in the fields of educational psychology and educational technology, where more research is quantitative in nature, the insider's perspective on implementing the tool while being the teacher provides insight that being the outsider cannot see. I would like to continue this work, though affiliation with a university while being an employed high school teacher might be difficult. This is the bridge that must be built between research and practice, and with my new skills, inspiration and passion for inquiry, I will do my best to find a way to do it.

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