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An Auto-Ethnographical View of the Growth in a Pre-Service Teacher

A Capstone Project Submitted in Partial Fulfillment of the
Requirements of the Renée Crown University Honors Program at
Syracuse University

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and Renée Crown University Honors
Spring 2019

Honors Capstone Project in Inclusive Elementary and Special Education

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Abstract

This thesis is an auto-ethnography that examines how field experiences in diverse classrooms can grow and deepen a pre-service teacher's understanding of complex pedagogical ideas. It examines how experiences changed the subject's view on the role of classroom culture in classroom management, and how the intersection of those two important aspects of teaching can increase positive classroom space. Also examined are the similarities and differences between hands-on learning and inquiry-based learning, as well as how using those together results in greater understanding, deeper comprehension, and a higher level of enjoyment in the students. Lastly, this auto-ethnography shows how interacting with students on many different levels can increase one's understanding of students and of the relationships between students, their peers, and their teachers. The purpose of this reflective auto-ethnography is to show how a teacher preparation program can enhance and deepen the understanding of a pre-service teacher, as well as to explore the different facets of important pedagogical ideas.

Executive Summary

This thesis is an ethnography that started approximately 2.5 years ago, in the fall of 2016. Over these 2.5 years, I, the subject, have had diverse placements in six different schools and four districts, covering every grade from first to sixth. I have worked with children from a wide range of levels of academic content abilities, disabilities labels, cultural, lingual, and ethnic backgrounds, and socio-economic statuses. Over these many placements, I have learned that yes, of course, content is important, but it is not the only thing we as teachers have be confident and skilled in. The pedagogical aspect of teaching is important as well. Pedagogy is *how* the content is taught and how the classroom is run and managed, and is in concert with the content curriculum and school and district regulations. The main pedagogical aspects that I focused on for this ethnography are the intersection of classroom management and classroom, as well as the differences and similarities between hands-on and inquiry-based learning. This ethnography explores my changing ideas, knowledge, and understanding about these topics across my experiences with my students and host teachers.

This is an auto-ethnography, which means that I, who am the subject, am also writing it. I have taken great pains to make sure that it is as accurate and unbiased as possible, as I want it to seriously reflect what has happened in my placements and what I have learned. In order to do this, I have employed many others to read and edit, as well as using lesson plans, writings, and reflections from the past three years as a basis for the conclusions I draw and the beliefs I expressed.

In terms of my two pedagogical research foci, I have come to similar conclusions on both of them. When I began my teacher preparation program, I was not necessarily wrong about any of the themes or ideas, I just had an incomplete and simple picture of something much larger and

more complicated. I have learned that classroom community is an incredibly important aspect of the classroom. A positive classroom community can make the job of managing the classroom so much easier for the teacher and the students, and increase everyone's comfort in and enjoyment of the classroom. In terms of inquiry-based and hands-on learning, I learned that these are far from the same thing. In fact, they are entirely different pedagogical approaches to subjects in the classroom, but can complement each other and often be even more effective when applied or used together in a lesson or unit. They can both also be quite difficult to implement, but are highly beneficial since students show a higher level of academic success, understanding, and performance.

Overall, I have learned through this project that my ideas are constantly changing and growing, as is my understanding, and that that is not a bad thing. I have accepted that at the beginning of my three years, when I thought I knew a lot, I actually understood very little. My conceptualization of what it means to be a teacher has become much deeper and more complex. I now understand that is not one best way to do anything, and that every teacher is going to make choices based on what works best for them, and that might even change between years and groups of students. Continual learning is essential for all teachers, especially new ones, and learning that it is not only acceptable to continue to question and learn, but actually a good thing. To admit that you do not necessarily know what is best in a situation is a strength, for you are showing you want to be better and stronger.

Table of Contents

Abstract	iii
Executive Summary	iv
Acknowledgements	vii
Advice to Future Honors Students	viii
Chapter 1: Introduction	1
Chapter 2: Classroom Management and Classroom Community	4
Chapter 3: Inquiry-based and Hands-on Learning.....	11
Chapter 4: Conclusions	18
Works Cited	20
Appendices	21
A – 3-Act Task Math Planning Commentary and Reflection	22
B – Mental Math Planning Commentary and Reflection	24
C – Social Studies Behavioral Expectations and Lesson Reflection	25
D – Parent’s Night Reflection	26
E – Student Teaching Activity Log Weeks 3 and 7	27
F – Assessment Analysis of Tutoring Pre and Post Assessment	29
G – Comprehension Lesson Planning and Reflection	30
H – Science Unit Commentary Reflection	32
I – Math Lesson and Unit Commentary and Reflection	35
J – Math Small Group Lesson	36
K – Science Synthesis Paper	37

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None of this would have been possible without you.

Oh! And also, I would like to thank Butters Hall for just being awesome.

“The best teachers are those who show you where to look, but do not tell you what to see.”

- *Alexandra Trenfor*

Advice to Future Honors Students

In this section, every honors student writes about how they wish they had started earlier. Well, they are not wrong. You should. But I think there are a few things more important than that that I want to impart in this section. The first is that you have to *enjoy* your topic. If you do not like your topic or enjoy doing your research, then do not do it. If you would rather go to a boring lecture than write your thesis, change your topic! Pick something that you are going to *want* to learn about and write about for the next year. Then, for yourself, focus on the research and the experience. That is what you are going to get out of this the most - the experience and the hands-on nature of whatever you are doing. Yes, the writing is important, but that is important so that other people can try to experience and understand what *you* did. So, focus on what you are *doing*. My last piece of advice is to trust your advisor and your coordinator. They know what they are doing. Those dates when things are due are not just made magically out of thin air, and making you go to meetings and submit drafts is not sadism. It really does help, and trusting them that they know what is best and know what you will or will not be able to do is important.

My last piece of advice is for School of Education students in honors only:

DO THE ETHNOGRAPHY. I repeat: **DO THE ETHNOGRAPHY!!!** I thought that it was too boring and simple and I decided it would be a much better idea to do some crazy project with independent research and topic that I was interested in but that I did not know much about, and to try to do it while I was student teaching and doing Block 3. Crazily enough, that did not work out so much and I ended up dropping honors. It was only when I realized that I could do the ethnography and that it was doable after I finished student teaching that I came back. I was able to complete the ethnography and enjoy doing it, as well as not being stressed about doing even more research while I was teaching essentially full time. So, as I said above, trust your honors coordinator when they say to do the ethnography. They really do know what they are talking about and know what you will be able to manage.

Chapter 1

Introduction

Whenever someone conducts a study on a group of people, that group changes over time. The same is true of studying one single person. Any kind of study such as this is called an ethnography, which is simply a study of a group of people by a researcher over time. A step different from that is an auto-ethnography, in which the researcher and the subject are the same person, as in the case of an autobiography (Ellis, Adams, & Bochner, 2011). This has been the type of research I have conducted over the past three years: studying the changes in myself, as a professional, as a teacher, and as a student. I have had many placements to draw from during my time in Syracuse's University School of Education teacher preparation program. Through these, I was able to learn and grow throughout each semester as I continued toward becoming a certified teacher.

Beginning in my sophomore year at Syracuse University, I was placed in a classroom, called in our program being in 'the field'. My major was, and still is, inclusive elementary and special education. This prepares me to receive an initial certification in both general elementary education (grade 1-6), and an initial certification in special education (grade 1-6). Syracuse prides itself on getting us in the field right away, in as many diverse and inclusive field placements as possible, experiencing both urban and suburban classrooms, high-and-low needs districts, special education and general education, and a wide range of grades and ages.

This first field placement, called Block 1, was three mornings a week for seven weeks, working primarily on community building and early literacy skills. I was lucky enough to be in a first grade classroom in a suburban school classroom, which was an engaging and informative

placement. Second semester that same year I was thrown into even deeper water, in Block 2. This time I was in an urban second grade classroom, spending four full days a week for six weeks working with my host teacher and her students. This block was primarily focused on teaching students that were all having various levels of success with the grade level curriculum, and therefore needed different levels of support. It involved differentiating the pedagogy for them within math, English Language Arts (ELA), and social studies instruction.

Due to some special circumstances, I ended up having the opportunity to do a second Block 2 placement, this time in an inclusive suburban second grade. This was truly an opportunity, as I have not had a placement quite like this one, and the experience with that host teacher and supervisor is one I will treasure. I was in this classroom three days per week for almost the entire semester, co-teaching math and ELA, and even had a leadership role in the planning and execution of the Social Studies Unit the students were doing. The second half of the year, which was Block 3, was very different, and challenging in a different way. It was focused on hands-on, inquiry-based instruction in math, ELA, and science in an urban, very high needs, 4th grade classroom. This placement was six weeks long, and we spent two weeks exclusively teaching each of the three subjects.

