

Flip or Flop: What Happens When I Flip My Seventh Grade Science Classroom?

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I. Context of Study

I am in my seventh year of teaching, my fifth year of teaching in Middle School. I teach seventh grade life science in a brand new STEM lab. All of my desks are on wheels and students sit in small groups rather than rows. The room allows for more collaboration amongst my students. My district has provided its teachers with technology including multiple computer labs, Chrome book carts and teacher iPads. Students in Pequannock come mostly from upper middle class, Caucasian homes. They play sports, participate in school clubs, take music lessons and volunteer around town. Academics are a prime focus and most parents are involved in the school life of the students. Parents are in constant contact with teachers and administrator via email, the district website and telephone.

Time is so valuable. This is true in education now more than ever. New pressures are constantly emerging, from SGO pre and post-tests to the Common Core. I now have to implement more writing into the curriculum, along with non-fiction reading and reading comprehension. As a science teacher I am also preparing for the next generation science standards. This leaves less time for my actual science curriculum. The time crunch leads me to the question “What happens when I flip my classroom?” My hope is that by flipping lecture information to homework, I will free up more time within my class to accommodate all of the necessary activities being added to my current curriculum.

Flipping the classroom is not something new. I tried the flipped classroom once last school year at the suggestion of my principal. For that assignment, I had students play a game online about the carbon cycle. They took notes and brought them into class

to use on a five question, multiple-choice quiz. Of my ninety-three students, ninety-one students completed the assignment. Most students had a perfect quiz score. These statistics blew me away as up until this assignment, I had never had such a high percentage of participation on a homework assignment, nor such high homework scores. When I asked my students why this was, they said the assignment was fun. The homework was not just a boring worksheet, questions for the book or practice problems. I had given them an assignment they enjoyed to do. The enthusiasm they had for the assignment and the realization that the material counted for a quiz grade motivated them to take responsibility for the material; material I never taught in class.

In this current school year, my principal has asked the core teachers to implement the flipped classroom model in some capacity. While every lesson does not need to be flipped, we should aim to flip often and within each unit. Homework has become more of a burden to students, who are busy with sports, music and volunteer work. It is being done sporadically and with poor effort. This is frustrating to us as teachers because we rely on the homework for practice. It is affecting students' grades as well, bringing many averages down. Students do not see the value in most homework assignments and look at them as busy work rather than educational opportunities. Parents have expressed concern for the amount of homework going home, saying that the students are overwhelmed. They are also questioning the value of the homework assignments given, asking for fewer but more meaningful assignments. Therefore, our principal would like to see homework assignments become more of a self-discovery time for the students. This will allow class time to be freed up for more in-depth activities.

Since I was asked to implement the flipped classroom model consistently, it only made sense to make this my research project. What happens when I flip my classroom? How will the flipped classroom change my day-to-day life? What will my students think of the flipped classroom? In theory, the flipped classroom sounds perfect but from experience, I know that nothing works out as planned. It was a major change that greatly impacted my classroom, my students and my life.

How has the flipped classroom change my day-to-day life? Clearly, my instruction needed to change drastically to accommodate the flipped classroom model. I planned on flipping once per week. I no longer lectured on that day, and rather I put these notes on my website for students to read. I also supplied video clips and interactive websites for students to explore. I have been using my class time for more problem-solving activities and real-life application, which means I have been able to add more activities to my units, including problem-based learning

How did the flipped classroom impact me as a teacher? What time did this take? As many others teachers can echo, I am already strapped for time both in and out of my classroom. My preps are filled with meetings and administrative paperwork. My afternoons and evenings were consumed by grading and lesson plans. Would flipping the classroom completely stress me out? My biggest fear was not having enough time to effectively flip my classroom. The stress could also affect my teaching style. I have always been a happy, bubbly teacher. I did not want that to go away because I am too stressed out.

What would my students think of the flipped classroom? I had positive feedback on my flipped classroom attempt last school year. I am flipping with a new set of

students. Would they be as receptive? Would they enjoy the flipped notes, videos and activities that they needed to complete? In the end, if the students did not enjoy the flipped classroom experience, the lesson really could flop. Any students who did not come to class prepared would not be able to effectively participate in that day's activity or discussion. How would the flipped classroom work?

II. Review of Relevant Literature

A flipped classroom can take many forms and is as unique as each teacher. My goal was to see how other teachers have implemented a flip, the successes, the struggles and the hindsight. I was looking for ideas and inspiration for my own classroom. Through my research, I discovered five articles, each with its own perspective on the flipped classroom. There is no one-way to flip a classroom, but the common goal is to help students learn.

Mark Frydenberg: The Flipped Classroom: It's Got to Be Done Right

Technology must be the focus of the flipped classroom. While a reading can be helpful, and in some cases will be necessary, technology will engage the students. When they enjoy the homework, they are more motivated to learn. This will lead to a more productive class period. The flipped classroom has students taking control of the learning, in order to do that, they must connect with it. The job as the educator is to become the “guide on the side.” The teacher must give up being the center of attention and find comfort watching from the sidelines. The flipped classroom is a student-centered classroom. The students will run the activities and discussions. The teacher must merely walk around, check in, and clarify topics for individuals or groups. This experience is meant to be a challenge to students, but is meant to prepare them for the real world, which is also starting to flip.

The focus of this article was planning. To effectively flip a classroom, the teacher must find and/or create engaging homework assignments that peak students' interest. This is the educator's primary job and usually involved the incorporation of technology.

If a student is not engaged in a lesson, whether it be inside or outside of school, learning will likely not occur.

