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# The transition of flipped instruction : from professional development to classroom

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# The transition of flipped instruction : from professional development to classroom

## **Abstract**

This action research study was designed to implement flipped classroom professional development for high school teachers, and investigate whether the flipped professional development could be transferred from the teacher learning into student learning. Over three months the teachers' flipped professional development covered the flipped classroom model, differentiated group work, and the technologies needed to flip a lesson. Each of the seven participants created and delivered three flipped lessons in their classrooms. The major findings suggest that the flipped learning skills were transferred from professional development to practice (with the aid of instructional coaching.) Recommendations for further professional development on classroom expectations and more technology tools are presented. In conclusion, the flipped model skills can be transferred into the classroom setting.

**The Transition of Flipped Instruction:  
From Professional Development to Classroom Practice**

A Graduate Action Research Report  
Submitted to the  
Division of Instructional Technology  
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In Partial Fulfillment  
Of the Requirements for the Degree  
Master of Arts  
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by

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This Action Research Report by: Alison J. Sauter

Titled: The Transition of Flipped Instruction: From Professional Development to Classroom Practice

has been approved as meeting the research requirement for the Degree of Master of Arts.

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### **Abstract**

This action research study was designed to implement flipped classroom professional development for high school teachers, and investigate whether the flipped professional development could be transferred from the teacher learning into student learning. Over three months the teachers' flipped professional development covered the flipped classroom model, differentiated group work, and the technologies needed to flip a lesson. Each of the seven participants created and delivered three flipped lessons in their classrooms. The major findings suggest that the flipped learning skills were transferred from professional development to practice (with the aid of instructional coaching.) Recommendations for further professional development on classroom expectations and more technology tools are presented. In conclusion, the flipped model skills can be transferred into the classroom setting.

*Key Words:* flipped classroom, professional development, transference, group work, flipped lessons, discussions, interviews

## **The Transition of Flipped Instruction: From Professional Development to Classroom Practice**

The flipped classroom model is an innovative way to deliver instruction to all ages of students and adults, and allows for differentiation and collaborative group work (Bergman & Sams, 2012). Finding time to provide ways to differentiate for students during class time, as well as provide opportunities for collaborative group work, are challenging in today's high school classrooms because students have been historically spending their in-class time absorbing content knowledge and information, led by the teacher. Due to innovation and new technologies in classrooms, like one-to-one computing initiatives, teachers are able to use different teaching models than ever before. Instead of a teacher centered classroom with the teacher leading all instruction during class time, teachers are now working with different routines to provide more differentiation and collaborative group work for students, to maximize the effectiveness of the teacher-student contact time. They are turning their classrooms into student-centered environments.

Traditional teaching in the 20th Century consisted of a teacher leading the learning and instruction in a classroom. With the dawn of the 21st Century, as well as the influx of mobile technologies, teachers have started to look at their classroom instructional dynamics and learning pedagogies differently. What worked for the 20th Century learner is no longer what works best for students learning today. This is due to new technologies available to classrooms, as well as new and innovative ways to deliver instruction. "Today's youth thrive on multimedia, multitasking, and social environments for every aspect of their lives except in education" (Rosen, 2010, p.3). Because of this,

students are apt to be less motivated to learn. Flipped instruction has proven to be an innovative way to enhance student learning. According to the online Flipped Learning Network (Bergman, 2015), flipped learning means using lecture videos as homework while utilizing class time for more in-depth learning such as discussions, projects, experiments, and to provide personalized coaching to individual students. The basis for the model is that the lecture, or lesson for the next day, is video recorded and presented to the students as homework on the night before. The students watch the video the night before class to prepare for differentiated activities the following class day, which are guided by the instructor.

I wanted to adopt flipped instruction for my work at a Midwest high school as the instructional coach of technology. My job is to support teachers in their use of technology in a sound pedagogical way that maintains content coverage, while also providing active learning activities for students. Our high school is a 4A school located 15 miles south of a major Iowa metropolitan area. There are 1,192 students currently enrolled. The building does not receive Title I support, but we do have a wide range of socioeconomic status within our student families. Our school is 85% Caucasian, 8% Asian, 5% African American and 2% Hispanic. An alternative high school program is also housed inside the building. Students in this program use the Odyssey program to take online credit recovery classes.