My last placements were student teaching, in which I was essentially a full-time teacher for the semester, as well as still learning in my role. For my program, we student teach twice in the semester, one in special education and one in general education. These are both eight weeks long, often culminating in a solo week, or a week of the student teacher (me) teaching and planning as the host teacher does. For my special education student teaching, I had the opportunity to be in a resource room for 4th-6th graders in a suburban district, working with between 12 and 15 students (it varied throughout the eight weeks). My general education

placement was also something new for me, this time in a dual language academy in 3rd grade. My classroom was a general education classroom which was instructed fully in English. The school that we were in, however, was a dual language academy, in which some classrooms and many of the students were bilingual. Many students spoke Spanish as their first or second language, and all school bulletins, materials, and notices were in both languages. Both of these experiences were tiring and overwhelming, but the amount of knowledge and understanding I gained from them is unparalleled. I move into (hopefully) full time teaching next fall with all the knowledge these placements have given me, especially these last two student teachings.

Through all of this research and experience, I have taught in many different classrooms, with many different teachers, and in many school districts, and have learned much about content, pedagogy, content pedagogy, the complicated politics of a school, and what it means to teach young minds. Within all of this, the biggest change for me has been my understanding of the non-content aspects of teaching. During three years in six schools, I have seen myself, through lesson planning, critical reflection, writing, and observations of other professionals, grow, refine, and redefine the elements of my teaching most important to me. Those have included the uses of Universal Design for Learning, the intersection of classroom management and classroom community, and the true importance of inquiry-based learning in all core subjects that I teach.

Chapter 2

Classroom Management and Classroom Community

And the Intersection of Those and Support They Provide Each Other

Every teacher has to manage their classroom and their students. However, this takes many forms. In some classrooms, management is a strict set of rules laid down by the teacher with severe consequences, while in others it is a more relaxed sense of respect and mutual understanding. In many classrooms, management includes a system such as a color chart, dojo points, or other established behavioral system. Dojo points are a system in which a teacher gives or takes away points from students from following or breaking the class rules or expectations. One can argue all day about the validity and uses of these systems, and there is mixed evidence of what works for students and their learning. For example, one study found that online points systems such as Class Dojo actually increased student performance and enjoyment (Ryan, Hew, & Cheng, 2018), while another found that it only serves as a way for students to compare each other and disciplining students (Jarke & Breiter, 2019). I strongly believe that students learn best when they are not worried about earning points and beating their peers. When they are not concerned about the punishment they face or how they measure up to their peers, every student can focus on being their own best and trying their hardest. This then means that they feel better about their own ability and successes rather than comparing them to everyone else's. This overall increases the positive community in the classroom and the overall happiness and security of the students.

Every classroom also has a climate, or culture, though it sometimes may be more obvious than others. In some classrooms, the culture is that of dominance: the teacher is in charge, the

students listen and learn. An example of this is dojo points, in which the teacher has the full ability to determine when and who gets or loses points. The teacher is completely in control of the students and is dominating the rules and consequences. In others, the climate is more community based, with all members being equal learning participants. I have found that the relationships between students and their teacher and each other often determine the students' ability to learn productively in a classroom, their potential, motivation, and comprehension. What I have learned about these two ideas is that they are not so different, the decisions a teacher makes about community culture affects their management, and the management system of a classroom is derived from, and based on, the culture created.

When I first began my program, I knew that a classroom was a community of sorts, and that management of that community was required of these things were. I had experience with different teachers and their classrooms, and understood that different teachers do things differently. You can act a certain way in one of these areas and not in another, one teacher you can joke around with and know as a person outside of the classroom, while another is just your teacher. But I defined these two ideas completely separately. I saw management as strictly the set of rules and expectations in the classroom, and the consequences and rewards based on those expectations. I knew that they could be created by the teacher or by the students, and could be strict or lenient, but I saw management strictly defined by those terms. Classroom culture was, to me, something extra, like getting computer time when you finished math. I saw classroom culture as community builders, fun games, icebreakers and other things to get to know each other better. In my early understanding, I had these two ideas completely detached.

Then, I had my Block 2 experience in an urban 2nd grade classroom. In this classroom, I observed my teacher heavily, being there 4 days a week for 7 weeks. I learned about her, her

classroom, and the management structures she had in place. I saw that, using things like morning meetings and movement breaks, she attempted to form a community with her students of trust, respect, and fun. The students would do choral counting together and jump and move around, have indoor recess as a group, and do other fun things. But I also knew that in this classroom there were very strict rules and expectations, some of which were stated and some of which were implied. Some of these rules involved strict bathroom policy, not talking during independent work, not sharing work, and keeping spaces clean. When students were not able to follow these rules or expectations, there were strict consequences. This involved taking away recess, lunch detentions, calling students out in front of their peers, and separating their seats. I also observed inconsistent consequences and punishments. Two students who had both been doing different things at different points of the day would receive different consequences, and some might not receive any. Though I am sure there was reasoning behind her decisions of these consequences or lack thereof, it was difficult for me to understand. I was not always sure if consequences would be given and what they might be, or how strict she would be at that point. I believe that the students were often just as confused. Also, the students, I saw, then had trouble sharing their ideas with their peers during any sort of group work because they had almost no experience with it, as I saw during a 3-Act Task (Appendix A) and a Mental Math Lesson that I lead (Appendix B).

I saw these two mindsets of the teacher, attempting to have fun with her students and bond with them, while simultaneously giving out strict but uneven consequences, were often in conflict with each other. Students would believe that it was a time to have fun and build their community, and would be punished or rebuked for acting that way. Other times, the students would be being quiet and respectful and the teacher would ask why they were not having fun!

The students could not figure out which it was time for, and subsequently would be punished for behaving or acting the wrong way. I began to understand that the teacher, in doing both of these, was confusing her students and blurring their understandings of the relationships that existed. I began to change my understanding, seeing that the management a teacher uses and the culture of the classroom that they work to create cannot be separate. I saw a teacher who tried, and failed, to do so. When the community and management were such opposites, and since she had gone about those so differently, it did not work for her or for the students. They did not know what to expect or their place in the classroom, and the teacher did not have a positive community in the classroom to build off of when students did not act appropriately. To remedy this somewhat, I made the behavioral expectations in my lessons that I lead very clear from the beginning. In one social studies lesson, we made a chart of behavioral expectations before hand, and I used that to remind them what I expected throughout the lesson. I kept my expectations clear and my consequences consistent (Appendix C). This seemed to help students, as they knew what I expected from them and did not face unexpected consequences or punishment.

Using this experience, I redefined my understanding of these two concepts. I began to see that management is both a system of expectations and consequences, as well as the teacher's outlook and presence in the classroom. I also learned that culture and community in a classroom are important, and that a positive and trusting community makes a coordinated management system much easier for a teacher to enforce and students to follow. This idea of classroom culture and community are not just parts of teaching or parts of the day where you do fun things with students, but a heavily integrated part of the everyday pedagogy of teaching. The culture of a classroom is ever present, and so having that culture be productive and positive can work wonders. It allows everyone to feel safer in and invited into that community, which in turn helps

students to be more ready to learn and more able to focus on their instruction instead of focusing on how they are or are not being included.

With these new and improved ideas around classroom management and culture, I began my second Block 2 placement in a suburban inclusive second grade. In this classroom, I experienced a very different teacher than I had before. I saw that the culture she created and the management system she used were one and the same. Her students had helped her come up with the rules and expectations, and everyone knew what was expected of them. I also saw that the rules and rewards were consistent across time periods, students, and subjects. There were consequences when students did not do what expected of them, but they were also reasonable to what was happening. The consequences never involved public shaming or calling students out, but rather having students change their actions positively for next time. The students also trusted their teacher about those expectations and her care about them, as well as her obvious interest and investment in their learning. She showed this to their parents as well during the parent night at school (Appendix D), and stayed consistent in what she told the parents and students to expect from her and the classroom.