The article lacked any application. I was looking for examples of how I could use the flipped classroom, or examples of how others have used it. I also do not completely agree with the idea of being a “guide on the side.” Even in a flipped classroom, students need direction. I teach middle school students. They need guidance, prompting and modeling. Maturity plays a large role in this, as does the make-up of each class. Once I get groups going, I can usually watch from the side and circulate. I also believe the activity needs to be debriefed. The article did not mention anything about what happens after the lesson occurs. This article did stress the importance of making the flipped homework assignment meaningful so students take ownership of it. No matter what assignment I choose to give to my students, I keep this in mind and make it something that the students will gravitate towards.

The Flipped Mobile Classroom: Learning "Upside Down" | Edutopia

This article was an overview on the concept of the flipped classroom. It supplied example of how the implement a flip into core courses. One of the misconceptions about the flipped classroom is that only video clips can be used. While video clips can be extremely useful, there are other media outlets that can be used. These include podcasts, interactive websites and readings. The key is to select various forms of media to reach and support all learners.

The flipped classroom can be very useful in a science classroom. Rather than taking class time to explain lab procedures, the teacher can video record himself or

herself doing a demo of the lab. Students will be asked to watch the video clip and read the lab prior to coming in. When they come to class, they will have a few minutes to ask clarifying questions and then get into the lab. It saves classroom time for more lab time and forces students to take on the responsibility for themselves. If they do not complete the assignment, they cannot participate in the lab activity.

Can I set up a place online for my students to collaborate on the flipped classroom? One of the advantages of the flipped classroom is that students learn at their own pace and in their own way. What if they are an interpersonal learner? They would want to learn with others. Also, some students struggle with learning and would like to discuss the material prior to entering the classroom for large group discussion. Perhaps I can create a website where my students can view the video clips and have an online discussion or blog with each other. I can also get involved online if need be. The example of the science lab is perfect. If a student does not understand the directions and the video does not clarify it enough, the student can take to the discussion board to ask peers. They can help each other learn both in and outside of the classroom.

The Flipped Classroom

Online instruction at home frees class time for learning

“The ideas behind flipping are not brand new.” Technology is quickly moving into all aspects of teaching. Computers, Chromebooks and iPads are now a daily component of most classrooms. This means homework needs to change. No longer are students interested in the old textbooks. Technology is the main focus of the flipped classroom. They are more engaging and interactive than worksheets or textbooks.

The main purpose of the flipped classroom is to free up classroom time for more advanced learning. It also allows for more in-depth conversations, higher-level thinking, and more individual instruction between the teacher and the student. Another byproduct tends to be more student motivation. Since students know each homework assignment is followed by a short quiz, the grade itself is motivating. The activities are also motivating. In order to participate, you must have completed the homework.

The article brought up the fear of technology being an adversary to the teacher. Finding the materials was my biggest concern going into the flipped model. Many questions arose from this article as well. Where will I find videos and interactive websites? What if I cannot find them? Do I need to create a video? If so, how will I do it? Seeing how seamlessly the lesson went in the article made me hopeful my lessons could run the same way.

Students' Perceptions of Pre-class Video in the Flipped-Classroom Instructional

Model: A Survey Study

What do the student think about the flipped classroom? This is really the most important question. Educators can have brilliant ideas, but if the students do not latch onto it, the idea is futile. A research study was done on high school students to find out which type of flipped-classroom video they preferred to watch. There are three types of videos: movie videos, webinars and video lecture. The study asked students to watch a video clip prior to the lesson then complete a small quiz about the video that would be counted towards a grade. In class, the students participated in small group activities and discussions, both of which revolved around the new material.

Students completed an anonymous survey about themselves and the video experience. Questions included how they would rate the video, rate the helpfulness of the video, how many times they watched it. They were also asked to rank the types of videos in order of favorite. The idea was that if students like the video and can connect with it, they will learn more from it. The results of the experiment showed that most students preferred the video lecture because it was easiest to follow and most helpful. It included the teacher talking and the notes for the class. The movie video was ranked second favorite. Students said they were useful yet often went quickly. There were no notes attached to it either. The webinar ranked last in that it lacked the visual component.

Knowing that there are various forms of pre-class videos is extremely helpful. My plan was to explore each of the three types during my planning of flipped classroom assignments. While the study showed that students preferred the video lecture, I cannot rule out the others. This study included one group of high school students. It may not be a fair representation of my middle school students. I also need to reach all of my learners. While some of my students may have appreciated the video lecture, others may have liked the movie video off of YouTube.

The Use of a Flipped Classroom to Enhance Engagement and Promote Active Learning

The purpose of the flipped classroom is to help the students. In this research study, student engagement was studied. Behavioral, emotional, cognitive and agentic engagement were all measured quantitatively. Students were asked to complete a survey based on his or her individual feelings towards the flipped classroom homework and class

activities. A survey was used, which included a seven-point Likert scale. Seven represented strongly disagree and one was strongly agree. Sample questions included “When I’m in class, I participate in class discussion.”

Students were most engaged emotionally. If the student is connected to the learning, they will retain it. The flipped classroom helps to make that emotional connection. The homework is meant to entertain and enlighten. When someone is entertained, the emotions get involved and a connection is made. Agentic engagement, or self-learning, is ranked lowest.

How does a teacher engage students? The video alone may not be enough. The article brought up the fact that students may not understand the material despite the video. The article also helped me to understand that I cannot expect my middle school students to make many major connections outside of the classroom. I need to make those connections through the classroom activities. Technology could also interfere with the learning process. If a video or website does not work, it may frustrate students and actually turn them off to the homework and the material all together.

I greatly enjoyed seeing the sample student survey questions. Since I had planned on gathering student input throughout my project, it was helpful to see the application of a Likert scale and the wording of the survey questions. I, too, asked students about personal feelings towards the flipped classroom, which included what worked and what did not work. While this study was done with undergraduate students, I was able to use it as a starting point for my middle school students.