We provide a digital learning environment, also known as a one-to-one environment, for all students at our high school. Each student has been issued an 11” MacBook Air laptop. Our district uses the Google Apps for Education platform, as well as Apple’s iLife suite of products. The district recently purchased a learning management

system called Schoology, where teachers deliver content to students and students turn assignments into teachers. Using technology is an expectation for teachers and students when it comes to lessons and other classroom tasks in our school. This is a building-wide expectation with very few exceptions.

The major problem that we are facing is a sizable gap between the availability of technology and technology usage for instruction. Our school has invested over a combined 1.5 million dollars between our technology infrastructure, mobile devices, software, and technical and teacher support needed for this program to be successful. However, teachers are not able to successfully and innovatively integrate technology to enhance student learning, because time has not been structured into the district PD plan, teacher technology skill sets are not completely proficient, and most teachers do not have an awareness about the differentiation opportunities that go with the flipped classroom model. Students are not engaged in learning via technology, nor are they getting cooperative group work opportunities because of these factors as well. Some parents in our community have struggled with the notion that students will learn from videos. In fact, the few teachers who have tried using this instructional model, have received resistance to the changes from parents.

Teachers want to learn the technological component of the process, but they lack the knowledge and skills to enhance student learning by innovatively using the technology. They also are challenged by the concept of differentiation and cooperative group work. As the technology coach, my main responsibility is to coach and facilitate the professional development training for teachers on technology for our digital learning environment. The traditional professional development is not appropriate, because

teachers are not learning about technology integration during our professional development days this year, unlike years past. For the purpose of this action research, I will provide the professional development about flipped classroom model, and work with teachers to implement flipped instruction. The transition of flipped instruction starts with the teacher learning the technology and pedagogy involved in the model.

The purpose of my action research was to help teachers utilize the one-on-one digital learning initiative's new technologies to innovate teaching practices in order to enhance learning by adopting flipped instruction. I attempted to investigate whether the teacher professional learning about flipped instruction can be transferable to classroom practice, without excessive training hours. The action research focuses on the flipped teaching model and the differentiated classroom activities common in a flipped classroom environment.

My action research attempted to answer the following research questions:

- 1). Could the flipped model transfer from flipped professional development to classroom practice?
2. If the answer was Yes, How could the flipped model transfer from flipped professional development to classroom practice?
- 3). What changes in classroom activities were visible?

Involving teachers to explore the effectiveness of flipped instruction was the first step that I took. If teachers learn about the flipped classroom model, and can use it successfully, innovative lessons will be delivered to our high school students. Ultimately the teachers, students, and parents will benefit from this implementation. If success is seen in this study perhaps more flipped classroom research can be initiated in the future.

This study could help persuade our district administration to make decisions about flipped learning by making it a priority for funding and professional development opportunities.

The significance of my action research should directly benefit teachers who are participants and investigators throughout the project. The teachers would need to learn about the flipped classroom model and be able to deliver lessons using it with their classes. This will involve the teachers learning not only the technological component of the process, but the teaching ideology as well, in order to complete the transfer goal of flipped classroom professional development.

My action research project could directly benefit our students as well. The transference of the flipped classroom knowledge and processes is achievable from the researcher to the classroom teachers' classroom practice. Students will have more opportunities for differentiation and different class session experiences as the teacher offers different in-class activities. The students will also benefit from this research, as the classroom teachers will be utilizing different technologies with students, which may allow for more student engagement.