I saw something very similar to this in my second student teaching placement as well, this time in an urban third grade. This teacher specifically also made one-on-one connections with the students. Within the content requirements of the school's ELA program, the teacher specifically checked in with each student every day. These check-ins were about how the students were doing academically, but also how they were functioning in the classroom. The check-in could involve a review of the expectations she had for that student, as well as how that student was performing non-academically in the classroom. For example, one of our students was struggling to work with others in class on her research assignment, as well as working on her

reading goal of finding specific details in text. The conference between my host teacher and the student was an opportunity for them to talk about both of these. She told him that she saw he was trying to find details, but that often he would shout them at his group or interrupt them. Together, they were able to come up with a plan in which the student still worked on finding key details from text, but also on how to share those details she found with his peers. She and the teacher worked on both non-academic and academic goals during these meetings, both of which related to her performance and comfort in the classroom.

This allowed the teacher and the students to feel comfortable and knowledgeable about the classroom, as well as keep up to date with each other and what they each needed. These one-on-one personal connections really contributed to how the classroom ran from a management perspective, as well as how comfortable the students felt in the community that was their classroom. The teacher also always made sure that she stayed on top of these conferences, and would cancel other activities or pull students from their morning work in order to make sure they go their meetings (Appendix E). While I did not sit in on a lot of these meetings, I know from informal conversations with students that they enjoyed talking with the teacher as well as getting to update her on their progress. This allowed them to learn better, and feel more comfortable to be themselves and their own kind of learner.

This opened my eyes even more to the possibilities of what a positive and productive classroom community could lead to. This classroom community model in which the management is based on the community formed between and with the students and the teacher has so many benefits. When this separation between management and community is removed, the classroom becomes that much more productive. If the teacher and students have understanding between them, including respect and rapport in their relationships, they students will feel comfortable to

be themselves, ask for help where needed, and be the person they truly are. They will also be more willing to follow the expectations of the classroom if they understand why the expectations exist and how the expectations could benefit them. This understanding makes them trust their teacher and classmates, and will lead to a more positive and effective learning environment.

Overall, classroom management and culture are not separate ideas and concepts. They are one thing, because the way a teacher builds a classroom involves how they make their students feel, how they make sure that everyone knows the expectations on how to act, and how they teach their students to treat each other. The climate and culture is the community and expectations that a teacher and their students create for themselves in the classroom. Then, the management is simply how the teacher, in the best cases with the help of the students, chooses to enforce those expectations. When students have a role in this community building and feel valued and included in that classroom culture, they will feel more comfortable to be themselves and be real learners with faults and needs, which allows them to have more success, more learning, and more growth for everyone involved.

Chapter 3

Inquiry-based and Hands-on Learning

And the Importance of These in an Elementary Classroom

Anyone who has spent time with students knows that they love to get their hands on just about everything. They love to pick it up, look at it, toss it around with their friends, and even do some of their own rudimentary, basic, simple experiments. A teacher can tap into this desire, and bring in what is referred to as hands-on learning, or children learning through manipulation or materials or objects related to what they are learning. Many studies have shown that when student do learn hands-on and have chances to manipulate, they perform significantly higher on any testing, and have a better comprehensive understanding of the topic (Varelas, Pieper, Arsenault, Pappas & Keblawe-Shamah, 2014). A pre-service will also see that students love to ask why and how about nearly everything. They never cease to want to know more and inquire deeper into any subject. So why not use this as well? This is called inquiry-based learning, where students find answers, formulas, and ideas themselves (while led by a teacher), in order to gain a better overall understanding of the topic, as well as learn research and group-based skills (Smith & Landry, 2013). This same cited study shows a definitive increase in the performance and understanding of children as young as 6 years old when they engage in inquiry-based learning. The complex thing about this, though, is that every teacher, school, and district has a different understanding of what inquiry-based learning is and what it looks like, and many professionals in the field find it very difficult to define. I understood what each of these ideas were going in to my first placements, but my understanding radically changed as I had my own hands-on experiences with students and their learning.

As I said, I knew that both of these pedagogical methods existed, but in my head, they were the same thing. I believed that inquiry-based learning only happened when students were hands-on, and vice versa. I also did not think they were that important, believing that doing a lesson hands-on was something to be done as a fun review, or when the teacher had an extra day to spare. The content, I believed, was more important, and that hands-on and inquiry-based learning were completely separate from that. They were not a regular part of the curriculum or something to be expected of from all teachers. Now I know how wrong I was, but it took me a surprisingly long time, and quite a few placements to learn that.

In Block 1, in a suburban first grade classroom, I worked one-on-one with a student doing intensive phonics tutoring. A lot of our time was spent using a soundboard, essentially a creation that allowed her to move letters around to create words and practice her letters and phonemes. The student did not progress much in our time together, often because I could not keep her attention and focus on me, and she would want to go do something else. I used the soundboard to counter this, allowing her to move the letters we were using around herself, hold the flashcards, or have hands-on control of what we were doing. In this case, I saw hands-on learning as something helpful, but just for non-content reasons. I saw it as a way to keep the student interested and engaged in the lesson. I even used this as a rational in my reflections, as that she just kept getting distracted by anything I did (Appendix F). I did not see it as helping to her to actually learn the content, and using inquiry-based learning never even occurred to me, I thought she was simply too young and struggling too much. Also, in this placement, I did a lesson with another student in which we practiced finding the main character traits in a story and how that made the characters act a certain way. In order to do this, I created little note cards with character traits, and had the student sort them correctly by which character they referred to. The

student enjoyed this immensely, and also seemed to learn through moving the cards around and deciding on each one (Appendix G). However, the planning and implementation of the lesson was incredibly difficult. The student would try to grab them from me, move them around while I was talking, and she got so into the cards that she actually missed the explanation for one of them and the definition I gave her for a word. I saw that these cards and hands-on learning were helpful, but I almost felt that it took so much more effort that it was not worth it.

So, after this, I readjusted my definitions of what these two ideas were. I had not had much experience with inquiry-based learning or seen it in the field, so I still thought that it was something extra that perhaps belonged in math and science and in the older grades. However, I had now had significant experience with hands-on learning. I began to see the benefits of it: keeping students more engaged and interested, increasing participation, and allowing students to work together physically. However, I still saw hands-on learning as too difficult to be worth the effort, since when I had used a hands-on strategy the logistics and management were difficult, and in the only other instance I used it simply to keep a student's attention. I began to realize that hands-on learning might have its place in the classroom, but I did not think yet that that meant in every subject area, and certainly not on a regular basis.

Then Block 3 happened. In Block 3, there were 4 pre-service teachers in one classroom, all of us working on the material with the students during the week, supporting each other as head or supporting or small group teachers. In Block 3 we also had 2 weeks for every subject (math, science, and ELA), where that was all we taught and that was our sole focus. When we taught science, we taught our fourth graders about electricity, electric charge, lightbulbs, and electric currents. In order to teach this, we gave the students batteries, lightbulbs, wires, and connectors, and gave them challenges to solve, like making the lightbulb light up, making two

bulbs light up, or lighting one without lighting the other. This forced them use inquiry-based strategies such as peer to peer discussion, trial and error, and brainstorming, to solve the problems presented to them, and work together to make the bulbs and circuits work. They also were working with their hands this whole time, manipulating all of the parts, holding things for each other, and seeing the bulbs that they were holding light up because of what they did (Appendix H).. They loved this. Every time they saw the boxes out on the tables they were excited to get a new problem to solve. And when we then had discussions at the end of the day or the week, they could use what they had done and their experiences to share (Appendix H). For example, one student told us how the wire had to be touching a certain side of the battery in order to work, and her group helped her to decide on wording to show the rest of the class that the wire had to go from the positive end of the battery before the lightbulb, and the negative end after the lightbulb. They were able to talk about this and work through it together since they had had the chance and responsibility to discover it, and the chance to work with the wires and see when it worked and when it did not (Appendix H). This understanding was based on their inquiry-based learning and hands-on experiences.

Then, later in block 3, we had our two weeks of math, mostly working with our students on fractions. In order to do this, we had them all make fraction kits, essentially seeing in their own hands while cutting and folding the relative size of the fractions and their relationships to each other. They, most importantly, saw for themselves that a bigger number on the bottom meant a smaller piece of paper, something that is often almost impossible for young students to grasp (Appendix I). They then used this activity throughout the rest of the unit to order and compare fractions. We also did a lot of 3-Act Tasks, which are in essence math problem solving tasks, in which students have to figure out what they want to know, how they should solve for

that, and then what the answer is. The answer is only one part of the problem, since figuring out how to go about it is so much more important. They are forced to use inquiry-based solutions to figure out what to do, as well as work with others in their group to discuss different ways of doing it. Even if, at the end, some of them had not gotten to what was considered the right answer of the question posed, they did have a better understanding of the concept. For example, when the students were asked about electricity in general, they could correctly use the vocabulary that they had learned during their investigations to talk about it, as well as correctly use examples from their work to illustrate that understanding. They also were more invested in and excited about what the right answer might be and doing the work. I know this because the second week we came in to teach science and the students saw the boxes of materials out, they were so energized and excited. They kept asking us what they were going to build today and what we were working on, and, after we explained the directions, they were so ready to get their hands on the materials and start trying until they figured it out.