III. Methodology

My research revolves around my seventh grade life science students. They are twelve and thirteen-year-olds and this is the second year they are in middle school. I have eighty-three students total, but have chosen to focus my data collection on one class. This class has twenty-four students, twelve boys and twelve girls. They are a mix of musicians, athletes, honors students and struggling students. It is a diverse group that represents the seventh grade as a whole. I have this group late morning and behavior is not an issue.

Data can come in many forms. Being a scientist, that usually means quantitative data. For my research, however, I collected qualitative data. I wanted to know how my students felt and how they were enjoying the homework. Also, was the homework helpful to them? Which type of flipped classroom homework did they prefer: notes, video or websites? To acquire the students' perspectives, I needed to get student feedback on each type of flipped homework assignment.

Student opinions are valued throughout the school year. My goal was to have students complete a survey at the end of each week regarding the flipped classroom homework from that week. Questions were geared towards how students were completing the homework and if they found the flipped homework to be helpful. My survey contained a Likert scale with Strongly Agree, Agree, Disagree, and Strongly Disagree. It also contained a "check all that apply" question, and some short responses. The "check all that apply" provided me with some insight into how students were completing the assignment. Were they taking notes or discussing the assignment? Did they re-watch video clips? The short responses focused on what students liked and did

not like about the particular homework assignment. It also provided my students with an option to give feedback and advice to improve future flipped homework assignments.

(Appendix D)

Part of learning is learning about you. Much of my data about myself came from journaling. I reflected on what I had accomplished, what went well, what needed to be improved and how I was feeling. Flipping the classroom required more time, so how would I handle the added stress? I wrote in my journal two days a week. I always wrote on the day the flipped homework assignment was due. I wanted to reflect on how many students completed the assignment, the overall student engagement during the classroom activity, and the success of the activity that day in class. The second day I wrote on was Friday. I wrote about how my week went overall, my stress level, the progression of my unit, and my reaction to reading the surveys. During weeks that I did not have a flipped homework assignment, I tried to journal on Tuesday or Wednesday about how students were progressing with the material. Friday writing still focused on overall reflection.

At the conclusion of my research, I have many pieces of data. Students have four surveys following a flipped homework assignment and flipped lesson. I have sixteen journal entries as well. I kept the surveys by type of homework: video clip, guided reading, interactive websites, and web quest. Each level of the Likert scale received a number. Strongly Agree received a four, Agree received a three, Disagree received a two and Strongly Disagree received a one. I tallied up how many of each response I had and input the data into Excel. This provided me with a table for each question on my survey. Taking data from all four activities, I compiled one large data table, which I used to create a bar graph.

My sixteen journal entries were meant to provide insight into my own mindset and feelings towards the flipped homework assignments, from creating each to observing my students using the information. With my journals, I went back and read each one. I then re-read them looking for themes. On my final read through, I highlighted and found two key themes: uncertainty and frustration.

From my data, I expected to gain a fresh perspective from my students regarding various types of assignments. I expected to read about concerns, accomplishments, complaints and praise. For myself, I expected to gain insight into my own thoughts, find where they were coming from and how to deal with them. Change is not easy, but data would help guide the way.

IV. Findings

What will my students think of the flipped classroom?

Engagement is key in the learning process. I wanted know which type of flipped homework assignment my students enjoyed the most. I also wanted to discover which assignment would lead to better student understanding of the new material. During my research, I tried four different types of homework assignments with my students: a YouTube video clip, a guided reading, interactive websites and a web quest. Each assignment was followed by a multiple-choice quiz at the beginning of class. This held students accountable for the information as well as laid the groundwork for a classroom activity. At the conclusion on the class activity, I had students complete an anonymous survey.

<p>Homework: YouTube Video Clip on the Light Microscope</p> <p>Activity: Lab experiment using the microscope</p>	<p>Homework: Guided Reading Using Textbook on the Needs of Living Organisms</p> <p>Activity: Debate about the robot “Kismit”</p>
<p>Homework: Interactive Websites on The Animal Cell</p> <p>Activity: Create a cell analogy (project)</p>	<p>Homework: Web Quest on the Processes of Photosynthesis and Cellular Respiration</p> <p>Activity: Create a postcard (project)</p>

Type 1: YouTube video clip

The first assignment I gave was a YouTube video clip on the topic of the light microscope. Most teachers, myself included, think of video clips when you mention a flipped classroom. Video clips offer a variation of the lecture, often using music and visuals not readily available in the classroom. I had found a clip on YouTube about the light microscope that walked students through the parts of the microscope and how to use it. On the day the assignment was due, I had students use the information and the microscope to view various slides. In the past, I have demonstrated using a light microscope along with a PowerPoint prior to allowing students to use the microscope. In a class that averages twenty-four students, it is difficult for all students to see the pieces I am pointing to or to see the Smart Board. The video provided the opportunity to stop and replay the material. One student commented, “I liked that I could go at my own pace.”

	Strongly Agree	Agree	Disagree	Strongly Disagree	N
I found the homework assignment helped me	13 (56.16%)	11 (45.83%)			24
I felt confident during the class.	18 (75%)	6 (25%)			24
I prefer the homework to a lecture.	9 (37.5%)	11 (45.83%)	3 (12.5%)	1 (4.16%)	24

For the first two questions, all of my students agreed or strongly agreed that the video clip was helpful and that they felt confident with the material during the lab

activity. Surprisingly, however, four students would have preferred a standard lecture rather than the video clip. This means that even though these students enjoyed the process of watching a video clip and felt confident with the material, they would have liked a lecture on the material. One student wrote, “It was tough to figure out what to write down.” This was the first flipped homework they were exposed to. Perhaps these students were nervous about getting the information correct or lacked the confidence in himself or herself to gather the proper information. At this age, students are also very concrete. They want to know exactly what it is they need to know, what is important and what is not.