My action research would help me, as an instructional coach of technology, determine how best to help the teachers who I serve when it comes to the flipped classroom model. It would also help me determine if more flipped classroom model advocacy is needed for the school, and whether or not my training program was sufficient to meet their needs. I would also like to share this information with other technology coaches at professional gatherings and conferences. There seems to be little rigorous research done to measure the effects of this pedagogy (Goodwin and Miller, 2013). This

action research project will also help me communicate with my school district administrators about the process of creating a Flipped Classroom lesson structure for more classrooms and the professional development that it would take to do that. In other words, this research has the potential to influence policy making for our district's professional development model. Perhaps this research would also benefit those who work with instructional technology integration who have the same needs as our district.

### **Literature Review**

As mentioned above, the purpose of this literature review was to explore the effectiveness of the flipped classroom model to understand the current state of knowledge about the model in order to render judgments on the adequacy of the research, in order to provide me a conceptual framework about my action research. A total of ten peer-reviewed journal articles and two books have been reviewed. The peer-reviewed articles selected highlight the flipped model in secondary or post secondary education. With more and more Iowa high schools moving to 1:1 environments, and the push to change the way instruction is delivered to students, teachers are afforded more innovative teaching opportunities. This review will attempt to inform its readers about the effects that can be gained when using the flipped model. Three major themes emerged from this literature review, namely the history of flipped instruction, benefits of flipped instruction, criticism of the flipped instruction.

#### **History of Flipped Instruction**

In 2007 two chemistry instructors, Jonathan Bergmann and Aaron Sams, posted their own courseware and video lessons online for absent students who appreciated the opportunity to see what they had missed, and the first prototype of the flipped classroom

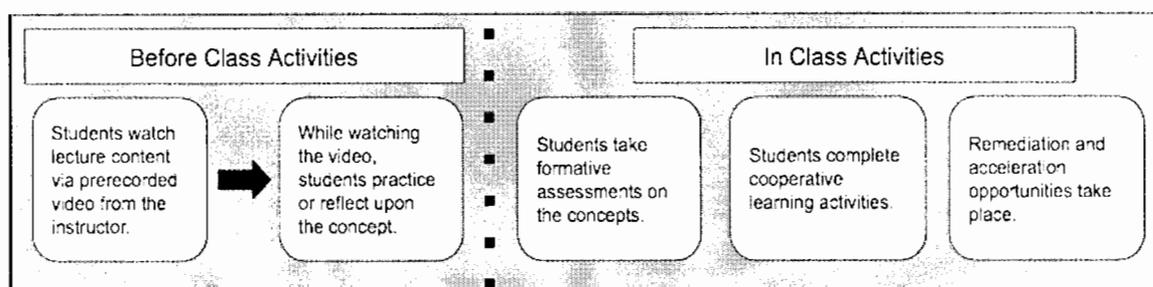
had arrived (Zhang & Fan, 2013). Since that time they have completed research on this model as a way to deliver instruction all of the time, have written books, and created an online learning network for teachers who need resources to flip their own classroom instruction. Bergman and Sams’ books, peer reviewed journal articles, and other research articles have been used to determine the effectiveness of this transformative teaching practice.

As the demands on faculty time increase and as the volume of information for which students are responsible mounts, the use of formal lecture-based content delivery may increase (Goldberg & Schramm, 2006). This reduces the in-class opportunities for teachers to create a student-centered environment in their classrooms. In a flipped, or inverted classroom, the teacher “delivers” lectures before class in the form of pre-recorded videos, and spends class time engaging students in learning activities that involve collaboration and interaction (Bergman & Sams, 2012; Mok, 2014 ).

In the typical flipped classroom, students have online access to a series of short video lessons that may be viewed at the student’s convenience (Arnold-Garza, 2013; Gunyou, 2015). With the lecture portion of the class covered by the video, the in-class time is dedicated for active learning and can be tailored to the needs of the students in the classroom. Figure 1, based on Gunyou (2015), I made the following figure to show the progression of the flipped model activities:

Figure 1

*Typical Flipped Classroom Activities*



### **Benefits of Flipped Instruction**

The flipped classroom model has been used to enhance student mastery (Gunyou, 2015; Talley & Scherer, 2013). Although the above table is a framework of possible activities, the in-class and before-class activities can vary. Talley and Scherer (2013) completed a qualitative study on the flipped classroom model at a mid-Atlantic college campus with a psychology class. They had their students watch the video lectures prior to class and tasked them with the assignment of making their own video lecture on the content to be submitted to the learning management system prior to the next in-class time. The classroom time was then used to edit and correct any common mistakes with the videos. They found that the self-explanation learning method employed higher level thinking skills because students had to explain, interpret, and summarize the material.