After Block 3, I realized how wrong I had been about inquiry-based and hands-on learning, how closed minded I had been about them. These methods of teaching made a huge difference to my students in their learning, their interest and investment in the subject area, and their love of learning. They became excited, in a lot of ways, to learn something new and try something new out. I had a student tell me, after one of the block 3 math lessons, that she math “maybe actually was not so bad”. This may seem like a little thing, but this is a 4th grader who had told me almost on the first day that she did not like math and that she was not good at math. To hear her tell me that maybe math was not so bad and that she had actually understood something that day (she was able to explain to me what a fraction was), was just astounding. My lesson that day had made a difference to this student about how they thought of school and of

themselves. I saw through this placement, as well as in student teaching, that inquiry-based learning does not have to be something special, but rather can be something simple and easy to explain that you can do it in every subject, though, admittedly, it is hardest in ELA. When students have to solve an issue themselves and actually figure it out, they care more about the outcome, and are more enticed to solve it and to understand it. This increases their overall comprehension and retention of the information. Hands-on learning does something similar. When one is able to feel what is happening in their hands, see the moving parts, get their muscles to feel what is happening, it makes a difference. It allows students to figure out where they are right and where they are wrong, find new ways to solve, and problem solve both individually and together. Aside from the obvious benefits in education, these are important life skills that students are never too young to learn (Appendix J). Because of these experiences, inquiry-based and hands-on learning are now, to me, one of the most essential aspects of pedagogical content instruction.

Inquiry-based learning and hands-on learning are hard to implement in the classroom if not guided and prequeled correctly, and they therefore can sometimes be even tougher to plan for, for one must be ready for all eventualities. But if a teacher can put the time and effort in to make it work and to give the students real experiences, it can make such a huge difference in their learning and in their lives. But also, every group is different. An activity that works for one group of students one year might not work at all in another! This is because all students will react differently because they all have different backgrounds and understanding, and will try different problem solving techniques first, or assume something different will happen when they have an item in their hand. The circuits for example: some fourth graders had never seen a circuit before or had the chance to investigate one. However, there may be other students may have seen a

circuit, helped their parents with something around the house, have gotten to a science club, or simply have had more science education before that point. A teacher can not teach these two groups the same, so we have to adapt our teaching to the students we have. And this is not just true of inquiry-based and hands-on learning...we always have to adapt.

Chapter 4

Conclusions

On the Above Concepts, Teaching, Pre-Service Teaching, & Continual Education

One might think, in a first reading of this ethnography, that I was pretty naive at the beginning of my teaching preparation program, and was overly informed by the ease in which I had gone through my schooling. Trust me, I think I was as well. I look back now on that beginning of sophomore year and can not believe some of things that I said, taught, or believed. But as I wrote about it all and delved deeper, I have realized that this is not quite true. I was not stupid or wrong earlier, I was just being very surface level. My ideas were shallow and simple, and throughout all of this time they have become more complex, confusing, complete, and real. I have realized that all of the different parts of teaching are not separate at all, and that being a teacher, surprisingly enough, is hard. I have never felt as tired as I did at the end of a long week, and never cared as much about something other than myself as much as I care about my students. I did more than learn or grow. The experiences opened my mind in ways I could not imagine.

I also learned that every school and every classroom are a new challenge. Every teacher runs their own classroom differently, and that includes their routines, expectations, content, pedagogy and much more. So, as a pre-service teacher going into other people's classrooms, I had to adjust to what was expected in that classroom in order to teach the students the best I could. In terms of myself as a teacher, I will make a classroom that is an amalgamation of all of those, and will be built around how I believe my students learn best. Everything I have learned from every teacher and classroom and every set of students I have taught will help me. And though I will have my own different students and those students will change every year, the ones I have had in the past will inform the current year.

But in a similar way, I will likely have to modify each year just a bit for the students I have depending on their levels, culture, identities, abilities, and learning styles. And, going from this, every group of students will teach me something. Even if I become a tenured teacher, I will never know as much as I think I do, and I have to remember that I *can* and *will* always learn more. It is a never ending journey. Another part of this, and something else that is important to remember, is that no student walks into any classroom as an empty vessel. Students all have their own experiences and ideas and beliefs that they bring with them, that inform their learning and actions. As teachers, we cannot just expect to only teach our students: they are going to teach us too. We are learning together with our students, not teaching them facts like they are balloons that need filling.

Another way that teachers can keep learning like I have throughout my program is through Professional Development and Continuing Education. Though it can seem like quite an inconvenience that teachers in New York are required to get their masters degrees within five years, it also makes some sense. Teachers have to keep learning and growing, and one of the best ways to do that is by taking more classes and having more experiences with experts in the field. It is the same reason that we as teachers have to complete a certain number of hours of professional development each year as well to maintain the license. It is tough, but it is worth it. There are always new pedagogies and techniques to learn and try out, new programs available, and new standards to implement. The best way to learn about these is from people who know what they are talking about, which usually happens in a university or in professional development workshops.

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Appendices –

see highlighted sections for specific work related to topics above

Appendix A – 3-Act Task Math Planning Commentary and Reflection	22
Appendix B – Mental Math Planning Commentary and Reflection	24
Appendix C – Social Studies Behavioral Expectations and Lesson Reflection	25
Appendix D – Parent’s Night Reflection	26
Appendix E – Student Teaching Activity Log Weeks 3 and 7	27
Appendix F – Assessment Analysis of Tutoring Pre and Post Assessment	29
Appendix G – Comprehension Lesson Planning and Reflection	30
Appendix H – Science Unit Commentary Reflection	32
Appendix I – Math Lesson and Unit Commentary and Reflection	35
Appendix J – Math Small Group Lesson	36
Appendix K – Science Synthesis Paper	37

Appendix A – 3 Act Task Math Planning Commentary and Reflection

3-Act Task Commentary - Taught Friday 4/7/17

1. What was your instructional goal for this lesson?

My goal for this lesson was for students to recognize an array in a word/picture problem and to solve the array problem using a repeated addition sentence.

2. What did you learn about your students during this lesson? Please be specific.

During this lesson, I learned that my students really can not write. Even those that were putting something on paper were directly copying what I had written, and many wrote nonsense words and letters. I basically learned that I cannot expect my students to write at a quick enough pace to do within a math lesson. I also learned that my students are not very mathematically creative. None of them explored the problem to find a different way of solving it, and non tried to find an easier way than drawing out every single square. I believe this is because my classroom is not conducive to that - we follow a very strict module system that is geared toward much more traditional math smarts. My students are also very protective of their work, they only want to work and do not want to share. Because of this, other students did not really learn, and many students who may have had very interesting or creative approaches were stifled or too scared to share because it was not the 'right' or 'normal' way to solve. Overall I learned that I need to not include writing in a math lesson unless I want it to take over, and I need to basically teach my students how to work cooperatively and collaboratively in groups.

3. If you were to teach this lesson gain, would you make any changes to your planning, your enactment, or how you handled any particular moments? Explain.

If I were to do this task again, I would not make my students write even close to as much as I did this time. I would only have the teacher write the notices and wonders, as well as what we need to find the answer once we find the main question. Then, *after* that, I would give them a sheet with the main question already on top, a place for estimation, then space to work. With the estimation, I would do a lesson a day or so before estimation: what it is, why it can be helpful, and how it can assist in solving questions and checking answers. Then, when we got to that, it would make more sense to students and would go much smoother.

In terms of group work, I have 2 other ways I might try. The first would be to have all students do their work, then share as a group and come to a consensus, then share as a class. This would allow students to do their own work, but also force them to share with others and see other ways of solving. My only worry about this is that, although they have to discuss together, it reinforces the idea of doing your own work away from others and that we do not work together to solve a problem. The other way would be to only give one sheet of paper or whiteboard to each group, so that they have to solve it together and then share it. My only worry about this strategy would be that the most confident student would take over and student opinions and ways of solving would still get cut out.