Type 2: Guided Reading

The second assignment I gave was a guided reading. Students were given a handout and asked to complete it using the textbook. The material covered the basic needs of living organisms, material that some students saw in elementary school. The assignment encompassed six pages within the textbook, and asked students to copy definitions, to answer questions, and to complete a chart. On the day the assignment was due, students used the completed worksheet to enter into a debate about whether or not a robot named “Kismit” was alive or not. The homework assignment did not incorporate any technology, unless students accessed the digital copy of the textbook. A guided reading is something students are more familiar with from other classes. Flipped assignments do not need to incorporate technology, but it is often utilized to increase engagement.

	Strongly Agree	Agree	Disagree	Strongly Disagree	N
I found the homework assignment helped me	14 (58.3%)	10 (41.67%)			24
I felt confident during the class.	15 (62.5%)	9 (37.5%)			24
I prefer the homework to a lecture.	10 (41.67%)	11 (45.83%)	2 (8.3%)	1 (4.16%)	24

All students found the assignment helpful and felt confident to use this information on the class debate. I find it interesting that three students still preferred a lecture rather than this homework. One student checked off “strongly disagree” to the statement that they preferred this assignment to a lecture. These results are similar to the YouTube clip. I have to wonder why that student would have preferred a lecture. Was the textbook boring? Is this student more of an auditory learner as compared to a visual or linguistic learner?

Type 3: Interactive Websites

When teaching the cell, the concept is very abstract. Students are not able to see all of the pieces that make up the cell and must rely on artist renditions. This is where technology plays a vital role. Many resources exist, including interactive websites. These websites allow students to click on pieces of the cell to get a definition, play games

and manipulate the cell using three-dimensional innovation. It is the closest they can get to actually viewing the inside of a cell. To help students even further, students used the information on the parts of the cell to create his or her own cell analogy, such as a cell city, a cell water park or a cell school.

	Strongly Agree	Agree	Disagree	Strongly Disagree	N
I found the homework assignment helped me	13 (54.16%)	10 (41.6%)	1 (4.2%)		24
I felt confident during the class.	13 (54.16%)	8 (33.3%)	2 (8.3%)	1 (4.2%)	24
I prefer the homework to a lecture.	12 (50%)	9 (37.5%)	2 (8.3%)	1 (4.2%)	24

Ninety-six percent, or twenty-three out of twenty-four of my students found the websites to be helpful. Twenty-one out of twenty-four students felt confident with the parts of the cell after visiting the various websites. Twenty-one out of twenty-four of my students preferred the websites compared to a typical lecture. One student wrote, “I liked not having to read a book and getting to watch a video on the website.” Similarly to the YouTube video and the guided reading, there are still students, three in this case, who prefer to have a lecture rather than completing a flipped classroom. One student did not feel comfortable with the material, which is discouraging. He or she went into a project without a solid grasp on the material involved within the project. This may have been the same student who would have preferred a lecture rather than the flipped assignment. One

student did not find the assignment helpful, which is also concerning. This material was much more abstract and complex. Clearly, this flip was not as popular, and therefore not as successful, as the prior two assignments given. I now much wonder what I could have done differently to help these students find the homework helpful and feel confident.

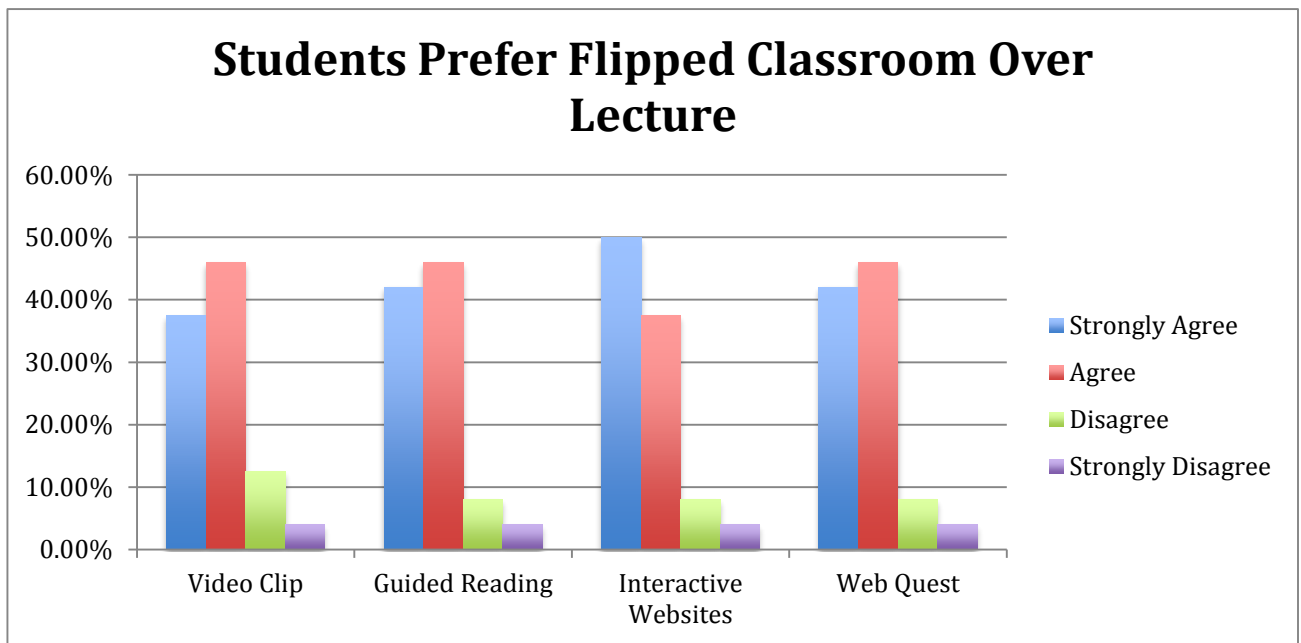
Type 4: Web quest

Unlike the interactive websites, a web quest does not necessarily incorporate interactive websites. It is a compilation of many informational websites that students go to, read, watch and explore. Each website included specific questions that needed to be answered and sketches that needed to be drawn. For photosynthesis and cellular respiration, the websites in the web quest allowed students to follow molecules of matter as they traveled through a plant and had them read about how the atmosphere is helped by the process. Students then took this information to create an informational postcard.

