

Samantha Wile  
Teaching Preparation Program  
IQP Final Paper

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## **Acknowledgements**

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## **Background Information**

The Wachusett School District includes five towns and has 13 schools in total. The district contains individuals from Holden, Rutland, Paxton, Princeton, and Sterling. The district's mission statement states their mission is to “ensure meaningful student growth and promote social emotional well-being in a safe and nurturing environment. We will integrate the talent, experience, and knowledge of all members of our community to develop lifelong learners, equipped to think critically in an ever-changing, global society.” The district has around 7,100 students in it, with the majority of these students (87.2%) being white. The next largest population of students is Hispanic (5.4%), followed by Asian (2.9%), African American (2.2%), multi-race non-Hispanic (2.2%) and Native American (0.1%). The teacher to student ratio is 15.4 to 1, higher than the state's 12.9 to 1. Of the district's staff, 98.8% are white, the remaining 1.2% are Hispanic, African American, and Asian.

WRHS is the only high school in its district and has about 2,100 students enrolled. Racially, the students are 88.5% white, 4.8% Hispanic, 3.1% Asian, 1.8% African American and 1.8% multi-race non-Hispanic. 20.7% of the students are high needs, 13.7% of the students have disabilities, and 9.5% are economically disadvantaged. Linguistically, English is not the first language for 1.1% of the students, and 0.1% of the students are English Language Learners (ELLs). At WRHS, the teacher to student ratio is 14.7 to 1. The staff is 99.2% white, with the remaining 0.8% being Hispanic and Asian. The school performs very well in the Massachusetts Comprehensive Assessment System (MCAS) tests, especially in math. The Composite Performance Index (CPI) at WRHS for the math MCAS is 97.5 compared to the state CPI of 89.8. In the school's Algebra I classes, there are four different levels. From highest to lowest, there is Algebra I Honors, Algebra I CPA, Algebra I CP, and Fundamentals of Algebra I. The two types of classes I teach are Algebra I CPA and Fundamentals of Algebra I. Most students take Algebra I CPA and Fundamentals of Algebra I as an inclusion class that is also assisted by a paraprofessional. I have three sections of Algebra I CPA (A block: 19 students, E Block: 22 students, F block: 23 students) that consist of all freshmen. I have one section of Fundamentals

of Algebra (D block: 11 students) that consists of mostly freshmen (one sophomore who failed the course the previous year). Also, the school has a one to one Chromebook program. Every student has a Chromebook provided for them by the school.

## **Well Structured Lessons**

Well-structured lessons are a key proponent in the classroom. A well-structured lesson entails a beginning, a middle, and an end to a lesson. Most often this beginning is a Do Now or a Problem of the Day, but sometimes can be answering questions if it happens to be before a quiz or test. The middle is the main part of the lesson, which can be notes or an activity of some sort. The ending should have a closing or a summary of the lesson for the students. Lessons should have a performance task for the students to complete in order to let the teacher know if the students are grasping the material or not. The performance task demonstrates each student's level of understanding, and if the student has gained mastery of an objective. One theory behind well-structured lessons is the backwards design process. The backwards design process impacts student learning because it helps ensure that all students can succeed in a class. Learning goals and assessment designs are completed first, which allows teachers to design their lessons with these in mind. The lessons are developed to help each student to learn and achieve the learning goal. Since lessons are designed with the student's success in mind, it naturally puts the learner at the center of the design.

Throughout my time at WRHS, my ability to create well-structured lessons has fluctuated. In the beginning of my teaching practicum, I was strong in creating objectives for the lessons and material to supplement the learning goals, as well as writing a formal lesson plan. The quality of my lesson plans did not tend to change over time, however, I did struggle to keep up with the formal lesson plans. I would always have material prepared for the students, however, as the practicum and my classes at school picked up in pace, there were times when I could not have my formal lesson plans written on time. Formal lesson plans are important, as these ensure that your lesson meets the appropriate standards. I have grown to make sure that these are always completed on time.

To accommodate the different types of learners, when I go through lessons I make sure to verbally say what I am doing as well as write the specific steps down on the board. This helps the auditory and visual learners understand the material. Also, I have the students complete one or two example problems on their own during the notes so I can see if we need to do more problems together before moving on to individual practice. Lastly, I post the notes on Google Classroom, which every student has access to, in case they missed class or missed a section of the notes.

