A Transition to Flipped Learning: The Oakfield Experience

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A Transition to Flipped Learning:
The Oakfield Experience

David R. Porter
Spring 2017
Advisor: Dr. Peter Veronesi
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Chapter One: INTRODUCTION

Advances in technology over the past decades have led to increased usage of technology among school aged youth. With increases in popularity of social media networks such as Facebook, Twitter and Instagram, there is an increased demand by some teachers to meet the students where they are, online. Students are found using the internet to stay in touch with friends, and to conduct personal research on an as needed basis; with this in mind, some teachers believe the internet is where they can best meet and engage their students. The following section discusses what flipped learning is, and why it should be implemented into classrooms.

What is Flipped Learning?

The idea of the flipped classroom has been around since Jonathan Bergmann and Aaron Sams pioneered the idea in the 2006 – 2007 school year. Bergmann and Sams had no previous research to base their flipped classroom model because they are the credited pioneers of this teaching and learning style. The development of the flipped classroom was birthed by necessity because many of their students were absent for multiple reasons on a regular basis. This encouraged Bergmann and Sams to be open and accessible to the students, but not always in real time.

Bergmann and Sams (2014), as well as many other authors, define the flipped classroom as a teaching and learning style where traditional in class activities happen at home, such as lectures and readings, and traditional at home activities are completed in the classroom, such as practice problem sets, and projects. The Flipped Learning Network (2014) defines flipped learning as more of a shift in where the different stages of learning take place. The Flipped
Learning Network describes the idea of the flipped classroom as a transition where the direct instruction moves from the group space or classroom, to the individual space, typically the home. By moving typical group space activities to the individual space, the group space can then be transformed and used for dynamic, active and differentiated learning by the students. The role of the instructor also transitions from educator to facilitator, having time to work in small groups, one on one with students, and build meaningful, lasting relationships with the students. Using a combination of the previous definitions, for the remainder of this paper, flipped learning will be defined as the teaching and learning style in which the typical classroom activities, such as lecturing and note taking, are moved from the group space to the individual space, allowing the instructor to facilitate learning in the new group space that utilizes active and differentiated learning. In contrast, for the remainder of this paper, the traditional classroom style will be defined as the teaching and learning style where the dissemination of information takes place in the classroom, and the application and practice of the learning takes place at home in the form of homework, practice problems, and/or readings.

In flipped learning, students typically watch a pre-recorded video of a lecture given by the teacher, on their own time. Compared to a traditional classroom setting where the teacher uses class time to lecture. Students are using low level thinking skills while copying notes from the given media source, be it the teacher or a pre-recorded video. In the traditional setting, students take home practice sets of problems asking the students to apply what they learned in class, a higher level thinking skill, where they often encounter difficulty, leading to frustration. Compared to the flipped classroom style where the student has completed the lower level thinking skill on their own time, which allows the teacher to plan higher level thinking skills to
occupy class time (Honeycutt and Garrett, 2014). Not only can the teacher plan higher level thinking activities, the teacher is also able to assist students in their work when the application of the content becomes difficult and frustrating.

**Why Utilize Flipped Learning?**

The driving question that led Bergmann and Sams (2014) to continue to develop the flipped learning model jested at the idea of what was the most important way to spend time with students within the classroom. In a traditional style classroom, the teacher stands at the front of the class and lectures for forty minutes, while students write the notes that are presented on the board, usually via power point. With only forty minutes per day with students, is the traditional style classroom the best use of time for the teacher? Is the traditional classroom the best use of time for the student? Many educators will agree the best use of time in the classroom is for students to get involved in their learning, reach higher levels of Bloom's taxonomy, to get more in depth with the content and to get involved in their learning. The flipped classroom is meant to be a learner (student) centered environment as opposed to the traditional teacher centered environment (Estes, Ingram and Liu, 2014).

**Chapter Two: Literature Review**

**FOUR PILLARS OF FLIPPED LEARNING**

The Flipped Learning Network (FLN) (2014) suggests there are four main pedagogical pillars that support flipped learning; Flexible Environment, Learning Culture, Intentional Content and Professional Educator. Although these are the four pillars the FLN suggests, the pillars can
be recategorized into active learning, collaboration, differentiation and relationship building which still embody the principles of flipped learning.

**Active Learning**

Active learning can be defined as students engaging in the analysis, synthesis and evaluation of content, by completing activities of higher order thinking. The idea of active learning can be established by taking pieces of the Learning Culture and Intentional Content from the FLN (2014). Both the Learning Culture and Intentional Content state that students should be exploring content through meaningful and scaffolded activities as well, develop a conceptual understanding, which is aided by the activities. Estes et. al. (2014), Herreid and Schiller (2013), Jensen et. al. (2015), McLauglin et. al. (2014), Mok (2014), Roehl, Reddy and Shannon (2013) and Stone (2012) all completed research to support the role of active learning in any style classroom. However, the time needed in the classroom to complete said active learning techniques cannot be utilized if the dissemination of content is happening within the same class period due to time constraints. In the flipped learning format, students are responsible for the lower level thinking skill of note taking at home, leaving full class periods of time to be utilized for active learning.