Overall, I would prep my students more for the task and what it involves. Before we start, I would spend a lot more time going over how we work in groups, collaborating with others, and sharing ideas. Then, before the video I would tell them that this is where the questions and our problem will come from, so they should pay attention and think of questions they might have. As with above, I would also spend time beforehand going over estimation. I think with more

preparation and less writing, this lesson could have gone much more smoothly and students would have gotten more out of it.

Appendix B – Mental Math Planning Commentary and Reflection

Mental Math Instructional Commentary- Taught 3/5/2017

1. What was your learning objective for this lesson? How does that objective connect to what students have been learning in everyday math instruction?

My objective for students to understand why the vertical algorithm for addition works. I wanted them to explore how all of the strategies and methods for solving are all the same idea and the same reasoning, just different ways. In their everyday math lessons, the students do an application problem at the beginning then practice problems as a class, so this concept was not entirely new for them. They had never had to come up with answers independently so that was different, but they are used to sharing strategies to solve the application problems. The problem we did for mental math was actually one of the application for that day's math lesson.

2. Tell me what happened in your lesson!

The students first gave only one answer and were hesitant to share another. Once I said, "I'm not sure that's right" they suddenly had lots of answers to share! So after that we worked through the problem. The first way they told me about was the vertical addition algorithm, then the number bond way. Neither of these is really a mental strategy, so I believe they were parroting back what they do in class. After that though they shared making a chart to group 1s into a 10, and adding the 10s and the 1s separately then together. They really got into this once I asked, "what did you think in your head as you were solving this, not what would you write on paper if you were doing this." I also asked tons and tons of questions during their sharing, something they are not as used to. Usually once they start to give a solution they are basically given the rest of it by the teacher. So me making them explain the entire strategy by themselves was new and challenging, I hope in a good way. Mostly everything went as planned, but one thing I was upset about is that I do not think my students were completely honest with me. They told me great strategies that they have been using in class and explained them correctly, but I suspect many of them solved it in their heads by counting or regrouping. They are so used to giving certain strategies that they did not realize or feel comfortable sharing what they actually did in their head.

3. What would you change about this lesson to better support or extend student learning? Why do you think these changes would improve the learning opportunities of your students?

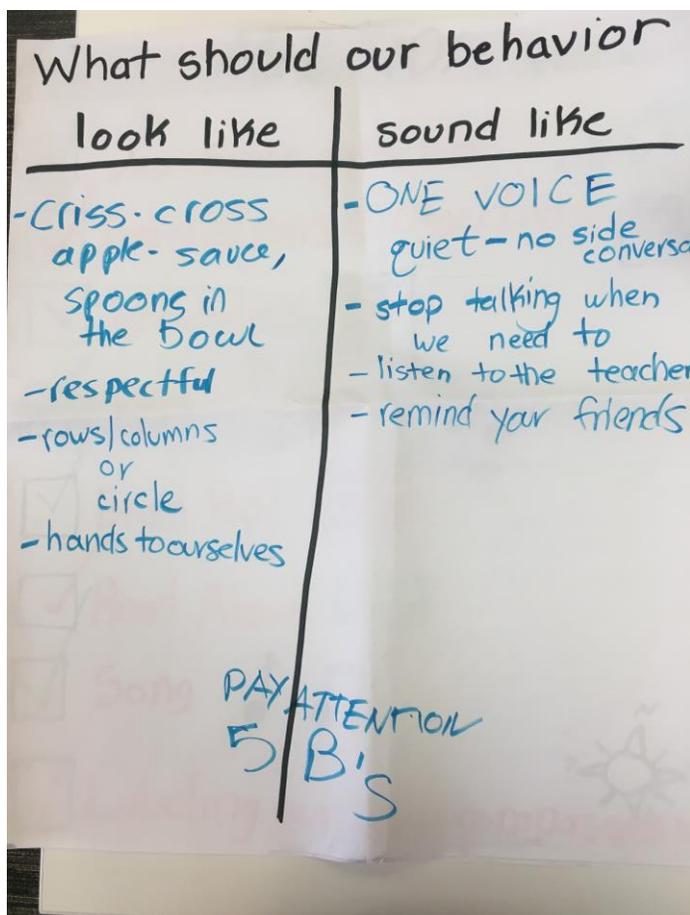
I would change this lesson to only allow 2 strategies they had used in class. I would force them to think of strategies they had not used before, and maybe share what was actually going on in their heads. I think this would have required them to think more creatively rather than just parroting back strategies they had used. I would also give them a problem they could solve in different ways more easily - maybe an easier problem that could be solved with counting on using finger counting. I would like them to explore strategies that aren't spoon fed to them and really *think* about the problem, not just the right answer.

Appendix C – Social Studies Behavioral Expectations and Lesson Reflection

Reflections on Planning, Preparation, and Teaching – Social Studies Lesson

Part F: Positive Learning Environment

In this lesson, I created a positive learning environment by changing up what we did as a class and allowing for appropriate changes and movement where necessary. I allowed my students to move around where they were sitting, as long as they could learn and those behind and around them could too. I also did not punish students for talking, but rather reminded them that we needed to listen to the teacher and classmates. Before all of this, we had gone over our behavioral expectations, so I would also remind them of those if they started to get too chatty. By having the behavioral expectations there and in play but not being overly strict about them, I created a positive environment for all of my students and their learning styles. I also allowed students time to answer if they were struggling articulating, and also gave them the option to call on a friend to help them. I incorporated turn and talks for all of my students for the same reason, to give them more time to gather their thoughts, hear other ideas, and be confident in their answers. To make the learning more fun, I also including dancing and singing, fun videos, and a book. Lastly, my purposeful grouping and having roles for each student allowed for all students to work together cooperatively and solve the problem together. All of this together created a positive learning environment in the classroom during my lesson.



Appendix D – Parent’s Night Reflection

This past week I attended parent’s night at [REDACTED] in [REDACTED]. I originally wanted to go because I knew that many first year teachers are lost or scared on parent’s night because they may have never been to one, so I wanted to get ahead of that and see what it was like from the teacher and parent perspective.

The purpose of the night was for the teacher to introduce themselves to their student’s parents, to go over the daily schedule and curriculum, and give the parents an insight into what their children do all day. To fulfill that, my teacher gave the parents multiple materials. The first was a daily schedule, which she went over in detail with the and explained the different activities and parts of the day. She also went over how birthdays are done in the classroom, as well as field trips and homework. She talked a lot about homework and why she does it the way she does (they have no written homework, their homework every night is to go outside and play, read for 10-15 min, and eat dinner with their family).

The next packet she gave them was a list of reading strategies for the parents and students to complete this homework. Last, she gave them the math curriculum for the year, while explaining that she does not exactly follow the common core. Rather, the students can solve a problem any way they like as long as they get the answer and can tell the teacher how they got it. There was also a letter to the parents from each student at their desks, and the parents wrote back to their students in the writing journals. This gave the idea to the parents of where their student was in writing, and what they liked about their classroom so far. She also introduced me and her TA. Then she opened it up to questions, which let the parents ask what they specifically wanted to know. Some parents had lots of questions and some had none.

The family response overall was very positive. 20 out of 25 families came, and they were all listening and invested. They seem to agree with and appreciate her position on homework and math, and all of them told her and her TA how much their students liked the class. They enjoyed my teachers jokes and funny statements, and how she talked about her students to them.

By going, I learned a lot about my teacher. Hearing her articulate her choices and reasoning to parents gave me an insight into why she does things a certain way in her classroom, and how she feel about her students. I also learned more about the homes that these students come from. I got to see their parents: their ages, styles, how they spoke, the questions they asked, and how they interacted with the teacher. It gave showed me where these students come from, and why they may act the way they act. I also got to learn what these students say to their parents when they get home, their opinions about school. I obviously did not learn everything about my students, but it was a good window into them outside of the classroom. Lastly, I gained so much respect for my teacher and all she does. She had to get all of the materials ready, decide what to tell the parents and what not to tell them, organize her classroom, and be confident and ready to speak to these people. I have so much respect for her and all she does.