Throughout two studies it was apparent that flipped instruction can engage students in active learning during the class time (Clark, Norman, & Besterfield-Sacre, 2014; Jamauldin & Osmon, 2013). For instance, Clark, Norman, and Besterfield-Sacre (2014) completed a qualitative study on the flipped classroom model and student engagement in post-secondary engineering. The research results showed that nearly two-thirds of the students preferred problem solving in class to passively listening to lecture. The students enjoyed having the time to actively work on the skills assigned, rather leaving the practical application to the post-class activities (p.8).

In contrast, Jamauldin and Osmon (2013) completed a quantitative analysis, using a questionnaire with Likert scale to study the flipped classroom and student emotional engagement, behavioral engagement and cognitive engagement at the college level. They found that students were more engaged with the material provided in the flipped

classroom when they felt interested in the class, enjoyed learning new things, got involved, felt good in class and had fun. The flipped model was more engaging than a traditional lecture model because students were actively participating in their learning.

### **Challenges**

Like any instructional model, there are challenges with the flipped classroom as well. In order to flip your classroom lessons, much time is needed in the preparation of the videos and the in-class activities. One challenge raised by researchers and instructors is the use of the model as an excuse to continue bad teaching or implementation without reflection (Arnold-Garza, 2014). Reflection is an important practice for teachers, especially those who flip their classrooms. Other researchers have noted the importance of not only teacher self-reflection, but student self-reflection as well. “It is important for the teacher to be able to see and comment on specific aspects of student reflection. The feedback cycle will be crucial in student learning” (Roehl, Reddy & Sannon, 2013).

Another challenge, or criticism of the model is the technology requirements needed to make the model successful. Having Internet connection, hardware, and software can be challenging, especially for those classrooms that don't have a one-to-one computing environment. However, it is important to help students learn and develop their learning skills using innovative methods of instruction (Tsai, Lee and Shen, 2013). Without technology, innovation is much more challenging. This problem could potentially help administrators consider adding newer technologies if research backs up this claim.

To my knowledge, very little research has been published on the flipped classroom model for K-12 teachers. As mentioned above, most research has been done at

the postsecondary level. I have also had a challenging time finding any research regarding the flipped classroom model and professional development transference. This literature review has used the articles to reference what has been done when it comes to research on the model. My action research would strive to fill the gap for research in secondary education and with an emphasis on the transition of professional development to classroom practice.

### **Methodology**

My six-week action research was designed to involve seven high school teachers to be learners in a flipped professional development environment, using pre-recorded lecture information and prepared articles and websites to study, with differentiated activities during our face-to-face class sessions. As an action researcher and an instructional coach, I developed three flipped professional development modules for teachers to experience throughout the first four weeks of this study. Module 1 focused on the basic concept of the Flipped Classroom model. Next, during Module 2, we focused on the types of differentiated classroom activities and group work that can pair well with a flipped lesson. The last module, Module 3, focused on the technology tools that help foster a highly technological classroom environment if you flip lessons.

After the teachers worked through the learning process, they were given two weeks to create three flipped lessons for their own classrooms to be delivered the following month. In this section of the report, I would first report the context and participants, then address how I dealt with ethical issues, and finally articulate my decision about the methodology.

### **Context and Participants**

Out of seventy-five teachers in our high school, ten teachers showed interest in this study. After our initial meeting, only seven decided to commit to the study. Two of these teachers are in our math department, while the other five teach language arts. The years of experience range from first year to eleven years of service.

I chose this group of participants because I am closely involved with our high school building. This is our only school center that has a 1:1 environment. All of the teachers for this group have students from freshman to seniors in their classrooms throughout the day. One of the participants works with students who are English language learners, while two others work primarily with at-risk or special education senior students. These students struggle to meet the English requirement for graduation.