**Collaboration**

Collaboration can be found in the FLN (2014) pieces of Flexible Environment as well as the Professional Educator. The FLN states that the furniture in the classroom should be arranged in such a way that encourages collaboration. Professional Educators within the flipped learning community are encouraged to collaborate with one another, seeking constructive criticism and
sharing best practices. Kim, Park and Joo (2014) state that flipped learning, when compared to a traditional classroom, leads to higher student achievement. As well as collaboration within a flipped classroom also impacted achievement in a positive correlation.

**Differentiation**

Differentiation can be defined as providing different students with differing avenues of learning to learn the same content. The idea of differentiation can be seen in Flexible Environment, and Intentional Content. Within the Flexible Environment, teachers are to be flexible with student timelines for learning and the types of assessments given to each student. Differentiation can be seen within the Intentional Content of the FLN (2014) as the teacher is encouraged to differentiate the ways in which the content is delivered to the students. Siegle (2014) states that flipped learning better lends itself to differentiated instruction for students within the flipped classroom. Work in a flipped learning environment is often completed asynchronously, students working largely independently from peers, at differing locations within the content. The asynchronicity best lends itself to differentiated instruction because the students are working individually, allowing for greater differentiation in the assignments being provided to each student.

**Teacher - Student Relationship Building**

Relationship building is based on the relationship built between the educator and the student, as a model on the professional level, and a person on at the personal level. The Learning Culture and Professional Educator pieces provided by the FLN (2014) can be tied to the relationships built within the flipped classroom, as the teacher is flexible to establish time and
space for student-student and teacher-student interactions and reflections. Within the Professional Educator, the teacher should make themselves available for individual instruction as well as giving feedback from ongoing assessment. This constant evaluation and feedback fosters a growing relationship between the student and the teacher. Estes et. al. (2014) make note of the relationship skills students build within the flipped learning environment, which is propagated by the collaboration that occurs between student and student, if not more than the interaction between student and teacher. In a traditional classroom, the teacher does not have the opportunity to have individual conversations with students every day, but in the flipped classroom, the teacher is not the focus of the room. The teacher is able to freely move from group to group, or student to student and have individual conversations with each student as noted by Bergmann and Greathouse (2016). The topics discussed between the teacher and the student ranged from personal stories, to after school opportunities and more. Crews and Butterfield (2014) state the majority of students in their flipped classroom said the best part of the time in the classroom was the interaction between peers as well as the personal interactions with the instructor. This relationship that is built between the teacher and the student encourages the students to work harder due to an innate sense of care from the teacher.

**STYLES OF FLIPPED LEARNING**

According to Bergmann and Sams (2014) as well as Ash (2012), there is no single correct way to flip a classroom. The idea of flipped learning and the implementation of the pedagogical strategy is completely determined by the teacher and the needs of the students as individuals, as well as the class as a whole. Each class period is different, so each class period may need slight variations of the flipped classroom. Each student within the class period has a different set of
needs, so each student may need slight modification to the flipped learning format the teacher has decided on. No two flipped classroom are alike, and so it should be because every classroom is different. The following sections discuss the differing types of flipped classroom. While each flipped classroom may be individually distinct from one another, there are overarching categories into which they may fall. The differences between the flipped classrooms within a category may differ in small manners, such as how assignments are graded.

**Flipped 101**

The original flipped learning model, pioneered by Bergmann and Sams has evolved over the past decade since its inception. Jon Bergmann and Aaron Sams (2014) have deemed their first version of flipped learning as Flipped 101. Flipped 101 is described as the most basic version of flipped learning, where students complete lower level Blooms Taxonomy tasks, such as note taking, at home, while the upper level Blooms Taxonomy tasks, such as analysing, synthesising and evaluating content, occurs in the classroom. Most teachers begin to flip their classrooms in this format.

The main advantage of the Flipped 101 model is class time can now be utilized for more active learning tasks. By removing the lower level thinking tasks out of the classroom and into the student’s personal space, the teacher can plan for learning activities that are more engaging and require students to use higher level thinking skills. A typical teacher would state that planning activities to be completed in class would take away instructional time because they cannot lecture while the students are actively learning. Having students complete the lower level tasks outside the classroom and the higher level tasks within the classroom, allows for students to
build skills and implement the pillars of flipped learning, active learning and collaboration (Honeycutt & Garrett, 2014). Freeing up time in class to have students actively engaged in the content allows the teacher to differentiate instruction for each student, as well as gives the teacher time to have individual conversations with students and allows the building of the teacher-student relationship.

One major disadvantage of the Flipped 101 format is that not all students have internet access at home, which is one problem faced by Bergmann and Sams (2014) when they initially flipped their classrooms. While some may find it hard to believe that not everyone has internet at home, this is a stark reality. By not having internet at home, students are not able to complete the homework, which in the Flipped 101 classroom is to watch a video and take notes. If the students are unable to complete the lower level tasks at home, they would need to complete them the following day in class prior to completing the in class activity, putting the student behind the class. Another disadvantage of the Flipped 101 model is that students work at differing paces. What the teacher has planned as classwork, may take students a wide range of times to complete. An assignment that may take one student twenty minutes to complete, may take another student two periods to complete. While this opens the door for the teacher to differentiate the workload of the students, it makes planning more difficult, not to mention how to handle the students that need multiple class periods to complete a single assignment.

**In Flip**

One approach that eliminates one of the disadvantages of Flipped 101, no internet at home, is the In Flip model. The In Flip model is regarded as the second edition of flipped
learning, according to Bergmann and Sams (2014). Within the In Flip model, all the work is completed within the classroom. Students complete the note videos in class, as well as the active learning.