In the beginning of my practicum at WRHS, my lesson plans were very traditional; I mainly completed notes at the board and had the students practice with worksheets. There were times when I would have the students complete practice on whiteboards, but the types of activities we did were limited. My professional goal was to increase the different types of activities I did with my students to 2-3 per week. In able to do this, I gave my students a survey which asked for feedback about the types of activities they like to do as well as their feedback on the pace of the class (Read more about the survey [here](#)). From the survey, I was given more types of activities to incorporate into my lesson plans.

## Adjustment to Practice

In order to grow, teachers need to adjust their practices. In order to adjust to practice, one must use [reflective practice](#). After reflecting upon lessons and assessments, teachers use what they learned to change an aspect of their teaching. Possible ways that teachers can change include the way they deliver information, the supplementary materials they use, or simply the directions on an assessment. Adjustment to practice is so important because like reflective practice, it is one of the main strategies for teacher improvement.

Throughout my teaching practicum I constantly asked Sam for advice on how to improve my teaching. Overall, she suggested that I speak slower during class and always be sure to keep my energy visible to the students. She also suggested small aspects of the lessons for different sections. For example, when I taught literal equations, she suggested I show the students a graphic organizer to help them keep track of the different variables and how they affect the equation. After discussing this, I added the graphic organizer to the notes I gave the class. She also suggested different techniques for remembering different topics.

After having my students take the [Quarter One Survey](#), I looked at their answers to see what I could change about the way I teach. The most popular answer to "Are there any other types of activities you would like to do in class? If so, what are they?" was to incorporate more games into the classroom. Some students specifically suggested Kahoot or Gimkit. Due to the number of students who wanted to have math games in the classroom, during the next unit, I used a Kahoot to help the students review before a quiz. This is also the reason why I used the [Slope Intercept Battleship](#) game to help the students practice graphing in slope intercept form. I would recommend that every teacher gives their students a survey, as each group of students learns differently. I would also advise to give one around week 8 or 9 - the students have become adjusted to the new year, as well as opened up in class by this time and are more likely to be honest.

## Meeting Diverse Needs

Meeting diverse needs allows for different types of learner to excel in the classroom. The three main types of learners are auditory, visual, and kinesthetic. Practices that help kinesthetic learners excel are already included in most math classrooms, as example problems are one of the main practices in a math classroom. Auditory learners excel best when they hear how to complete problems, where as visual learners learn best when they see how to complete them. In order to allow all students to be successful, it is important to address all types of learners during lessons.

As mentioned in [Well-Structured Lessons](#), I was very traditional in the way I structured my lessons at the beginning of my practicum. While I was traditional, I made sure that I wrote notes on the board and verbally conveyed information to address all types of learners (in my classroom). I would say what I was doing as I solved each problem as well as write the steps down to the side of the problem. This helped auditory and visual learners, as well as those on an IEPs and with 504s. Some of the students with accommodations required visual reinforcements. As mentioned in the Well-Structured Lessons section, I post the notes from lessons on Google

Classroom. This accommodates those students who require copies of the notes to meet individual accommodations outlined in an IEP or 504.

As my practicum progressed, I added different types of activities that would help different types of learners succeed. In the beginning, I typically had the students complete worksheets, practice on whiteboards, and Edulastic practice. Edulastic is an online tool that can be used to give assignments; there are questions already on Edulastic based on certain standards, or teachers can create their own. The students' midterm exam will take place on Edulastic (in preparation for the MCAS, which is also online). As I continued teaching, I used Delta Math a few times (the students have to get a certain number of questions correct before the assignment is finished), textbook resources, and online materials such as Kahoot! to engage students. Kahoot! is an interactive quiz that students can access all at once online. Also, there is a contest involved that takes into account the number of questions correct as well as the speed of the answers. This engages the more competitive individuals in the classroom. Another fun activity I incorporated into the classroom was a version of Battleship with graphing equations in slope-intercept form. Students plotted points that represented their ships, and would take turns with a partner guessing different lines in slope-intercept form to try and intersect the points. If all the points of a ship were intersected by lines, that ship sunk. Find the worksheet from the activity [here](#).