### **My Relationship to the Participants**

I have been the instructional coach of technology for a Midwest high school since the 2014-2015 school year. This is my second year in this position. When I was a classroom teacher at the elementary level, the flipped classroom model intrigued me. During my time as the instructional coach of technology, I have been a graduate student at the University of Northern Iowa, where I have learned more about the flipped model as well as technology integration best practices. I work with the study participants closely on a weekly basis by providing them assistance with their curriculum and delivery of instruction in regards to technology integration. Four of the participants are in their first year of service. This study has been a way to help those teachers learn more about technology integration for our digital learning environment.

Table 1

*Participant Information Table*

<b>Teacher</b>	<b>Years of Teaching</b>	<b>Content Area</b>	<b>Grade Level</b>
A	13	English & Literature	10-12
C	11	Algebra	10-11
E	11	Algebra & Geometry	10-11
B	1	English	10-11
D	1	English	9-12
F	1	English	9-12
G	1	English	9-12

I chose to focus on the flipped classroom model for two reasons. The first is that it is an innovative way to deliver instruction and provides different differentiation options for teachers. Given the fact that we have a 1:1 digital learning environment, I decided that this would be a great way to integrate more technology into our classrooms. The second reason that I felt that the flipped model would pair nicely with our building is because we are learning about the Gradual Release of Responsibility instructional model as a building through professional development. Focused instruction and cooperative group work are two big components of GRR. The flipped classroom model allows the teachers to focus, or capture their instruction, with a clear purpose, as well as give more opportunities for group work, rather than use class time for lecture only.

As the action researcher for this study, I was able to spend more time with teachers in their classrooms, getting a sense of their needs and routines. This was also a great opportunity for me to understand what technology tool skills the teachers came in with, and needed in order to complete the study. In the past I have been more of a technology professional development deliverer, not an active role player in lesson planning and delivery.

The University of Northern Iowa Internal Review Board approved my action research study in December of 2015. I also received the permission of our district superintendent and the building principal. This study was voluntary, and interested participants came to me in order to become involved. The research study began in January of 2016. All individual discussion board data, classroom observations, and final interviews were not shared with building administration or other teachers or coaches in the building. The teacher names were abbreviated in all study documentation.

This action research study is qualitative in nature to gain an in-depth understanding of underlying reasons, opinions, and motivations for the flipped classroom model and how it can be transferred from professional development to the classroom. I wanted this study to provide insights into the model and help develop ideas for future implementation for other teachers in the building.

### **Procedures of Action**

After gathering preliminary data on a survey using Google Forms in January of 2016 and holding an informational meeting with the participants, I began the planning and producing of instructional media in order for the teachers to understand the flipped classroom model. I created three flipped lessons, or modules, for them to explore, and

placed them in our learning management system. After each module was delivered we had a 30-45 minute meeting where we dove deeper into the module contents. This gave me a chance to answer questions that they had, and get an understanding of how they planned on using the model. The modules and their delivery dates were as follows:

Table 2

*Professional Development Modules*

Module Number	Module Title	Date Delivered
Module 1	Flipped Classroom Model Basics	January 25, 2016
Module 2	Differentiated In-Class Activities	February 8, 2016
Module 3	Technologies to Utilize When Flipping Your Classroom	February 22, 2016

The teachers also participated in an online discussion board post after each module lesson as well. These were posted on our study group page in the learning management system provided by the school district.

Once these modules were delivered, and we met three times, all participants in the study were given a day out of their classroom to plan and prepare three flipped lessons to deliver before March 24, 2016. I was available the entire day for them to use to gain insight or assistance on technology needs, as well as differentiation activity planning. Each participant scheduled his or her lesson dates with me so that I could observe his or her flipped lesson in real time. After the participants flipped three lessons, they sat down with me individually in order to participate in an end-of-study interview, where I collected qualitative data. The interviews took place on March 25, 2016.