The main advantage of the In Flip is that all students have equal access to the internet at their school. The video content is typically created and stored on a platform that can be accessed by most of the technology being used by students today; personal devices such as phones or personal laptops, or school computers. Many schools are now moving to a one to one technology initiative, meaning the school provides each student with a technological device, typically a chromebook or an iPad. With each student having a device to use, and the internet provided by the school, each student has access to the technology in conjunction with the internet that allows them to complete assignments which would be nearly impossible to complete at their homes.

Another advantage of the In Flip is the direct teacher intervention. In Flipped 101, the teacher had the capability of direct intervention while the student was working within the classroom (Roehl, Reddy, & Shannon, 2013). However, if a student had a question while watching the note video at home, the student had to wait until class the following day to receive an answer from the teacher. While the student could take initiative to do some personal research to reach an answer to the question, or write the question down to ask the following day, the student may easily forget, or not have the motivation to do so. The advantage to completing every assignment within the classroom, note videos and assignments, the teacher can have direct intervention and field any questions that arise anywhere in the content.
While the In Flip model provides a solution to give students equal access to the internet, it does not remedy the issue of students working at different paces.

**In Flip Mastery**

The In Flip model allows students the opportunity to complete the required work while still within the confines of the school building, but the thought that students complete the given work at differing paces is still a major drawback; unless the teacher is prepared for such. Mastery Learning is a common concept and pedagogical approach within school that ensures students master the content before moving on to the next portion of content, often with some form of assessment to measure student ability and/or comprehension of the content. Whether that assessment be a formal written assessment, a project that displays student learning, or a personal conversation with the instructor that shows the student has mastered the content or skill.

In the Flipped Certification Level 1 course, taught online by Jon Bergmann (2016), the idea of joining the In Flip model with the Mastery Learning is posed in a joint technique titled In Flip Mastery. Within the In Flip Mastery model, the students move at their own pace through the content while in the classroom, but do not move on to the next topic until a level of mastery has been reached the student (Bergmann & Sams, 2012). This model of flipped learning does not fix the problem of students moving through the content at different paces, but rather allows the teach to ensure that each student is getting the attention they need in the areas they need the most help.

One major advantage of the In Flip Mastery model is students can move at a comfortable pace. The students may not feel the stress because they are allowed to work at a comfortable
pace. Within the In Flip Mastery model, students are responsible for budgeting their time on assignments, and putting in the hard work up front. The In Flip Mastery model forces students to mastery the material before moving on the the next content area or objective. If a student does not reach mastery for a given objective or skill, the student repeats the assignment, makes corrections, and/or relearns the material to ensure mastery has been achieved. By ensuring all students have reached a level of mastery within given objectives, skills or content, the student can then move on to the next.

One drawback of the In Flip Mastery model is the summative assessment at the end of a chapter/unit. If the teacher decides to give a formal summative assessment and requires students to achieve mastery, while each student is working at a different pace, the security and reliability of that assessment are at risk. To combat this problem within the model, teachers either need to make multiple versions of the same assessment, or utilize online testing tools which have the ability to pull from a bank of questions, giving each student a different assessment.

**BENEFITS OF FLIPPED LEARNING**

There are many benefits of utilizing any variation of the flipped learning model within classrooms. These benefits range from students having choice in their workload while working asynchronously from their peers, to the differentiation and individualization of instruction from the teacher, and to the active learning the students participate in during class time.

Within the In Flip and In Flip Mastery models, instructors have the option to allow their students to have choice. By allowing student choice within the classroom, students feel they have responsibility, which tends to lead to higher quality work because students are more proud
of the work they complete. When students have choice in their learning, they are more
motivated to complete the work at hand because they have made the personal choice as to how
they will utilize their time (Roehl, Reddy & Shannon, 2013). Students also learn the soft skills
of prioritizing work, managing their time and taking responsibility for the work they complete.
These are skills that can be learned within the flipped classroom as well as the content of the
course itself. Allowing for student choice also leads to increased student engagement
(McLauglin et al, 2014)(Szafir & Mutlu, 2013). Students are able to focus on a task they have
individually selected because the interest is there.

Due to the fact that students have choice in their work, asynchronous student work is
inevitable because students work at differing paces as well as students may select to complete the
assigned work in a different order than their peers. As students work at their own pace and
asynchronously from their peers, instructors are allowed to individualize instruction in a one on
one setting during class time if needed (Siegle, 2014).

Within the Flipped 101 model where videos are watched at the student’s home, the class
time becomes the most valuable time for student interaction with the material in the form of
active learning. The time in the classroom can be used in ways that best fit the content area of
the class, but should be utilized for active learning. Flipped Learning is best used when coupled
with other teaching and learning strategies, such as project based learning, inquiry based
learning, class discussion and other active learning strategies (Estes, Ingram & Liu,
Using the Flipped Learning strategy has provided students with increased learning and improved confidence as proven by research studies. Students that have been taught content within a flipped classroom have raised their grades from a C+ to a B, and the number of A’s received by students increased by 28% according to Bergmann and Griffiths (2016). According to Bergmann and Greathouse (2016), when surveyed, students reported at 67% decrease in frustration while in class, and marked improvement in confidence before testing, as a result of being in a flipped classroom.