Appendix E – Student Teaching Activity Log Week 3 & Week 7

Week 3 – Wednesday

Today for morning work we re-implemented the use of the morning work sheets. Each student got a sheet and had to check off what they were doing that day so that they and we could keep track. We also had our morning meeting that day by reiterating that we have to be quiet during morning work and really stay on track. We can not have chatting with computers or big groups working on flashcards. Also, today for independent reading we had them work on a packet that involved having them main idea and key details. One of the reasons we did this was that one of the women who comes into our room for intervention/morning work has told Mrs. Sourwine that it is too loud in the room, so we did this all to help her as well. This morning I sat in on conferences after I passed out sheets which was really nice to see how they work and how I can begin to help. I also saw how she decides their reading level and their power goals every time she meets. It is a lot of work for her, though, because she has to meet every student at least once every 2 weeks, which is a lot of time taken away from content and such. She got through 3 conferences today, which is a normal day for her, usually she can do 2-4 every day.

Specials!

Today in ELA we started really looking at ecosystems and what they are. We defined what an ecosystem was, gave some examples, and talked about what research questions would look like. We went through a whole PowerPoint about them, and we also talked about what living and non-living look like. We divided up the two, and did a chart for it. Mrs. [REDACTED] was called out of the room for a few minutes during that so I took over the lesson. I had students come up and pick an item, then put it into the right column. It was nice to be able to pick up the lesson so quick when needed and still have it flow. We also talked about how tomorrow they would get to start researching, and identified for them the different ecosystems they might have, so to start thinking about that and which one they might want.

Our writing today was another on demand writing again, which is not that fun. But the students had done it before, so it was easier to do it today. They had to today write an information text, which means explain what something is or how to do something. I am worried that some of them did not quite understand that and just wrote a story anyways. We only had about 30 minutes today instead of 40, which meant they had less time. Most of them were done a lot sooner than that, so no harm done.

Lunch –went really well so no need for a big long meeting

Math – observed lesson – see lp

Meeting – with supervisor about lesson

Recess today was a little interesting. We had the kids make cards for [REDACTED] since her last day is tomorrow, and overall they like this. They wrote cute notes and drew pictures and such, and asked about why she had to leave and other cute things like that. However, this meant that they could not go out to recess since it took some time, which they got super annoyed about. We had to have another talk about how doing something nice for someone is a lot more important than going out to recess one day. We also told them to keep it a secret until tomorrow at our party to make sure that she is nice and surprised. Day ended okay, but some of the kids still kind of in crappy moods about not being able to go outside, which was annoying to have to deal with.

Week 7 – Wednesday

During morning work today was the usual issue of keeping everyone on task, we seemed to have more trouble than usual, as well as finishing breakfast quickly and getting to work. [REDACTED] decided that she wanted to skip morning meeting today because she needed to get caught up on conferencing so we just worked straight through until special.

Specials today was music which they are generally good about.

Morning meeting – week reminders, my last week, tell me one thing you've learned about your ecosystem

Before we started ELA today I did a morning meeting of sorts. We did some reminders of what was happening, as well as that I only had 2 more days. I also had them tell me one thing about their ecosystem as we went around. This did not go as well as I had hoped. We had been working for so long that I figured they could all tell me something, but for some of them it was really hard. Because of this I did talk to them quickly about how we aren't just doing it to do it, we are doing it to learn, and after 2 weeks they should be able to tell me at least one thing they learned. Then we officially started ELA and did a quick review of the text features, what they were, and why they were helpful. Then I split them up into 4 groups – main idea, research lab, independent reading, and computers (imagine learning). I took the group doing their research lab. I ended up seeing 3 lab groups, since we did 2 rotations. One did really good and found 2 full rows of the threats, importance, etc. and was working actually really well together. The other two groups definitely had more trouble. One simply had trouble finding the information since it was scarce, but once I found resources for them they did better. The other group had trouble working together, which has been an issue for them from the beginning. I kept having to remind them to work together and share their answers and that this was group work. It really is one student who wants to keep everything for herself and won't share with her partner, who does ask for it. They both actually found a bunch of information, but had completely different information on their sheets. [REDACTED] ran the main idea group and said that they were working hard, and in general able to find the main idea. The first group finished the first passage and started the second, while her second group had one student leave for ENL, one break down, and one be a slow writer. So, of the students who actually did the work, it went well.

For writing today I did the rest of the whole group lp from yesterday and then a bit of editing by themselves. It was shorter than usual, but still okay. This was part of my unit LP

As a fun treat before lunch, I showed them the text features song which they thought was hilarious, and were also convinced that Taylor and I were in.

For lunch 4 students came up with us to have some time, and since the other teachers were out [REDACTED] and ate in the classroom.

During math we started the next lesson. This lesson had them counting by single minutes instead of just to the nearest one by skip counting 5s to an interval and then by 1s to the minute. We went ahead and did stations for this, same as yesterday with 3 groups. I was able to see 2 groups in stations, where we focused on the idea that skip counting by 5s was great, but other numbers exist in there too. I had them find where a number might fit on the number line, and what '5s' it would be in between. Then we did a ton of practice just reading the time on the clock. This seemed to really confuse them, because the next step of counting by 1s was too much. They went back to being confused by the hands, and when to count by 1s or skip count since those two ideas weren't totally exclusive. When we did an exit ticket of telling a specific time, only 3 of them got it right and 1 got close. Most of them did actually get the hour right, but almost all got the minutes wrong.

Appendix F – Assessment Analysis of Tutoring Pre and Post Assessment

Assessment Assignment 4 – Tutee Pre and Post Assessment

- Identify the learning objectives assessed and the Learning Standards being addressed.
 - Student will be able to correctly read the letter name and sounds correspondence for all 26 letters
 - RF.1.2: Demonstrate understanding of spoken words, syllables, and sounds (phonemes)
 - Student will be able to decode and read grade level Phonetically Regular CVC words.
 - RF.1.3: Know and apply grade-level phonics and word analysis skills in decoding words.
 - RF.1.3b: Decode regularly spelled one-syllable words.
 - Students will be able to read the first 50 grade level sight words
 - RF.1.3g: Recognize and read grade-appropriate irregularly spelled words.
- Explain what you have learned about your student’s learning and the student herself from implementing the assessment.
 - I have learned that my student is still below grade level in her reading and literacy, but is making progress toward that goal. She already knew most of her letters at the beginning (24/26 to 26/26), but had could only decode and blend those letters into words 30% of the time. I learned that using sound boards and working on letters she may have already known to solidify the knowledge worked well for her, and by the end she could decode or recognize 90% of the grade level CVC words. I also learned that she cannot recognize sight words. She tries to decode them like Phonetically regular words, so is only successful on sight words that are also regular. Some she does know from repeated use, but trying to memorize them together did not help her improve her sight word vocabulary a huge amount. So only got 15 more sight words after 2 months of working together.
 - I have learned through lots of time together that my student gets distracted and bored very easily. She was always excited to work together and would ask to, but then 10 or 15 minutes in would be unable to concentrate. We used the sound board, white boards, different books, fun flashcards and anything else I could think of, but she still would get too distracted to continue. She is a student who is excited to learn, but has trouble doing so because of attention problems. I think if I had a bit more choice in what I did, and maybe doing short sessions multiple times a day, we could have progressed more.

SUMMARY CHART:

	Letter Sounds	Letter Names	Sight Words	Phonetically Regular Words						
				Over-all	Short ‘a’	Short ‘i’	Short ‘o’	Short ‘u’	Short ‘e’	Digraphs (sh, ch, ck)
Pre-Assessment	24/26	25/26	28/50 56%	6/20 30%	2/4	1/4	0/4	2/4	1/4	3/5
Post-Assessment	26/26	26/26	43/50 86%	18/20 90%	4/4	3/4	4/4	4/4	3/4	4/5