	Strongly Agree	Agree	Disagree	Strongly Disagree	N
I found the homework assignment helped me	14 (58.3%)	8 (33.3%)		2 (8.3%)	24
I felt confident during the class.	14 (58.3%)	6 (25%)	2 (8.3%)	2 (8.2%)	24
I prefer the homework to a lecture.	10 (41.6%)	11 (45.83%)	2 (8.3%)	1 (4.2%)	24

Twenty-two students found the web quest helpful and felt confident with the material. Four of my students did not feel comfortable with the material in class and three of them would have preferred a lecture rather than the homework. Much like with the previous flipped assignments, these students would rather have notes than be responsible for the material independently. This assignment had the highest level of students who did not find the assignment helpful. Why? What could have been changed about this assignment to make it more helpful? These concepts are the most abstract and complex to date. This may have been a factor and may also explain why four students did not feel confident with the material when they started the project.

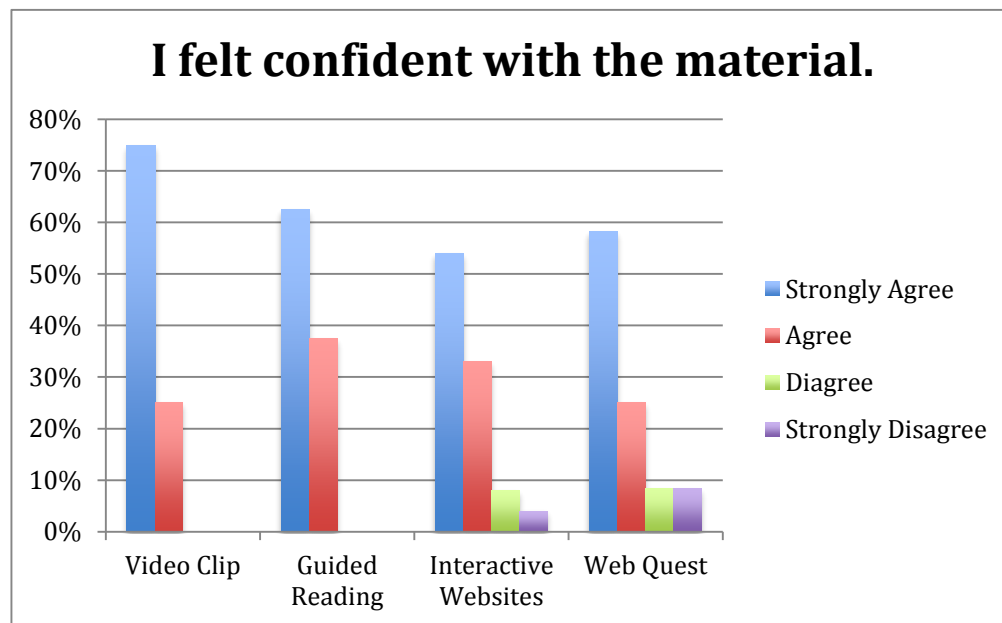
Overall Student Feedback



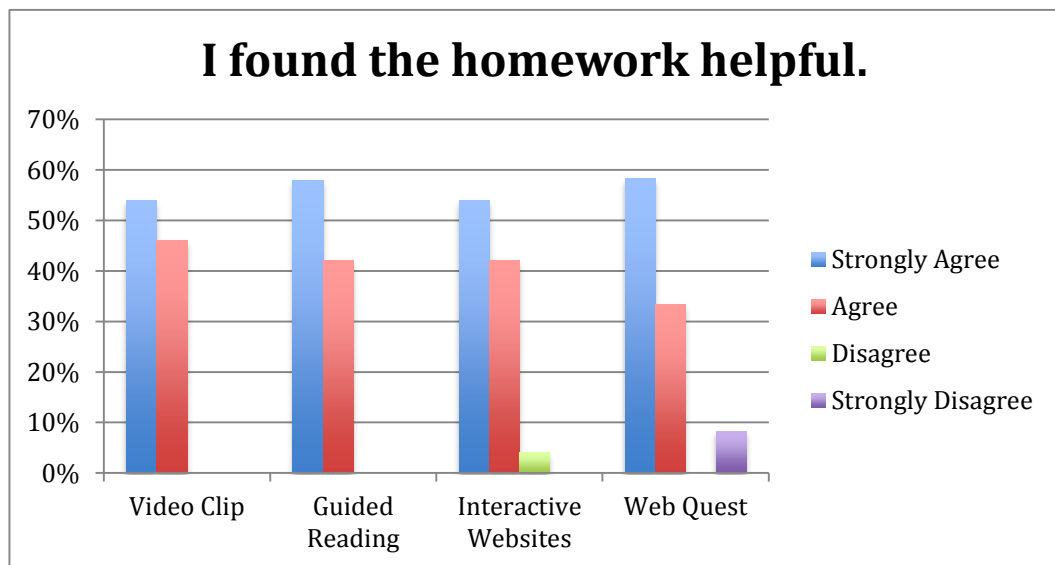
Based on the chart above, eighty-six percent of my students preferred a flipped homework assignment to a traditional lecture. The interactive websites appear to be the most popular, having the most amount of “strongly agree” responses. Students spend

quite a large amount of time on the Internet. The sites I provided were animated and engaging, even including games. Clearly, these sites appealed to my students. One student wrote, “I liked that it gave us time and gave us choices on how to find the answers.”