### **Data Collection and Analysis**

I collected five different types of data for this study, which included pre and post study surveys, discussion board entries, observations of teaching practice, and individual participant interviews at the end of the study. I also kept journals during my action research. (what the content of journal). Classroom observations were also recorded in each participant's classroom. All of these pieces of data were gathered, analyzed, and coded for similarities, differences, challenges, and successes.

#### **Data Collection**

The first was a pre-survey, which included questions about their experiences with video, cooperative group work, and technology tools. This same set of questions was given in a post-study survey. I used Google Forms for these surveys and used the spreadsheet data analysis in order to compare participant-to-participant, as well as beginning to end-of-study growth.

After each flipped module session, I had the participants complete a discussion board entry on our Schoology learning management system. These activities were designed for the participants to reflect upon the learning of each module, as well as a place to ask questions of me and the other participants. The topics, or questions, on each discussion board post dealt with the topic of the module of which they had just completed. Each participant posted a minimum of three times and were free to comment and question the other participants.

While the teachers were delivering their flipped lessons, I observed their lesson delivery and teacher-to-student interactions. Two class periods were observed, where I wrote down notes for each class. I briefly had the opportunity to answer questions and

provide feedback to the teachers after each class period. I chose to do observations so that I could see if the teachers were able to implement the flipped classroom model, including differentiated cooperative group work in their classrooms. It wasn't until these observations that I got a sense of how this could be coached as an instructional technology integration coach.

The fourth set of data was my reflective journals via our learning management discussion board. I posed three different discussion board prompts to serve as the platform for the journaling. I documented the participant responses to each of the three journal prompts. They were then coded for similar themes. Participant questions were also addressed through the discussion board. All participants were invited to comment on each other's entries within each discussion.

The fifth set of data that I collected was from the end-of-study interviews that I completed after the teachers flipped three of their lessons. A semi-structured set of questions was created when I prepared my IRB application package. I received feedback from the IRB reviewer. I tested these questions on teachers who have flipped their classrooms before, but did not participate in this study. The teacher participants spent 30-45 minutes with me discussing their flipped classroom experience. I recorded these interviews for later transcription and analysis.

### **Data Analysis**

The demographic information from each teacher was recorded at the beginning of the study. This was done so that I could organize my data according to each teacher participant. When the teachers read the IRB materials and signed the permission paperwork, I asked them about their educational background, age, and years of teaching

experience. A pseudonym was given to all teacher participants, in order to protect their anonymity for this study. I asked each participant to check what I wrote to ensure that it was accurate information.

I began the data analysis by looking at the pre-survey data. The survey had opened-ended questions, which were analyzed for qualitative analysis. I looked for common themes regarding participant goals for their participation in the study and what technology they were already using. I also used for quantitative analysis for close-ended questions, such as a list of tools was made and placed in our Schoology group on the LMS. At the end of the study I gave each participant a similar survey with the same quantitative questions. I compared the two sets of data. Because of this pre-study conference, I felt that initial trust with the teacher participants was established. This opportunity gave me chance to get to know the participants more than I already had prior to our study. Since five of the seven participants were new to the district this year, it was a nice experience to know them better prior to the beginning of the study.

After each module was delivered I posed a discussion board topic for the participants to use as a reflective journal prompt. The three discussions were analyzed using qualitative analysis, and common themes and patterns were noted. Students were encouraged to comment and ask each other questions on the discussion board.

During the classroom observations I took notes on each class that I observed. I included what the flipped task was prior to class and how the teachers used differentiation during their in-class activities. It was noted how many students completed the video prior to class, and how many students were in each group when it came to the differentiated

activities. Lastly, I kept track of where the teachers spent their time while working with the groups.

For the end-of-study interviews I recorded the meetings that I had with each participant, using the pre-approved questions from my internal review board application paperwork. The data was then transcribed. After the transcription I completed initial document coding by looking at categories and themes that occurred in the interviews.