As a part of the Teacher Preparation Program, I became endorsed in Sheltered English Immersion (SEI) teaching. English Language Learners (ELLs) have different needs than other students when it comes to learning in the classroom. ELLs are facing the challenge of learning a content area while simultaneously learning the English Language. Also, they have the challenge of learning about a new culture – often times these students come from cultures with different values than those in America. For example, the American education system promotes individualism whereas other cultures promote collectivism (<https://eml.berkeley.edu/~groland/pubs/IEA%20papervf.pdf>). This can be a shock for ELLs to adjust to American's education system, which is why SEI teaching is so important.

I did not have any ELL students at my time at WRHS. However, I did have the opportunity to observe another teacher, Mrs. Bailey at the school who had ELLs in her class. One takeaway I gained from my observation experience is that the techniques to help ELL students help all students. The strategies Mrs. Bailey uses includes personal dictionaries, repetition, visuals, relationship building that helps all of her students succeed. By practicing these strategies even when there is no ELL students in the classroom, a teacher can promote an engaging learning environment for all. My third take away from my observation experience is that sometimes it is necessary for an ELL student to move to another class. An ELL from Puerto Rico in Mrs. Bailey's class was having a hard time, but not from a language barrier. It seems that he had a gap in his math education and was missing key background knowledge that was necessary for him to succeed in her class (number sense, operations, etc.). While she was trying to work with him to catch him up to speed, she could not give him the time he needed to do so while still being there for all of her students. While the student has not moved classes yet (due to district/politics), Mrs. Bailey continues to tries to get him caught up and move him to the right placement as well. As a teacher, I will need to be able to understand the abilities my students have that are solely content based (where language is not a hindrance). Often times ELL can be placed into the wrong classroom (whether it be in a level too high or too low) and I will need to be able to recognize and help that student be in the right place for he or she to succeed.

As a part of the SEI Endorsement Class, I completed a lesson plan with language objectives that can be found [here](#).

## **Safe Learning Environment**

Maintaining a safe learning environment in the classroom is key for students to learn to the best of their ability. A safe learning environment is a place where students can be comfortable learning and not afraid to take risks or make mistakes. “Safe” is both in terms of emotional safety and physical safety. Safe learning environments can be produced in a number of different ways. Teacher expectations and classroom routines foster an environment for students to succeed. Behavioral expectations promote a safe learning environment – for example, respectfulness. Many teachers have some form of “be respectful” as a classroom expectation. If everyone in the classroom is respectful of one another, then students will be more open to answering/asking questions in class. By doing so, they are able to learn more since they are not worried about what others might think. Behavioral expectations often are for the student to work productively, which means their learning would increase. Setting the classroom expectations should be done on the first day, so the students know from the very beginning how they should act. Classroom routines should also be done on the first day. These routines (i.e. take out your notebook right away, do now every day, etc.) will give students structure and comfort in the class. The structure and comfort then promotes their learning in a safe space.

One way that I provide a safe learning environment is through the classroom expectations posted on the wall. These expectations were also discussed the first day of classes. The expectations are to be prepared, be respectful, work productively, and maintain a safe and healthy learning environment. Maintaining a clean and safe classroom pertains to a physically safe learning environment. By making sure the aisles are clear, in case of an emergency, the students can quickly and easily leave the classroom. Another important aspect of the physical safety of my classroom is that the room is nut free. I have one student who has a very severe nut allergy; the allergy is airborne and he will have reaction even if nuts are in the same room as him. For this reason, it was very important in the beginning of the year to stress that the classroom was nut free and make sure that no one had a snack that contained nuts during the snack period. Also, I make sure that everyone properly cleans up their snacks to make sure the classroom does not get any ants or bugs. For emotional safety, I mainly ensure that everyone follows the "be respectful" expectation. If students started to laugh if someone said the wrong answer, I would remind them of the expectation and explain to them why how they were acting was not respectful. By doing this a few times, the students learned what it meant to be respectful and limited the number of outbursts that occurred.