As the activities progressed, fewer students answered, “disagree”. The green bar line steadily declines from the first activity onward. The “strongly disagree” bar remained constant throughout each assignment. The students who would have preferred lecture, therefore, diminished. The video clip had the most students who did not prefer the homework to the lecture. Being this was the first assignment, this could be attributed to nerves or uncertainty with the new process. I also need to take a look at the video I provided. Students commented, “The video was boring” and “The narrator’s voice was dull”. The quotes from my students show that while the video was informational, it was not entertaining. I may need to find a newer, more engaging video clip.



Looking at this chart for all of the assignments, ninety-three percent of students felt confident with the new material. This means they were able to come to class and use the material, along with the assignment notes, to move forward into debates, labs and projects. The number of “strongly agree” decreased over the first three activities. Students went from feeling strongly confident to moderately confident with the material. The number of “disagree” and “strongly disagree” rose, appearing in the last two assignments. This can be attributed to the increasing complexity of the material. The parts of the cell and photosynthesis are both complex, abstract concepts students have not been exposed to in prior grade levels. Being there was more information, students were not as comfortable coming to class with all of that knowledge. What can I do to help them with this? Can I provide notes on my website to help them focus on key concepts? Can I run a class blog where students can discuss the new material? These are all options for future assignments, and for next year.



As a teacher, my job is to reach every learner. Ninety-seven percent of my students found the flipped classroom homework helpful. This meant the assignments helped them to complete the graded quiz and the subsequent classroom activity. Throughout the assignments, the number of students who strongly agreed the homework assignment was helpful remained relatively constant, peaking with the web quest. The number of students who agreed the homework assignments was helpful declined over the course of the four assignments. At the same time, the number of “disagree” rose, followed by the number of “strongly disagree”. Much like the question about confidence, this could be attributed to increasing complexity in material. While the assignments were providing information, it may not have been enough for students to have a firm grasp on it.

The interactive websites encompassed the topic of the cell, and the web quest revolved around photosynthesis and cellular respiration, which are two very difficult concepts for a middle school student to comprehend. If these assignments were not helpful, I have concerns that this student may have been behind the other students or worse, completely lost during the unit. I stress extra help in the mornings if students have difficulty with the homework, and no one from this class came in. Is it possible this student just did not need the homework assignment? Perhaps they found the information easy. More than likely, these students could be more of an auditory or kinesthetic learner so the websites and web quest sites may not have been engaging enough to be helpful. Lastly, the information could have been overwhelming to them. They may have needed more guidance within the assignment, such as chunking. Most likely, these are

the same students who did not feel confident with the material and would have preferred a lecture instead, and who said, “I didn’t like how we didn’t discuss the topic in class.”

How will the flipped classroom impact me as a teacher?

The process of flipping the classroom is not only an adjustment for my students; it is a major adjustment for me as a teacher. Throughout my entire teaching career, I have taught new material via a lecture. My PowerPoint presentations have been developed and refined, including interactive graphics and vibrant colors. Giving all of it up was not only scary, it was sad. I needed to have a lot of trust in my students, that they would learn the new material without me walking them through it step by step. Looking back at my journal entries, I found two main themes, two main emotions that flooded my experience: uncertainty and frustration.

Trying something new is always nerve-wracking. It began with my planning and this journal entry, “My cooperating teacher is following along, but she doesn’t seem thrilled. I’m nervous if this doesn’t work, she’ll resent me.” Not only was I changing my classroom, I was changing the entire seventh-grade. The planning process in itself was scary. I spent many hours searching for video clips, websites, and handouts. I found there are many sources available to teachers for a flipped classroom. Entire websites are devoted to video clips that vary in content and age level. This made my planning much simpler.

My nerves continued to rattle at the realization that I was giving up complete control to my students. Every flipped homework assignment I gave, I was constantly

questioning if it would work, if it were the best possible activity, if students would learn from it, and if the students would enjoy it. If flipping the classroom failed, my students would suffer greatly. I would lose a considerable amount of class time re-teaching what they should have learned in the homework. Students would resent my homework assignments, jeopardizing every homework assignment for the remainder of the year. As the project progressed over the eight weeks, my nerves dissipated. I found that students were completing the assignments and were learning the basic information needed to be successful in class. This led to my second emotion: frustration.

When assigning homework, I expect my students to give it one-hundred-percent effort. I found throughout my project that while students were completing the homework, they were not all fully understanding the material. They also did not seem to show any interest in understanding it. I overheard, "I did the homework, but I don't get it." Clearly, they did not see the value in the material and did not have a vested interest. Students were able to complete the graded quiz with much success. When it came to applying the knowledge to an activity, such as a project or lab, the students were struggling more than in past year. I wrote, "Students are not using the vocabulary correctly. They are not using their homework notes! They have all of the information but aren't using it! I have been answering questions to each group and I wonder if I should have just given notes first." This entry captures my observations of my students during the microscope lab that immediately followed the YouTube video clip microscope homework. Much like the nerves, the frustration faded away. I could not expect my students to become experts on the material on their own. If that were the case, I would not have a job. Instead, they had a foundation I could build off. Sure, I had to answer

more questions, but they were asking the questions. They wanted to understand what they had seen in the video, in the book, and on the websites.