**DRAWBACKS OF FLIPPED LEARNING**

While Flipped Learning has undoubted benefits, some potential drawbacks and criticisms of the flipped classroom style are access to technology outside of school hours, student motivation, and time commitment from both students and teachers (Siegle, 2014). Siegle supplies some suggested answers to these potential drawbacks of using the flipped classroom style which can be expanded upon to fit student needs.

To address the concern of student access to technology, some solutions have been suggested. One such suggestion is that there needs to be an after school time that allows students to stay and complete any work that may require the use of the internet. Another possible solution is to save the videos to an external, removable drive for the students, or give students the option to download the video to watch at home without the internet. Through this form, students are able to take the videos home with them and view them without the use of the internet. By utilizing the In Flip or the In Flip Mastery models, the worry of internet access at home is limited because students are able to complete all required work in class.
Bishop and Verleger (2013) are able to conclude that students within the flipped classroom are more motivated to complete the given assignments when compared to their non-flipped peers. Students tend to be more motivated when the idea of student choice is introduced. As students select the task they work on, increased motivation is a direct result.

As far as the time commitment that is needed from both the teacher and the students, for a first year flipping teacher, there is a large amount of time needed to prepare the content. McLauglin (2014) saw a 127% increase in the time needed to prepare for her classes in the first year of implementing flipped learning due to the need to create and/or curate video content as well as prepare the in class learning activities. At the time of McLauglin’s article, the following years preparation time was projected to be considerably less due to the fact that the video content will already be created. The time commitment from students is no more than what is expected of students in a traditional classroom. In the Flipped 101 model, students watch short videos for homework, where each video is recommended to be two times the students’ grade level (Bergmann, 2016). For example, if a student is in eleventh grade, the video should be no longer than twenty two minutes. In the traditional classroom, a homework assignment may take a student twenty minutes or longer. While implementing the In Flip or In Flip Mastery model, the students complete all work in the classroom, essentially eliminating the stress and time commitment of homework.
Chapter Three: NARRATIVE

A Transition to Flipped Learning: The Oakfield Experience

I began teaching chemistry at Oakfield-Alabama Middle High School within the Oakfield-Alabama Central Schools (OACS) in the fall of 2015 as a long term substitute. As the year progressed, one of the students in my AP Chemistry class was no longer physically able to attend school, yet was able and willing to complete the work from home. OACS arranged for a home tutor for this student, but the content of AP Chemistry was above the ability of the home tutor. I was not able to tutor this student one on one. After talking to my administration, we devised a plan that would allow the student to receive the content at home, without the face to face interaction.

The plan included recording what appeared on my computer screen as I displayed powerpoint slides for my students to write down notes, and to also record my voice as I was lecturing for the period. In this manner, my home student was able to see the board, hear my explanation, as well as hear questions posed to me by his peers. This seemed to be working well as I received emails from the student asking questions of his own. The only downside to not having him in school was he could not complete the laboratory work that accompanies the AP Chemistry course.

After a few weeks of recording my classes live for this student, I worked with the Instructional Technology Director at OACS, Rob, to try and work ahead of the curve. Rather than recording my classes in real time, what if I recorded them ahead of time and students
watched these videos as homework? Then, when they arrived for class, we discussed and applied what was in the video. This lead to some research for technological hardware, software and applications that would make this process easy, as well as some trial and error as to how the students responded to this new style of teaching and learning.

Rob informed me that this style classroom is commonly known as the flipped classroom. I was excited to try this new flipped style of teaching, so I began to implement it with my Regents Chemistry classes as well. I began with creating the video content, the students then watch the video for homework and then discussion, practice and application of the learning is completed in the classroom. In the videos I first created, my students would only see the powerpoint slide on the screen and hear my voice, as seen in Figure 1. Figure 1 shows a screenshot of a video made during the 2015-16 school year. This screenshot is from a video assigned to my students to watch in the flipped learning format. Notice, the screen shows just a powerpoint slide, my students would hear my voice discussing the content of the slide, including explanations of the work.

For me and my class, this style of flipped learning lasted about four days. Bergmann and Sams (2014) suggest that the change from the first rendition of a flipped classroom (Flipped 101)
to the second rendition (typically the in flip) takes about one year. After open conversations with
my students about this flipped learning experience so far, I decided that the opportunities the
students had in class were limiting because every student was forced to work on the same
worksheet, which can been seen in Figure 2. The daily agenda depicted in Figure 2 is what
would be displayed to my students during the Flipped 101 rendition of my classroom during the
2015-16 school year. The student’s homework from the previous night was to watch notes at
home on Boyle’s Law. Class time on this date was then spent answering questions students may
have had and/or developed while watching the video at home. The remainder of class time was
utilized for putting the content from the video into practice in the form of practice problems, as
well as teacher led demonstrations to physically show the concept. The students were assigned
to watch a note video on Charles’ Law for class the following day.