As a part of one of the professional development days at WRHS, there was a day spent on training to be a certified Mental Health First Aider. We discussed non-crisis and crisis situations pertaining to mental health. For the majority of the day, it was non-crisis situations that we discussed as these are the majority of the situations and can often be confused with normal teenage behavior. For example, moodiness and a desire for privacy are both normal teenage behaviors and signs of a mental health problem. We discussed how since these signs are so similar, it is important to take note of them but perhaps not do anything drastic until more signs appear or a more concerning behavior does. Also, we were trained on how to handle a crisis

situation (i.e. if a student were self-harming or discussing self-harm). By learning these different signs and procedures, I am able to recognize when students are in need of help in my classroom.

## **High Expectations**

High expectations in a classroom incorporates showing students that effort plays a large role in the mastery of material. For students to continue to push themselves in class, teachers need to have high standards. These high expectations is part of the reasons students strive to improve and grow in classes. Teachers should challenge students, but show them ways to complete the material. This is one way that students grow; if they are never challenged, they never learn new ways of thinking.

Throughout my time at WRHS, I had high expectations for all my students. I demonstrated these high expectations in many different ways. For example, during notes, I would provide example problems that became more challenging as the lesson went on. Sometimes, students had to complete them on their own. As they completed the problems, I would walk around the classroom to look at their progress. If a student was really struggling with the question, I would try helping them remember the first step of the problem. When a student makes a mistake, I always try and point out something that they did right in the problem before showing them how to fix their mistake. Also, I challenged the students by having them try different types of activities that prompted them to think about math in different ways. For example, in the [Slope Intercept Battleship](#) activity, students needed to think about where they wanted a line to go, and then come up with an equation for it. While some students understood the game at first, others needed a little more explanation first before being able to start the activity.

Another way that I challenge students is through the Do Now every day. Each day, I have a Do Now on the board that consists of three to four problems. Each student has the opportunity to complete the problems before I randomly choose three names from a jar of Popsicle sticks. Whoever get picked has to come to do the problem at the board. If they are nervous about completing the problem or are unsure of themselves, I offer to help them through the problem but make sure they still put the problem on the board. The problems are of varying difficulty, so each student should be able to complete at least one of them.

When creating worksheets, I tried to include problems with varying levels of difficulty. One worksheet where the problems were organized well was the practice sheet for Unit 2 Section 2 - Solving Inequalities with Multiplication or Division. All the problems covered the same types of content, but the odds had larger numbers, so they were naturally more difficult. I had the students start with the even problems to make sure they all grasped the new content. For those *that* (who) understood the material quickly, they could work on the odd problems for more of a challenge, but I knew there (were students who) *was students that* would not be able to complete all of the questions without a calculator. For homework that evening, they only had to work on the even problems, so the students who were at a lower level would still be able to finish the homework. The worksheet was developed using Kuta Infinite Algebra Software, provided by WRHS. View the worksheet [here](#).

## **Reflective Practice**

In terms of teaching, reflective practice requires teachers to think about the lessons, activities, and assessments they give and their effectiveness. Teachers can then use their reflections to improve upon their teaching as a whole, whether it be the types of activities they give, how they deliver lessons, or the length of the assessments. These reflections can be done individually or with the assistance of other colleagues (i.e. having a co-worker observe your class and deliberate afterwards). Reflective practice is critical to teaching because it is a main strategy for teacher improvement and developing individual instructional skill-set.

Throughout my practicum at WRHS, I consistently asked my supervising practitioner for feedback on lessons and aspects of my teaching that I needed to work on. Especially in the beginning, I wanted feedback about the pacing of the lessons and the tones of my voice. I have the tendency to talk in a monotone voice and very quickly. Like I suspected, when I first started, I spoke a little quickly and without a lot of emotion. Also, I would talk about different ways to give the material to the students after the first time I give a lesson (i.e. acronyms, graphic organizers, etc.). Each week, I would write reflections about a highlight and challenge of my week, a goal I have for the following week, and a self-evaluation about my goal from the previous week (see an example reflection [here](#)).

Another aspect of reflective teaching I completed during my practicum was giving my students a survey about various aspects of the class. I had the students give feedback on the pace of note taking, the types of notes, activities in class, and their own level of participation. The survey given can be found [here](#).