What happens when I flip my classroom? The purpose of this research was to help my students and improve my classroom. At the end of the day, that is why I do everything I do. My students are my number one priority and anything I can do to help them I will do. Through my research I have found that overall, my students enjoyed and learned through the flipped classroom. They felt confident with the new material and were able to successfully navigate classroom activities using the new information. Most students preferred the flipped homework compared to a traditional lecture. For myself, I found that process was scary and unsettling, but worthwhile.

V. Implications

What happens when I flip my classroom? I sent my students home with a homework assignment that revolved around new material. Trust was instilled that they would come to class with a degree of mastery of this material. After eight weeks of research, four flipped classroom assignments, four sets of surveys and sixteen journal entries, I have a clear answer: learning. When I flipped my classroom, my students enjoyed the learning process and were able to find success.

The flipped classroom put the responsibility of learning onto the students. No longer could they just sit back and listen. They were now actively facilitating their own learning, taking in the new information at his and her own pace. Based on what I have observed within the classroom and from student feedback, this change was positive. One student wrote, “I like that is (the homework) was graded. I had a better work motive.” The students enjoyed being able to explore the new material at various paces. “I liked being able to stop when I wanted to and not having to take notes all together as a class.”

Though my students had difficulties, I will continue to utilize the flipped classroom. Many of my students found the homework assignments to be entertaining and informational. The students were able to come to class with some knowledge. The knowledge may not have been at the depth that I originally desired, but it was still something. This means that I do not need to lecture as much or at all. I have freed up

class time to incorporate new and in-depth activities where students can utilize this new knowledge.

Practice makes perfect. As the school year progresses students should become more comfortable with the flipped homework assignments. This means, with each assignment, students should continue to improve on the open-note warm ups and within the flipped activities. They will be able to better focus on the main idea and take accurate notes from the assignment. Ideally, the time the flipped homework takes to complete should decrease.

I found through my journals that my perception and expectations were different from the students' performance. I expected them to become experts in the material and come to class pouring this new knowledge out with enthusiasm. "They got to struggle with the material in a way that challenged them. And when they were done, they had a story to tell." (Frydenberg). I did not fully comprehend that my students needed to struggle, that the struggle was part of the process. This is a natural part of the learning process. Looking back at my journals, the struggle was the fuel of my frustration. Now I see that frustration was unwarranted and unnecessary. Students came to class with some information, and through my small group discussions, discussions with each other and in-class activities, connections were made.

VI. Limitations

At the beginning of this project, I had great aspirations. Originally, I wanted to flip my classroom each week, resulting in at least eight flipped assignments during the course of my project. In the end, I ended up with half of that data. Reality set in and the first issue was time. The second issue I faced was the placement of flipped activities within the curriculum.

Flipping the classroom takes time. First, I had to create the homework assignment. For my first flip, I had used Ted Ed and provided students with a video clip and a list of resourceful websites. I created a guided reading worksheet for my second flip in which students used the textbook. For my third flip, I compiled a list of interactive cell websites. Lastly, I created a web quest that included several informational web sites on photosynthesis and cellular respiration. Each of these activities required that I take several hours of my time. My assignments had to address the correct standards, be at the proper grade level and be able to be completed within a reasonable time frame. On top of all of that, I had to ensure that each assignment was engaging enough to catch my students' attention. After creating each activity, I then completed it from the perspective of my students to ensure accuracy and a proper time frame.

A flipped classroom is meant to teach new material to students outside of the classroom rather than teaching it within the lesson. I found quickly that I was not

teaching new material each week, so a flipped homework was not justified. With the new science standards and the Common Core, we are expected to cover less material but in more depth. For example, this project took place during the cell unit. This unit takes approximately four weeks to complete, during which time students are working with the material in various ways. There was no need to flip because there was no new information being presented. Had I been teaching a different unit, such as genetics, where new material is constantly being introduced, more flipped homework assignments would have been warranted.

VII. Emerging Questions

What else can I utilize within the flipped classroom? I have provided my students with a variety of flipped homework assignments. We have explored video clips, interactive websites, web quests, and textbook pages with worksheets. Each activity had its own pros and cons. Since I will be continuing to implement the flipped classroom throughout the remainder of the school year, I would like to explore a greater variety of activities to help students learn outside of the classroom. Students have unprecedented accesses to technology, especially within my school district. Many students also have smart phones and tablets. How can I implement these into the flipped homework?

How else can I make students excited for the knowledge to be gained in the flipped homework assignment? One of the most challenging aspects of the flipped classroom has been getting students to care about the new material. To ensure they complete the assignment, I have been giving my students a short graded quiz at the beginning of class using the completed assignment. I have found that students have the assignment completed, but do not fully understand the material. “I did it, but I don’t really get it.” At that point, I was forced to ask myself why I was doing this. While I cannot expect perfection, I would like students to be more engaged with the material. How can I do this?

Lastly, the question I now have is how can I make my students more accountable for the new material in the flipped homework? Aside from a quiz, is there something else I can do or give to encourage my students to complete and comprehend the assignment? One of the most important aspects of the flipped classroom is keeping students accountable for the information. Most students are not intrinsically motivated, which means I need to externally motivate them. The quizzes were helpful, but I would like to offer a variety of other assessments to my students. After the start of my research, Chromebooks were purchased for each student in preparation for new state testing. I now have access to these Chromebooks each and every day within my classroom. How can I incorporate this new technology into my flipped classroom activities to help my students further explore the content?

VIII. Conclusion

What happens when I flip my classroom? The flipped classroom is up and coming. While research has touched upon student opinions and involvement, I do not believe enough has been studied. Students have not been exposed to assignments like these, nor have they been trained in how to utilize them. My objective was to gather student opinion and observe how the flipped classroom affected my students' educational process. I was also looking to gather the teacher perspective on this new journey.