Appendix G – Comprehension Lesson Plan and Reflection

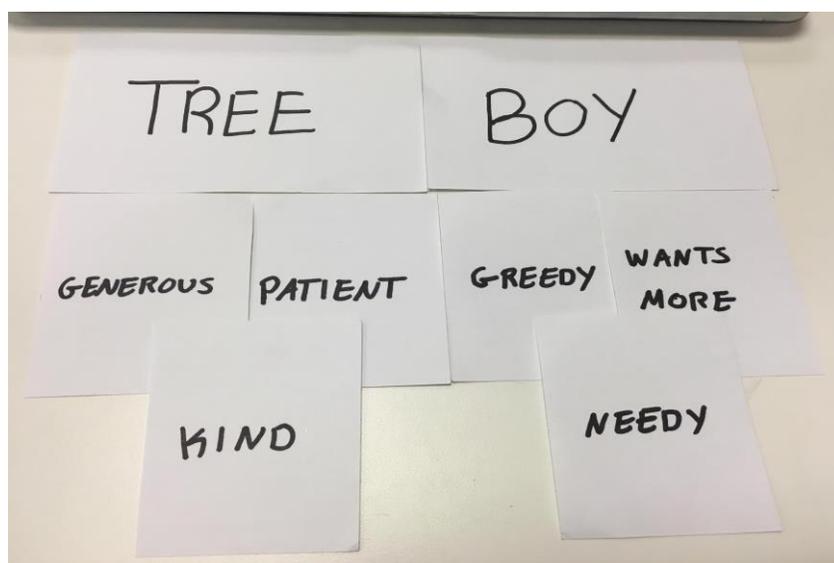
<i>LESSON PART</i>	<i>DESCRIPTION</i>	<i>ASSESSMENT TOOL</i>
How do you know you need to teach <u>(name of skill or strategy listed above)</u> to your student?	Standard 4: Character Traits and Motivations My tutee is working on characters in class, and why things happen. So I think it will be helpful for her understanding and to help her understand WHY things happen (because of character's actions/traits)	
Conceptual understanding that must be in place	What a character is What a feeling/emotion/trait is (will go over that) That a character can be an animal, plant, person, thing, etc.	
Name and author of text	The Giving Tree By Shel Silverstein	
The student's objective	Student will be able to identify a character in this story and explain their traits in terms of emotions and actions.	
What is the "secret" to doing it?	Making the book fun and interesting so she stays interested in the book. Also connect the characters to her so it is more personal	
Lesson Introduction	We're going to read this book together and talk about it's characters. What is a character? Do characters have feelings and reasons for doing things?	
Modeling the Thinking	I feel this, so that is a trait of mine. Do you think characters in books have feelings? What are some traits that you have?	Informal, open conversation
Scaffolded Assistance: Extensive Teacher Help	Read the book!	Informal, see if she's paying attention
Scaffolded Assistance: Less Teacher Help	Talk about what happened in the book: the plot. Did the characters have something to do with that?	Informal – ask about the characters and talk through the plot together

Scaffolded Assistance: No Teacher Help/Independent Practice	Sorting traits (pictured below) into “boy” or “tree” categories and telling me how she knows. I will read the word to her and define if necessary, but she will decide where it goes and why	Correctly sorted and explained to me
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Reflection:

Overall, my tutee was successful in our lesson and was able to complete our objectives. I learned that my tutee is very insightful to what people feel and think. She understands much better than she can read. She was quick to pick up on key ideas and reasons, and enjoyed talking about the characters. The lesson I had planned, in many ways, seemed too easy for her. I also learned that her issues paying attention reach into everything, not just working on words. When she said she was interested in and liked the story, her eyes and body still wandered and I had to draw her attention back to what we were doing quite a few times. It makes me feel better that when she is distracted during out tutoring, it is not because she does not care, but rather because she just has some trouble paying attention. She also got so into the cards at one point that she began to ignore me a bit, and that was difficult. The cards were fun, but they were an extra thing for her to be distracted by.

If I did this lesson again, I would read the book twice before the lesson. I would read the book without preamble, tell her in more depth what we were doing and what we are looking for, and then read the book again before doing my discussion and activity. I think this would give her a clearer understanding of the text, and would make the text ‘stick’ more with her. Also, by reading it after I tell her what to look for, she can look for specific ideas, emotions, thoughts, etc. This would have probably helped her come up with more concrete character traits. She was able to quickly identify which trait belonged to which character, but could not come up with her own. By reading it twice, I believe she would have been able to come up with more of her own ideas and thinking. Overall, I think the book I chose and the activities I planned I believe were successful and appropriate for my student and the standard I was teaching.



Appendix H – Science Unit Commentary Reflection

1. How did students' thinking build across your lessons? Support with evidence.

Our students, by the end of the lessons on circuits, had a better understanding about series vs. parallel circuits, and the pros and cons of each. They were able to articulate which would be better in a certain scenario, and use evidence from previous lessons to explain why. From this, we also saw that students have a strong understanding of the flow of energy in a circuit, and how the two types of circuits, as well as a switch, can effect that full circuit. From this idea of a circuit, they also were able to understanding energy being shared and energy being split, and the resultant brightness of bulbs and/or speed of motor because of that. They were able to connect the types of circuits to energy use and full circuits.

By the end of the lesson on magnets, our students also had a very increased understanding. They quite quickly understood that not all metals stick to magnets, as they saw that the aluminum nail was not magnetic, but the steel one was. They picked up that iron was what made something magnetic, not it just being metal. Also, our students understood the differences between magnets and batteries: north and south vs. positive and negative. Within that, they really understood the concept of opposites attract, and likes repel. They saw that there were similarities to how batteries interacted, but the repel was a new force for them to feel. A lot of them wrote in their science notebooks about a push and pull the first day, but towards the end that vocabulary began to transition to attract and repel. The last big concept that our students understood was how distance impacts the strength of a magnet. They began to understand that when a magnet is farther away, it does not work as well, but it works farther when you have more magnets. This was one of the phenomena they enjoyed exploring most.

2. By the final lesson you taught, how do you know students know more than they did at the beginning? Use claims and evidence to answer this.

By the end of our lessons, we were sure our students knew more than was their usage of more accurate vocabulary, such as attract and repel, poles, circuits, and, energy. This proper use of language shows us that they understood what they were learning and could apply it to other situations. They also were using this vocabulary in their writing in their science notebooks. Their writing increased by the end of our time, and they were very eager to write what they had explored and learned.

Not just in their notebooks were students able to express their ideas. They were all very active in small and large group discussions sharing their ideas and findings. They also volunteered answers to questions more readily and had more confident, longer and more complex answers when they did share. This shows us a level of comfort with the material and ideas that they were using, which allowed them to feel confident sharing their ideas with others, and making claims and predictions using the evidence they gathered in the investigation. They were more comfortable during those investigations as well. They were able to put circuits together, use them all, understand how the parts interacted, and make predictions about what would happen. This shows us that they felt more comfortable with what they were working with.

3. Evaluate the degree to which students' thinking aligned to the evidence statements of the NGSS.

The evidence statements included in the NGSS for the 4th grade energy module includes significant information about what is expected of students by the end of the unit. The overall

statement listed in the NGSS for 4-PS3-2 (energy) states that, by the end of the unit, students can: “Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat and electric currents”. The major aspect of the energy unit that our lessons were focused on was electricity and magnetism (which is not included in the standards). In terms of the specific aspects of the NGSS that we covered, the students learning is fairly aligned with evidence statements. Specifically, the NGSS mentions that a major observable feature of student performance that should be evident by the end of the module is that students will be able to describe “electric currents producing motion, sound, heat or light”. We noticed that students were able to create series and parallel circuits accurately, by the end of the unit, and describe the purpose of each element (battery, bulb, etc). Additionally the NGSS states that students should be able to provide evidence for an explanation of how energy is transferred from place to place by electric currents. By the end of the module, students were able to articulate the flow of energy within a series and parallel circuit both verbally and through writing in their science notebooks.

Student learning was also aligned the evidence statements in the form of using evidence to explain different phenomena. Students are expected to voice their ideas and use accountable talk to share with their peers so explaining, or attempting to explain, various phenomena has always been a strong suit of the class. However, by the end of the module students were using more sophisticated science vocabulary and were able to more clearly back up their ideas with evidence from the explorations.

4. Explain how your unit addressed one of the central principles described in readings from the beginning of the semester.

One of the key principles from the Science Framework is that science requires both knowledge and practice. That knowledge is acquired during hands-on explorations that are inquiry based and use problem solving approaches. This was at the very core of the Energy unit we taught our students. During the week we taught circuits, students were given a challenge or a problem to solve at the beginning of the lesson, which ranged from lighting two bulbs with a single battery to figuring out which circuit to use (series or parallel) so a string of lights stayed on if one of the lights burned out. After being assigned their task, students spent time working through the problem with materials at their desks. The week spent on magnets also used the hands-on, inquiry-based approach.

The Framework also emphasizes that collecting evidence and data are key to making claims. Throughout the unit, students did this in their science notebooks, which they then used to make claims about what they were seeing. The Framework also says that science is, “fundamentally a social enterprise.” This means that much of the new ideas and theories that are put forth in the realm of science are done collaboratively with peers working together. This was the format for our lessons as well. All of our students worked in small groups, working together to collect their data and analyze it. Often times at the end of our lessons, groups would share their ideas with each other, giving students a chance to see each other’s thinking, as well as allowing them the opportunity to critique their own thinking.