My CPA students also took the CAP Student Feedback Survey (Grades 6-12: Short Form). This had my students answer 20 questions on a four point Likert scale (Strongly Disagree, Disagree, Agree, and Strongly Agree). I had each class take the survey so I could analyze the data by section, as my different classes had different relationships with me at the time of the survey (some I had only taught for a week or two at the time). Read more about the survey and the responses [here](#).

## **My WPI Education**

My background going into teaching is a little more unusual than most; my undergraduate degree is in Architectural Engineering at WPI. I am also simultaneously working on a Masters degree in Fire Protection Engineering at WPI. Architectural Engineering focuses on applying engineering concepts to buildings and working to make designs more sustainable. Mainly, it is a combination of Architecture, Environmental Engineering, and Civil Engineering. Fire Protection Engineering focuses on applying engineering principles to fire safety (i.e. sprinkler designs, fire alarm designs, studying the flow of fires, etc).

I have completed many different projects related to Architectural Engineering and Fire Protection Engineering. I have designed numerous buildings, sprinkler systems, fire alarm systems, interior designs, as well as other project types. Each of these projects requires an extensive amount of math, especially Algebra. In my program requirements, I had to take eight courses in the Mathematical Sciences Department, three of which I completed in high school due to AP credit. These courses range from Calculus, Statistics, and Linear Algebra. The knowledge



I gained from my math classes as well as the projects I complete in school is what I need to know in order to teach my students at WRHS.

Besides the math content, my major also provides me with my different applications of math in the real world, especially with fires. Fire is a topic that is not discussed as much in schools, so applying math to fire peaks student interests slightly more than other more typical applications.

## **My Classes**

A Block was the third class (and final Algebra 1 CPA class) that I started teaching. I started teaching them in Week 7 of my practicum. The class, although the smallest of the Algebra 1 CPA classes, contains many strong personalities. Most of the students are more outspoken, yet understand when they need to be quiet. For this reason, I have never had a big problem with classroom management. The class has entered a routine - during the do now, they are more talkative than my other classes, but this allows them to use some of their energy before activities such as notes. By allowing this, the students tend to be more focused during notes.

D Block was the last class that I started to teach; I started teaching them in Week 8. In the class, there are 11 students, eight of whom receive accommodations due to IEP or 504 plans. There is also a paraprofessional in the class to assist the students with their learning. I incorporate the accommodations from the students plans into my lessons as described in [Meeting Diverse Needs](#). When I first started teaching the class, Sam had allowed the students to listen to music while completing their classwork to help them focus. However, a couple of weeks after I started teaching them, Sam and I noticed that they became more distracted while listening to music. For this reason, we decided to change the class policy; no one was to listen to music during class time. After we made this change, the students became much more productive during class.

E Block was the second class that I started to teach. I started teaching them in Week 5, when they started Unit 2. This is the class that I had the most difficulty with management wise. There are a handful of students in the class that are often disruptive and talk while I am trying to give the students instruction or as I am writing notes on the board. This was one of my biggest challenges during my practicum. I discussed different discipline strategies numerous times with Sam. At first, I tried reminding the students of the classroom expectations but that was not successful. I then implemented a policy where students receive one warning about their behavior before receiving a morning detention. For some of the students that were more disruptive, this helped their behavior in class. However, some still could not control their actions in class. After speaking to one particular disruptive student about how we could work to improve his class behavior, he mentioned that they were waiting for a doctor to confirm that he had ADHD and medicate them. I was surprised when I heard this, and suggested the student try to always face forward in his seat and write down every part of the notes in an attempt to limit his distractions. The student is still working on improving his behavior in class.

F Block was the first class I taught, with my first day with them being in Week 3. Since I started teaching them so early in the year, both my students and I were nervous. I worried that I would not be a good teacher, whereas the students were still adjusting to high school. We all opened up to each other around the same time; as I became more comfortable in the classroom, so did they. Overall, F block was originally the lowest level CPA Class that Sam had. However, over the

course of my practicum, they became one of the stronger classes, with higher averages on quizzes than the other two CPA classes. I believe it is because we developed a very good relationship, so the students were more comfortable asking questions when they were struggling. My other classes did not like to ask as many questions, so it was harder for me to tell what topics they were struggling with. Overall, I never had an issue with discipline with my F block class. Of course, there were a few times when they were more talkative, but it never became a large issue.