### **Major Findings**

This section will include the findings that the study revealed from all of the data collection and analysis. This section will be organized by my original action research questions that I created at the beginning of this study. Throughout the research and data analysis I will explain how successful the flipped professional development was transferred to the teacher's classrooms by summarizing the classroom observations, participant discussion board, and exit interviews. Next, I will share the types of classroom activities and interactions that were present during my classroom observations.

### **Professional Development Transference**

There was clear evidence that the teachers gained a better understanding about flipping instruction from flipped professional development training. As a result, they could be able to transfer their learning into their classroom practice. For instance, prior to this study four out of the seven teachers stated that they had tried flipping a lesson, as analyzed from the pre-study survey, with a purpose of getting a quick answer about the background information about the participants. The open-ended question was also asked, "What do you know about the Flipped Classroom model?" All participants were aware that a video lesson was needed in order to flip a lesson, but no participants mentioned any

understanding of what happens during the in-class portion of the lesson planning or instruction.

When answering the question about the tools that could be used for flipped instruction, below is a list of technology tools that the participants stated they had used prior to this study.

Table 3

*Pre-Study Technology Tool Use*

<b>Name of Technology</b>	<b>Number of Teachers</b>	<b>Percentage of Teachers in</b>
<b>Tool</b>	<b>Who Used Tool</b>	<b>Study</b>
iPad Video Recording	6	85.7%
iMovie	5	71.4%
QuickTime	5	71.4%
Google Forms	5	71.4%
Kahn Academy	3	42.9%
Educanon/Playposit	2	28.6%
Schoology Discussion	2	28.6%
Board		
Online Polling	1	14.3%
Common Sense Media	0	0%

Knowing the technology tools the participants were comfortable using helped guide the third module of the professional development.

When analyzing the first discussion board question, which asked the participants to discuss what their goals or plans were for flipping their three lessons, only two teachers stated that one of the goals for their lessons was to provide differentiation, or a more individualized approach to teaching and learning. Teacher “F” stated, “We are currently analyzing the “main-ideas” of personal journeys in relation to two novels and their own lives beyond high school. I think that it would be a good opportunity to allow for differentiation between the students.”

Four out of the seven teacher participants mentioned in the discussion that they looked forward to creating video tutorials for students as an outcome of their learning and study on the Flipped model. Teacher “G” stated,

I hope to utilize flipped/blended learning for at-risk juniors and seniors -- specifically in studying abstract conceptual ideas in the novels *The Long Walk* and *Catcher in the Rye*. Ideally, videos will supplement key details from the assigned reading for the day, and students will spend class time discussing the ideas overviewed in the video and further reading.

From the responses of this question, it appeared that teachers were not fully aware of how the Flipped Classroom model transforms the teaching and learning of a classroom beyond video tutorials. Therefore, the first module of my professional development, which dealt with the basic process of the Flipped Classroom, brought about a new awareness of what the model can do for their students.

During the second module, which was mainly about in-class activities, differentiation, and the best use of face-to-face time, the teacher participants learned that they not only needed to plan for differentiation activities for the next day’s class period,

but how they could deliver those activities via technology. This professional development session was delivered in a flipped lesson that I created. During our meeting time, we discussed the importance of differentiation and how to accomplish cooperative group work within their high school classrooms. Since most of them had the background of teaching by lecturing, this was a change to their thinking.

From the second discussion board prompt, asking them to reflect on the flipped lesson that they received about differentiation, the participants had a better understanding about the in-class differentiation encouraged by the Flipped Classroom model. Four of the participants had a clear-cut plan to create differentiated groups and activities for their flipped lessons. According to the discussion thread, Teacher E posted “In math I think the flipped model will allow for more meaningful collaboration with classmates on math problems. I will be able to be able to group students with different assignments to meet their readiness levels. I will also be able to do more small group re-teaching, which is very handy in the lower level math classes.” For the three who did not mention that they had a plan, I was able to work with them further on what differentiation could look like for their classroom.