5. Think broadly about the experiences you’ve had in your classroom, including writing, intervention, recess, or other interactions you’ve had with students. What are you noticing about their strengths? What are you noticing about their needs? How can science teaching address bolster their strengths and develop their areas of need?

Our students have a lot of strengths that help them grow as students and individuals as well as helping us teach. We have a strong classroom community where students work well together, are eager to learn, and encourage and support each other. When playing outside at recess, sitting and working together on the carpet, or working at their desks in small groups, our students can work with most others in the classroom without an issue. There is a strong sense of respect for cultures, people, ability levels, and authority present in our classroom.

When working in the classroom, our students have very strong accountable talk skills and use them often. They are able to work independently when needed but are comfortable sharing their thoughts and ideas in whole and small groups. Assigning roles is something that plays to our students' strengths because they like having the routine. Roles such as lead scientist, line leader, snack helper, and teacher's assistant are given each week.

Along with the many strengths of the students, our classroom has specific needs to be met for optimal learning. [REDACTED] is very consistent with her behavioral expectations in the classroom and always follows through with her consequences. If students do not have this, some will stop following the behavioral expectations of the classroom because they know there will be no consequences. With this, a lot of specific redirection is need. In content areas, students need to be reminded of their voice levels, and the work that is to be completed at the time. Their expected work is left up on the board while working for easy reference for the students. Encouraging and giving positive reinforcement is another need of our students to keep them motivated to do work and on task. With half of our class reading below grade level, support with reading and writing with sentence starters and writing main ideas on personal whiteboards is another need of the students in our classroom.

Science teaching can both bolster these strengths as well as develop the areas of need in the class in a variety of ways. Writing in the science notebooks they are able to use their accountable talk skills in their writing as well as working individually which many strive with. It also helps them develop their concentration skills and gradually needing less redirection. The roles of the lead scientist help keep the routine as well giving students roles within the routine to keep students focused on the content.

The small groups enhance their great cooperation skills even more. The small groups are grouped heterogeneously, and the students work with different ability levels and personalities. The scaffolding of the inquiry-based lessons in science help students develop their group work skills because the multiple perspectives are helpful in these lessons. But it develops their needs because the group work allows for the students to get positive reinforcement from their peers and their peers can also redirect students who are off task in the group.

And while most of our future classrooms will not have as many adults in the room, the students have so much positive reinforcement present in the classroom at all times. It allows for more eyes to see when and where redirection is needed as well give the students as much positive reinforcement needed.

Appendix I – Math Unit and Lesson Commentary and Reflection

1. What was your lesson objective for your teaching for this day? What instructional activities did you use to address it? To what extent did students meet those objectives? Give examples from the lesson and from student work to support your claims.

My lesson objective was for students to be able to compare and order bigger, smaller and equivalent fractions of different denominators using a line plot. The instructional activities to support this were a whole group clothesline math, and, in small groups, creation of fraction kits and math journals with questions for students to answer. The clothesline math had students, as a group, place fractions and mixed numbers of different denominators in order, as well as showing fractions that were equivalent by placing them in the same place. This encouraged students to compare and order the fractions, as well as see when two fractions of different denominators were equivalent. Some students even used models (tape and area) to show this, and I wish I had done more, since these very much seemed to help students who were struggling. The creation of fraction kits further this, since the denominators used in the clothesline math were the same as those used for the fraction kits. Students were able to explore how many $\frac{1}{16}$ ths fit into $\frac{1}{4}$ or $\frac{1}{2}$, which gave them a more conceptual understanding of equivalence. It also prepared them for the next day to play cover up. The math journals addressed the part of the objective about line plots. The journals first had them create a line plot based on the clothesline, especially paying attention to the equivalent fractions. Then, in their journals, they placed another number of the line plot that was not on the clothesline to show them how to use it, as well as have them use what they knew about other denominators to place it correctly. The last question, which many students did not get to, was to identify the biggest and smallest number and explain or who how they knew. This got to the part of the objective about ordering bigger and smaller fractions. I have quite a bit of evidence that shows me that my students met my objective. The students were able to correctly place almost all of the mixed numbers and fractions on the line plot, as well as help their fellow students understand if they did not. What they mostly understood was how to order and compare the fractions, as well as how to prove their equivalence. However, some of them still struggled with the mixed numbers. The students would look at just the whole number or just the fraction to place it, instead of looking at both to place the number. This was not something I expected to address, but did end up pausing slightly on it during the lesson. I also saw that my students were very successful in turning the clothesline into a number line, but adding the 'x' about each number to show its frequency (to make it a line plot) was new to them. Many of them had success with it, but it is not 100% yet, especially because it was the first time doing it for many of them. So, I would say that my students met many parts of my objective, though they may not have met the part about mixed numbers, or the part about specifically using line plots

Appendix J – Math Small Group Lesson

April 30, 2018

Lesson Plan: Tenths & Hundredths Kit

Focus Question

How can I represent one-tenth of one whole?

How can I represent one-hundredth of one whole?

Lesson Sequence

1. Give each student one meter-length piece of paper. Let them know that this is going to represent one whole.
2. Ask them to fold the paper into ten equal parts.
3. Students will turn and talk about what each single part of the whole represents (tenths).
4. Students will take ONE of the one-tenth sections and fold it into ten equal parts.
5. Students will turn and talk about what each single part of the tenth represents (hundredths).
6. If time allows, students will cut out the pieces and explore, individually or in pairs, the relationships between one whole, one tenth, and one hundredth.

Rationale

This activity gives students the opportunity to visually see one whole, one tenth, and one hundredth. It gives them tangible materials to work with, a physical way to think about a more abstract idea. Additionally, it allows students who are tactile learners to work with the materials.

Appendix K – Science Synthesis Paper

1. What are the most important factors to consider when planning science lessons/units? There are 3 important factors for me when planning science lessons. The first is to always make sure that lessons and learning is inquiry based. This means having students explore hands on and find solutions to problems with their groups. It also means the teacher does not give students the answers, or exactly how to solve the problem or concept. The second is to keep all lessons standards based. This means that we should always consider the NGSS when planning, and keep in mind the constraints of each. We also have to use the SEP and CCC, not just the DCI. The last thing to keep in mind is to always have students use their science notebooks to write or illustrate. This can mean writing claims, writing in small groups, answering an extension question, diagraming what they have found, or so much more. But it is really important that we have students write to practice writing itself, as well as to get ideas on paper to reference/use at a later time.

2. As you move ahead into student teaching, name three “things” you learned about teaching science that will influence your future instruction. The first thing that will influence my future instruction of science is that science really relates to the other subjects, especially ELA. By having students write as well as read about science and use their language to describe what they are doing, we are using and improving ELA skills. The second big takeaway is that we have to teach science as much as possible (every day would be best). This is because it is one of the four core subjects, and one that will be used extensively in later life. Also, the skills of cooperation, claims, evidence, and group work they learn by doing inquiry based science are ones they need to be productive members of society. My last big takeaway is to always have students use productive talk. This means having turn and talks whenever there are class discussions, as well as encouraging and expecting full participation from every group member. It also means teaching and reinforcing productive talk throughout the year in every subject to make sure that students are using it and using it appropriately/correctly.

3. What does teaching science have to do with being inclusive? Science teaching, if done right, is incredibly inclusive. I saw this in my classroom when we had 4 students from the 15-1-1 classroom come up for science almost every day. In science, especially inquiry based science, every has a shared experience through that inquiry and struggle. Also, by working in groups, students learn how to work with others, problem solve, come to consensus, and respect and consider the ideas of others. Lastly, the teacher can make science even more inclusive by using purposeful pairing, extension questions, giving group roles, and assigning a leader of the day (or something similar). This way everyone can participate in the inquiry and have a sense of worth and accomplishment.

4. How can we teach science in a way that promotes peace, justice, and hope? Science can promote peace, justice, and hope by the way in which we teach. When we have students who are different working together, they learn to resolve conflict or discipline peacefully. By listening to the ideas of others and respecting those ideas, they experience peace and justice. By being able to creatively solve what might at first seem like an impossible problem give students hope that they can persevere and solve anything, and helps them look for creative options or ways they may not have thought about before. Lastly, science shows students that the world follows

rules, laws and patterns. Knowing that there are some things that happen no matter what or are true no matter what is a comforting thought, and can promote an idea of justice in the world. While this is not an explicit learning from science, I know I gain a sense of grounding and faith in the world knowing that the laws of physics must always hold true. Yes, that's a bit above a fourth grader, but I do not think that makes it any less important.