![Figure 2](image)

With differing levels of knowledge, ability, motivation and pace of work, the materials I
had planned for class may have taken my higher achieving students ten minutes to complete,
while my lower achieving students may have spent the full forty minute period completing the
same assignment.
I quickly embraced the chaos that was about to ensue in my classroom, I gave my students a full week’s worth of work at a time, as seen in Figure 3. They would get a checklist on Monday that would outline the whole week for them so they could see the plan for the week, and they continuously had work to complete. Figure 3 shows a sample of a weekly checklist given to my students on Monday during the 2015-16 school year. This checklist allowed for my students to see the work that was expected of them by the end of the week. By taking the weekly workload approach, my students learned to manage their time, set daily goals to accomplish, as well as prioritize the work that needed to be completed. This weekly checklist coincided with the daily agenda displayed on the board, as seen in Figure 4. Figure 4 depicts the daily agenda displayed on the board for all students to see, which would mirror the weekly checklist the students would receive on a Monday during the 2015-16 school year. At this point in the year, my pedagogical approach had switched from the Flipped 101 format, to the In Flip format, meaning all work was completed in class. The top of the board displays the date (in white), the current unit (in yellow) and upcoming formal assessments (in green). The green box just below the heading is used to notify the students what is due that day. The red box on the left is used to let students know what classwork could be completed during the class periods on this date, separated into note videos (in blue) and worksheets (in orange). Lab materials that could be worked on are within the purple box on the right. As well as items that did not fit into a given category, labeled other (in pink). Within the In Flip model I implement, students have free choice as to what they work on within the given period. The daily agenda is more of a menu of suggested items to work on that day.
The next problem that arose from my second rendition of flipped learning was students felt they couldn’t work ahead of the current day because they had to watch the videos at home for homework. This, in conjunction with the fact that some of my students didn’t have internet at home made it more difficult for them to complete the homework. So, I made a new policy in my room, watch the videos in class so you can continue to work. I gave my students the options to watch the note videos at home and/or in class, whichever the student could do, or wanted to do.

By giving my students a week's worth of work at a time, I did not solve the problem of the differing paces at which work was being completed in my classroom. However, what did come from this dramatic change was more empowering to my students: choice. Mok (2014) states that students that would typically struggle or be disinterested in a course have the chance to succeed in a flipped learning environment because they take ownership of their learning. My students loved the fact, most of all, that they virtually didn’t have any homework because I unknowingly had adopted the in-flip model, where everything is done asynchronously within the classroom. Siegle (2014) states that the flipped classroom allows for asynchronous work to be
completed by all members of the class; because work is asynchronous, students can be working on different assignments at different times, see the daily agenda in Figure 4. Due to this fact, the teacher has the freedom to challenge high achieving students, while helping low achieving students. I embraced the chaos that was happening every day. Multiple students working on different assignments, tests, quizzes, labs, notes and homework. My room was chaos, yet organized, busy and productive chaos. I was not standing at the front of my room talking at my students, they were fully engaged in the material and the content, giving me the opportunity to wander around my room, working with students one on one when they needed help. Estes, Ingram and Liu (2014) state that in a flipped classroom the instructor is no longer the center or head of the classroom, but rather an instructional coach that moves around the room assisting students as needed. Honeycutt and Garrett (2014) also state the the shift in the classroom focus from the teacher to the student allows for the time in class to emphasize the efforts and learning of the students.

As the close of the 2015-16 school year came about, I was hired at OACS to come back as a full time teacher for the 2016-17 school year on a probationary, tenure track position. I have continued to use the in-flip learning model in my room in the 2016-17 school year, and after completing research by reading articles, attending conferences and listening to podcasts, I have continued to grow the flipped learning model in my classroom.

Part of this growth also occurred through the online flipped learning certification course created by one of the founders of flipped learning, Jon Bergmann. He comments that the four main pillars of flipped learning are flexible environment, learning culture, international content and being a professional educator (FLN, 2014). These four pillars could be reassigned the titles
I began the 2016-17 school year by physically rearranging the furniture in my room to allow for a more flexible environment for my students. I moved my student tables in a way to encourage collaboration between my students, as well as allowing for small group re-teaching. At the start of the 2016-17 school year, I rearranged some of my student tables to encourage collaboration among students. Pictured in Figure 5 are a few of my tables that have been pushed together to allow for collaboration, to encourage academic discussion and peer teaching. By having students face each other as opposed to the front of the room, the focus is removed from the teacher, and put onto the student. I continue to find academic conversation between students when I am not readily available to help. Students ask and answer each other’s questions while waiting for my assistance. Removing the front of the room is a key component of flipping a classroom. While most of the tables in my classroom have been arranged into groups to encourage collaboration, academic discussion and peer teaching, there is still a need to have a space available for small group instruction, bringing the focus of the classroom back to the teacher. This small group space can be seen in Figure 6. This setup is not meant for full class lecture, but rather small group re-teaching and/or clarification of content and misconception. By arranging the tables facing the board, as the instructor, I have the capability to use the whiteboard and smartboard to help in re-teaching in a small group setting. The small group re-teaching is driven by student questions. Yet in this small group, as the instructor, I still do little instructing. Students are answering questions, or I pose the student question using different words, while building in scaffolding and higher level thinking. This small group setting is also useful when
completing inquiry labs, where students are responsible for creating their own procedure to solve a given lab problem or hypothesis. This setting can be used to brainstorm group ideas to get the small group started in procedure writing.