I have discovered that the majority of my students favor learning information at home, on his or her own terms and at his or her own pace. They preferred this compared to a typical lecture where I would simply provide notes via the SmartBoard. Whether it was a video clip, a guided reading, interactive websites, or a web quest, students enjoyed completing the assignments and felt confident enough with the new material to move forward into projects and lab activities. Students had a positive reaction and reception to the flipped homework and flipped activities.

Through my journaling, I have pieced together an accurate teacher perspective of the flipped classroom. I can summarize it by saying it was a bag of mixed emotions. Flipping the classroom was daunting, stressful, downright frustrating. The process took time to create and develop. I was required to give up control of my classroom to an

extent, having faith that my students would come to class with the new knowledge so we could proceed forward into activities. This happened and my students not only enjoyed the process, they succeeded in it. They were able to learn from the flipped homework and were able to apply this new knowledge to whatever activity they were given. In the end, I can honestly say it was all worth it.

Appendix A: Implementation

Good news must be shared. Now that I have completed my research, I plan on sharing this with my colleagues. I am fortunate enough to meet with my fellow seventh grade team teachers every day in a professional learning community, or PLC. We are able to discuss students and strategies regularly. Sharing my findings with my team is easy since I have so many opportunities. They would benefit the information the most since they have the same students as I do. If we all assign the same type of homework, it will increase consistency and therefore help the students become more comfortable with flipped homework assignments.

The flipped classroom is not limited to my students. Within my district, we are provided the opportunity to meet with our department once per month during meeting time. This means I meet with my fellow science teachers to discuss curriculum and teaching strategies. I would like to see the flipped classroom implemented in the sixth grade. This would mean next year, my students would have experience with flipped classroom homework assignments. There would not be a learning curve and I would likely see more success on the earlier flipped assessments.

For myself, the flipped classroom has provided the opportunity to incorporate more and more integrate activities. I have not had to spend time giving notes since

students have the information. I can take just a few minutes to go over the material, answer questions, or allow students to discuss the material in small groups. We then go into an activity, such as a project or lab. Being able to flip has opened up time within my curriculum to add new activities and lab that I have not had time for in the past.

Lastly, this project has given me the opportunity to reflect on my teaching. The concept of journaling has been one I have utilized in the past, but never within my teaching. Having somewhere to vent my feelings, thoughts and frustrations has allowed me to de-stress. While my journal entries are filled with anxiety, nerves and anger, I find myself more relaxed within class. I am no longer holding these feelings in. I have found a safe outlet to let those feelings out, which in turn, has made me much more relaxed, which is why I will continue to utilize a journal.

Appendix B: Subjectivity

There is always a little bit of me in every lesson. My homework is no exception. I feel I have influenced the homework assignments. I planned each homework assignment with the question of “would I enjoy doing this?” While that may sound selfish, it was not my intention. My intention was to put myself into the role of the student. With any assignment, I want my students to enjoy the process. If they enjoy the process, they are more likely to learn from it. With each flipped homework and flipped classroom assignment, I strived to make it something that my students would enjoy while still learning.

Making the surveys anonymous each time allowed my students to be as honest as possible. Had I asked for names, the answers may have been skewed to reflect what students wanted me to know rather than the truth. I still have to wonder if students were completely honest in the surveys. Were some students still checking off that the assignment was great just to make me happy? Did they feel that is what I wanted to see? I gave them the best opportunity to express opinion without fear of scrutiny.

My journals had to be all about me, and the themes within them were exactly what I expected to find. They are themes most teachers are feeling in the field. Each and every teacher is met with some uncertainty as new strategies are used, new curriculum is implemented and new procedures are put into place. Even a new school year brings a

degree of uncertainty about the dynamic of the class. I would be lying if I said I was surprised to find that theme within my writing. The theme of frustration has boiled to surface much more frequently in the field. With changes coming down the national, state and district level, the job has become much more cumbersome. The new expectations of educators have put a strain on each and every teacher, myself included. My fuse is shorter than it has ever been, and seeing myself mentally explode on paper was quite expected.

Appendix C: Impact on Students' Learning

To truly know how a flipped classroom affects the students, I have to look at numbers. Education has become all about numbers. From test scores to IQ scores, NJASK scores to SGO percentiles, numbers are becoming the only factor educators are responsible for. For my project, I chose not to look at scores. For the first time, I wanted to just look at my students, how they were progressing and how they were feeling.

I found that students enjoyed being treated like adults. They enjoyed the idea that they were responsible for the material rather than just memorizing and regurgitating. Despite my reservations, students were able to rise to the occasion and take ownership of the learning process. They were able to come to class with new knowledge and the ability to apply that knowledge. They utilized the new information to debate, experiment and create.

Holding my students accountable for the material increased motivation. Ultimately, this is still extrinsic motivation. As time progresses, I would like this to become intrinsic. All educators want their students to want to learn. For my particular age group, I believe that comes with maturity. Some students already have this natural drive to learn and achieve. Others are comfortable with mediocrity. Still other students lack motivation, failing to see a point in the information they find.

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Appendix D

Homework Feedback

During the homework assignment, you: *(check all that apply)*

- _____ Take notes
- _____ Stopped the video when needed
- _____ Wrote down questions you had to bring to class
- _____ Paid 100% attention to the video with no distraction
- _____ Discussed the video with a classmate before class

	Strongly Agree	Agree	Disagree	Strongly Disagree
I found the homework assignment helpful.				
I felt confident during class about the material from the homework.				
I enjoyed the homework assignment over typical lecture				

How long did you spend on the homework this week? _____

What did you like most about the homework. Be specific.

What didn't you like about the homework? Be specific.