During my teaching practicum, I had the pleasure of participating in Parent's Night. Parent's Night at WRHS has two sessions: an afternoon (12pm-2pm) and an evening (6pm-8:30pm) session. Parents drop into their students' teachers classrooms for five minutes and can ask questions and discuss their children's strengths and weaknesses. Parent's Night occurred about a week before the end of quarter one, so parents had a chance to find out their children's grades before the end of the grading period and what could be done to improve grades. I was fortunate enough to meet the majority of my students' parents or guardians.

Most of the parents were curious to know their students' grades and if myself or Sam Cornwell (my mentor teacher) had any comments we would like to make about the student. However, there were a few parents who had more specific questions, especially if they knew their child were struggling. There were two students from Algebra I CPA that Sam and myself recommended to move down a level to Algebra I CP as we felt it would be a better pace for these students. Both students are still in Algebra I CPA and both of their parents discussed that possibility with us during Parent's Night. In both cases, the students felt as if they were in the right class and their parents said they would support either decision.

During Parent's Night, there were parents of students in Sam's other class, AP Statistics, which I do not teach. In that class, the students complete many group projects in which the students all receive the same grade. In the beginning of the year, the students struggled with how to divide the work evenly and work in a group. This was an area of concern for many parents. By sitting in on these meetings with Sam, I was able to learn how to handle situations like these through observation. Sam discussed with the parents that the students were still learning how to work in groups and she does take measures to ensure that each student is working on the project evenly. She also gave the parents helpful tips that they could pass on to their children while trying to help.

## **Conclusion**

Teachers have a large impact on their students. Besides teaching the subject matter, they usually help shape students' personalities. Often times, students are reminded of what it means to be respectful during class, and students tend to ask teachers for advice as well. This advice is not always content related. I have noticed this in my time at Wachusett. While students have asked me countless questions about math, they have also asked about other topics. For example, students have asked me about different life plans after high school, such as college, trade school, and the military. While I am a firm believer in that everyone should have the tools to go to college, I do not believe everyone needs to. I find that this can be an unpopular opinion in schools now. When students ask me about plans for after graduation, I explain to them that they do have the option to do whatever it is that they want, and if that is not college, that is okay. In

terms of school, I have learned first hand that the teacher can impact the students love for a subject. One of my students expressed that she hated math in the beginning of my practicum. However, towards the end, she told me that she really looked forward to my class and that I was one of her favorite teachers. It was one of the most memorable moments of my teaching experience.

While at the school, there was a teacher culture that I noticed. I was fortunate enough to have a desk in my mentor teacher's (Sam Cornwell) workroom where I could witness this first hand. The workroom had teachers from different subjects, including Math, Physics, and Special Education. I noticed that there was a lot of collaboration between the Physics and Math teachers. For example, during the Literal Equations section in Algebra, Sam borrowed the Physics reference sheet to create problems. This incorporated material from other classes to help the students see the connections between math and other subjects. Teachers need to consistently collaborate in order to provide diverse lessons for students.

Before starting my teaching practicum at Wachusett, I took psychology and teaching methods course to help prepare. The psychology courses allowed me to understand what students could handle, especially in regards to their attention span. Students cannot spend the entire 48 minute class time only doing one thing; lessons need to be broken up by different activities. I made sure to plan my lessons so different activities would be incorporated. In terms of my teaching methods courses, I learned how to make a formal lesson plan and create objectives based off standards. Lesson plans are a key element of teaching, so I am glad I learned the skill before starting my practicum. However, the one thing that I wish I learned more about in my teaching methods courses were the CAP Elements themselves. I think by learning more about them before entering the classroom, I could have implemented each of them in my teaching more quickly and more effectively.

Overall, my biggest growth throughout this practicum was my ability to multitask. In the beginning, I could only focus on one thing at a time. For example, if we were taking notes, I could only focus on the notes themselves and writing them correctly on the board. Now, I can write notes while talking with a student and possibly catching a diversion at the same time. It is a skill that I know will have a great impact on the rest of my career as a student and then as a teacher.