![Figure 5](image1.png) ![Figure 6](image2.png)

Kim, Park and Joo (2014), the flipped classroom increases the amount of collaboration between students when compared to the traditional classroom. Knowing this, I grouped tables together and put the chairs facing each other so students could have face to face conversations with each other. I arranged the groups of tables in different directions as to remove the idea of the front of the room. By mentally removing the front of the room, where the teacher is the main attraction, the mood of the room shifts; instead of a teacher centered room, I now have a student centered room, with student choice. This change in focus from the teacher to the student sets up the learning culture that is expressed by the FLN (2014). Planning intentional content is the shift from passive learning to active learning within the classroom during the time the students are assigned to be in the classroom. The class time is now used for students to interact with the content rather than watch or listen to the presentation of the content. I have been able to complete about 10% more labs with my students because of the introduction of the flipped
classroom. Figure 7 shows a student lab log, tracking lab minutes completed by each student within my Regents Chemistry class. Students are responsible for tracking their own minutes throughout the year, as well as having one on one conferences with my to make sure labs are not getting lost. This picture was taken at the end of the third quarter of the 2016-17 school year. During the 2015-16 school year, only 36 labs were offered/completed at the end of the fourth quarter. During the 2015-16 school year, about 9 labs were completed per marking period, as compared to the 2016-17 school year where about 11 labs per marking period were completed. Being a professional educator includes professional development, seeking help and resources to better flip the learning of the students. I have attended conferences as a participant as well as an educator to better flip my classroom. I have also taken the initiative to personally watch webinars and listen to podcasts about flipped learning and the best practices associated with it.

Figure 7

At the start of the 2016-17 school year, I had not yet created videos for the first semester, so a good portion of my preparation time was used to create videos of the content which my students would watch. Bergmann and Griffiths (2016) suggest that teacher created videos are better than videos found on the internet, such as youtube, because the students like to feel connected to their teacher. One way to connect with the teacher through video is to have a video
of the teacher in one of the corners of the screen, so the student can see the teacher. The videos I have been creating for the duration of the 2016-17 school year have all had a video of myself in one of the corners of the screen, so my students can see who is teaching them. Figure 8 is a screenshot of a video used during the 2016-17 school year. The differences between this screenshot and the screenshot found in Figure 1 are my face in the corner of the screen, as well as the students being able to see my hands complete the work they are also completing. Throughout the 2016-17 school year, I have given my students videos I created without my face in the corner, and have gotten feedback that my students prefer when they can see me in the video. By using a document camera, I am able to show my students the work I would like them to show when they are completing the practice problems associated with the content. While suggested that creating videos is preferred over curating videos, using a platform such as youtube is not a bad idea to house created videos. Sites such as youtube make it easy for students to access video content on a needed basis. While creating videos is recommended over curating videos found on youtube, sites like youtube make it easy to store videos in a public place. The screenshot above shows my youtube page, where I house all my video content for my students to access. I have created separate playlists for each unit throughout the year so students can easily navigate their way through the content. Using a site that students are familiar with makes it easier for the student because they are comfortable with the layout, the features and how the site functions. Some of my students have taken the initiative to subscribe to my youtube channel, seen in Figure 9, and get notification when new videos are posted. This is one additional way to have students buy into the flipped learning model.
At this point in my flipping, students had the choice as to what they work on when they come into my classroom, but they select what they work on based on a given list, much like the weekly lists students received my first year of flipping. More to come on this later in this paper. My students had the option to work on what they felt needed to get completed, whether that was note videos, worksheets, labs, tests or quizzes, see Figure 3 and Figure 4. Students were actively engaged in their learning, and they were actively learning (McLauglin, 2014). Students were moving through content at a little quicker pace than if I were to stand at the front of the room and lecture to them. This quicker pace is supported by the research completed by Bergmann and Greathouse (2016) which found the flipped classroom allowed for a 30% increase in the pacing of the class. The students could move at their own pace and had choice, which motivated them to work and stay on task. Students knew that I would be around to check on them, their work and answer questions about every five to ten minutes, depending on the class size, which helped them stay on task. Due to the quickened pace, I was able to plan to complete more laboratory experiments for my students in order to get them fully immersed in the content and the application.

My students became concerned with the thought that they had to complete labs during their assigned lab period and notes during their scheduled class period. After a conversation with
my students, I no longer differentiated between lab time and class time; students were able to choose their lab groups and what periods they completed the labs. When they were at a place in the content to complete a lab, they asked their peers if anyone was at the lab yet. This worked as an organic way to constantly create new lab groups, which works into Bergmann’s idea of collaboration.

By changing to the in-flip model, there were noticeable positive changes in the behavior of my students. Without prompting, my students would begin to work on material as soon as they entered the room. There was no wasted time at the start of class checking homework. My students knew what work was expected of them, and they got right to work. On occasion, I would have a class announcement to make, so I would give my students a signal by standing on a chair, and they all stopped their work for a few moments until the announcement was done, and then went back to work. I found that my students wasted no time getting to work at the start of the period, staying on task throughout the period, and I had many students come to my room to spend additional time working on chemistry. During class, my students worked bell to bell; after class, my students came back to continue to work on chemistry material.

Part of this continual work atmosphere was also having students seated in groups as opposed to the traditional rows which encouraged them to have conversations. Another positive behavior change my students exhibited was increased academic conversation and peer teaching. My students love to talk, and I love a noisy classroom, as long as the noise is content related. By listening in to my students as classes occurred, I found my students having more academic conversations and using the vocabulary correctly. Prior to flipping my classroom, my students didn’t have the chance to use the vocabulary in conversation; they would hear me use the
verbiage in lecture, but rarely had the chance to openly use it in personal conversation. Part of the student use of the vocabulary came in the form of peer teaching. With only one of me in the classroom and with class sizes between fifteen and twenty students, there is some wait time if a student needs help. However, the students have taken some responsibility of their own to either watch a video again to get help, or ask a group member so they aren’t wasting class time. When the peer to peer interaction happens, the students are using the vocabulary, as well as getting additional practice in the content as they direct their peers.

An additional change that occurred part way into the 2016-17 school year was a change from weekly checklists to unit packets, see Figure 10. Rather than giving students a weekly overview of the assignments, I decided to give them a full unit of work at once, averaging about 3 weeks worth of work, see Figure 11. The unit packet included all notes (Figure 12), worksheets (Figure 13) and labs (Figure 14) the students were responsible for completing. The only assignments not in the unit packet were assessments (Figure 15). Each unit was broken down into subsections of the unit, with associated note videos, worksheets, labs and assessments. Students were still working at their own pace, but now had the scope and sequence of a full unit. I found that if students could see what was expected of them on a more long term range, as opposed to a weekly range, there was more connectivity between the content for the week.

Figure 10
Figure 11, shown to the left, pictures a unit checklist, given on the inside cover the unit packet. The unit checklist allows the student to see all the work required to complete the unit. Each unit is broken down into topics, and within the Mastery learning model, everything within a topic must be completed at a mastery level before moving on to the next topic. In New York, mastery is labeled as 85%, so I hold my students to the same standard as the state. Each student must complete every assignment within a topic (work, lab and assessment) before moving on to the next topic. If mastery is not reached, the student makes corrections or completes the assignment again until mastery is reached.

In Figure 12, shown to the left, a sample note page from within the unit packet. Each note video has a guided note sheet for students to complete as the video is playing. Even while students are watching the video, they are not passively sitting, they are actively sitting and taking notes as they would if the instructor were to lecture in class. Each note sheet mirrors the slides that appear in the video, including the title slide (which matches the video number and title on the unit checklist). Each video and note sheet start with the objective, informing the student what they should know or be able to do at the end of the note video. Note sheets are guided notes so students are filling in the blanks provided to them. Most note sheets also include some example problems in which I guide them through. This guide will then be used to help them complete the practice problems and/or
the lab work associated with the content. I have found my students pausing the video to fill in the blanks, then playing the video to listen to my explanation of the slide while they take additional notes on the lines provided. If compared to traditional classroom, students frantically copy everything on the board and pay little attention to what the instructor is saying.

Figure 13, to the left, pictures a worksheet that is associated with the note and video, as found on the unit checklist. Each student completes the work and then the work gets checked for mastery before the student moves on to the next topic within the unit. Students are often found working in small groups, providing assistance to each other when needed. When students are unable to help each other, then I step in and help in a small group setting and determine if re-teaching in the small group setting is needed. This assessment is made through questioning and informally assessing the level of knowledge and comprehension of the group members.
Figure 14 shows a student lab report. As seen in Figure 7, many labs have been completed during the 2016-17 school year, some of which are required to have formal lab reports. Since flipping my classroom, the quality of the lab reports has increased. Students spend more time writing them and putting thought into their writing. Students are also more likely to ask questions while writing the report for clarification of data, or help with calculations. With the school wide initiative of one to one chromebook devices, lab probe-ware is frequently used to provide graphs of student as seen on the left hand page of this student’s lab report.

In changing to the unit of work at a time, I have found an increase in the questions my students are asking, as well as an increase in the quality and level of thinking that is required to ask these questions. Prior to flipping my classroom, my students asked many questions revolving around “what,” however after transitioning my traditional classroom into a flipped learning experience, the questions my students asked now revolved around “how” and “why.” Not only were my students asking higher level questions for clarification and out of pure wonderment of the content, I was able to ask them higher level questions every day, in a one on one setting, giving me, the instructor, a daily informal assessment. The benefit of having the daily informal, verbal assessment, was that I was able to hear the thought process of the student as they answered my questions or explained their thinking to me. Within these personal conversations with students, my students had a chance to use the vocabulary from the lesson or unit in conversation, giving me the chance to correct any misuses or misunderstandings of the vocabulary terminology. I have had many opportunities in which I overhear student conversation and/or peer teaching where the vocabulary not only being used, but being used in the correct context. Roehl, Reddy and Shannon (2013) state that the instructor benefits from a
greater insight into student knowledge and thinking because of regular interaction with the students, not just seeing the results of the learning through formal assessment at the end of a chapter.

This change in how the students received the workload lended itself to an additional change in the in-flip model to also incorporate mastery learning (Bergmann and Sams, 2014). I am currently employing the in-flip mastery model in my classroom. Students still get a unit of work, divided into small subsections, but students cannot move onto the next subsection until the current section is completed for mastery. I have defined mastery to my students as 85% or higher because scoring an 85% or higher on a New York State Regents Exam is classified as mastery. I have struck a deal, which creates a win-win situation in my classroom: my students cannot move on to the next topic until mastery (85%) has been reached on every assignment within the topic (ie. homework, labs and quizzes). If the student does not reach mastery on any part of the section, that portion may be completed as many times as needed to reach the mastery level. This is a win-win situation because the students win by completing assignments an unlimited number of times until the grade is above 85%, which in turn helps their average in the class. As the teacher, this is a win because it ensures that my students are understanding the first concept before moving on to the next topic, ensuring that students have a deeper understanding of the content.

One drawback, in terms of planning, to the in-flip mastery model is the unlimited amount of retakes a student is allowed to have. This is a drawback because it forces the teacher to create numerous copies of quizzes and/or worksheets so the student cannot simply memorize the order of the answers, see Figure 15. Figure 15 shows the Assessment Trays located in the front of my
classroom. When a student is ready to take an assessment, they can find it at the front of the classroom. Each assessment is labeled and color coded so the student knows which tray their assessment is in. Located in the tray is just the first version of the assessment. Within the In Flip Mastery model students may retake a quiz until mastery (85%) is reached, however, each time they take the quiz, they get a slightly different version. The extra versions of each quiz are kept in my desk, and students may take the retakes when they have reviewed the material and ask me for the next version.

![Image of test/quiz trays]

**Figure 15**

By varying the questions on the worksheets and quizzes, it shows that the student is actually mastering the material, or at least showing growth as the number of retakes increases. Having students retake a quiz on a particular section can also be used as a teaching tool with individual students. In my class, I used the in flip mastery model in the Reduction - Oxidation/Electrochemistry Unit, I had one student that retook a quiz four times and continually missed the same questions. As the teacher, this helped me to identify that this student didn’t
understand the concept of oxidizing and reducing agents, which propagated a one on one teaching session to help him better understand what he was struggling with.

Although multiple attempts may be taken by students on worksheets, labs and quizzes, I allow my students to take the unit test once. In theory, if a student has completed everything in a unit and achieved mastery on everything, the test score should also come out to be mastery as well. I am waiting for results to prove this theory within my own classroom. However, if students do poorly on the test, I do allow them to complete test corrections to make up half the points they have missed on the test. This allows the student to reflect on what they missed. As a student takes ownership of their learning they become more aware of their personal learning processes and can reflect on the methods best used to educate themselves (Roehl, Reddy and Shannon, 2013). Did the student miss the question because of reading error? Was the question missed due to lack of knowledge of the content? By allowing test corrections, the students get to see the content again, use their notes, peers or myself for help, which opens the door to talk to my students about test taking strategies for the future. In a study completed by Herreid and Schiller (2013) students that learned via the flipped approach scored higher on tests than students that learned via the traditional approach, Bergmann and Greathouse (2016) found that student test averages increased by about 2% as a result of flipped learning. In a study completed by Kazu and Demirkol (2014), greater academic gains were found to be a result of flipped learning when compared to a traditional style classroom. As well as students in the study completed by Bergmann and Griffiths (2016) the overall average for her students increased from a C+ to a B.

As a district, OACS has made changes that have made flipped learning easier than expected. Other than offering wireless internet within the buildings, OACS is currently a one to
one school. A one to one school is a school and/or district that has one device for every student. At the start of the 2015-16 school year, grades 4 through 6 were one to one. At the start of the 2016-17 school year, students in grades 3 through 12 all had a school issued Dell Chromebook. The Oakfield-Alabama Central School District is a one to one school in grades 3 through 12. This means, the district has provided all students in grades 3 through 12 with a device to be used in and out of school. By supplying students with the devices, all students have access to the internet while at school. The roll out of the Dell Chromebooks, seen in Figure 16, to students at OACS has been a benefit for teachers like myself who have decided to flip their classrooms. My students have access to content and me almost continuously. By providing each student with a device, we are allowing students the opportunity to grow in technology literacy as well as closing the technological ability gap. With each student having a computer to bring with them to class every day, flipping became easier because every student had a device on which to watch the note videos. OACS has adopted Schoology (Figure 17) as the Learning Management System (LMS) for teachers and students to use to disseminate information and materials. Schoology is a platform that has a comfortable Facebook feel to it, yet allows teachers to organize assignments and materials. Pictured above is the class materials page for my 4th Period Regents Chemistry class. I have sorted the year out into the four quarters, as well as the units within that quarter. My students are able to find links to youtube for the note videos, assignments and grades all through Schoology.
After just one year with a flipped classroom, I feel that my students are learning more than just chemistry, but also life skills that will help them reach success at the collegiate level and also in the workforce. There is no one way flip a classroom (Ash, 2012), and more research is being done every day to help this pedagogical approach become a better tool in the classroom, therefore, I will continue to change what is happening within the walls of my classroom to help prepare and teach my students.

Discussion and Summary of Process

In the project titled *A Transition to Flipped Learning: The Oakfield Experience*, research was completed to define, find best practices for and implement the flipped learning model. The implementation of the flipped classroom for this project was started before the beginning of this project, therefore the research supported changes that were made within the structure of the classroom.

Once the research was completed, a narrative of my first year of implementation of the flipped learning model was written. One goal of this project is to inform other educators of the benefits and best practices of utilizing the flipped learning model. From the written narrative and provided pictures, educators have some visuals and research supported text to retrieve information. This text, as a whole, can be used by educators interested in flipping their
classroom, but do not know what is entailed in the process or preparation. The narrative tells the story of a first time flipped educator that gets comfortable with the process and has built a flourishing flipped learning environment.

There is no one way to flip a classroom. I am currently happy with the flipped learning model in use in my classroom, however, new discoveries are being made with this approach because it is still in the infancy stages of development. From the research that has been done, it is proven that flipped learning leads to improved test scores, increased student engagement, and is most effective when paired with other active learning techniques. From my personal journey, I can attest that the flipped learning model forms students that are more aware of their learning process, study habits and teaches them soft skills, such as communication, collaboration and time management, that will lead to future success.

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