### **Classroom Practice**

During the observations of all seven teachers, it was clear that the participants understood the Flipped Classroom model. The teachers had a variety of video tasks for the students to do prior to the in-class portion of the lesson. The two math teachers used EduCreations to create math tutorial videos on radicals, which were uploaded to YouTube and placed in their Schoology LMS for students to view. Teacher “C” who had 11 years of teaching experience for math, chose to participate in the study because,

I get extremely frustrated with the amount of work I get from the majority of the students on a consistent basis and I think flipping my classroom in conjunction with making it self-paced would give them an incentive to work along with the tools and time to accomplish what is necessary from a school/Iowa core standpoint.

Teacher C created a lesson on the topic of simplifying radicals and had a structured set of differentiated group work for the students to experience the next day. The students worked on simplifying radicals in class. Those who understood the concept were put in a group to work independently. Those who did not watch the video were placed in a group to get caught up and begin the worksheet. Teacher “C” then let the remaining students decide which group they believe they belonged in for the worksheet activity. During the interview, Teacher C revealed, “I was surprised at the number of students who were not prepared for class, but it was nice to see the students who did complete their homework working together in class.”

Teacher “E” taught their lesson a week prior explaining what the quadratic formula was and how to use it in algebra. The in-class activity was very technology rich and differentiated. She brought in the use of song in order to understand and remember the formula using YouTube. The teacher began class with the video and a half slip of paper with a practice problem on it. Once the students had completed the quadratic equation problem, the teacher immediately checked their work and put them in a group for further practice. The teacher assigned the students which group they went to that day. They either worked independently to go further with the concept, worked in groups of

two to complete more quadratic equations, or the students who were struggling worked with the teacher to receive more structured instruction and re-teaching.

It seems that Math seemed to be a natural class to flip compared to the English lessons. The video lessons were very brief and structured, and the in-class activity was easy to differentiate by utilizing a quick formative assessment with a math problem. Students had no problems referring back to the tutorial videos when they were confused. The workflow was consistent and the observations that I made were very traditional as far as the Flipped Classroom model concept works.

The two English teachers flipped a variety of lessons. All English teachers incorporated QuickTime, iMovie, and Schoology. They also all contained a pre-class video and an in-class group activity, although the in-class activity varied widely in each classroom. Some group activities were differentiated, meaning they worked on a set skill, while other classrooms used the Flipped Classroom model to spark a more robust in-class discussion during the in-class time. More information about the individual observations is mentioned below.

The third module, focusing on technology tool use in the Flipped Classroom, reaffirmed the skills the participants already had, and introduced new ones. After professional development on Edpuzzle, Playpostit, Educreations, and Blendspace I was able to observe these programs being used within the flipped lessons in the classrooms. At the end of the study more of these tools were used as shown on Table 4.

Table 4

*Technology Tools Used in Flipped Lessons*

<b>Name of Technology Tool</b>	<b>Number of Teachers Used</b>	<b>Percentage of Teachers in Study</b>
iMovie	5	83.3%
QuickTime	5	83.3%
Schoology Discussion Board	3	50%
iPad Video Recording	2	33.3%
Google Forms	2	33.3%
Educanon/Playposit	2	33.3%
Blendspace	2	33.3%
Educreations	2	33.3%
Edpuzzle	1	16.7%

According to the participant interviews, four of the participants wanted to learn more about the different tools individually throughout our flipped professional development. For example, they thought it would've been more helpful to practice using each tool individually, and with more assistance. Teacher "A" stated, "I would've preferred that we learned each new technology and implemented it together instead of on our own." Three of the participants were comfortable learning the technologies on their own and at their own pace, and did not share this insight. Teacher "D" stated, "The

technology tools were easy to learn.” All technologies that were used to flip the lessons were done with competence, according to my observations, however.

Also through the exit interviews, I noted that the transference of the professional development to the classrooms was also evident beyond the use of technologic and the basic model. All of the participants have a plan in place to continue flipping different lessons in their classrooms, and have the desire to use different technologies. In fact, four of them have made appointments with me in order to help them set up new technologies like Edpuzzle and Blendspace. Teacher “C” stated, “I would like to flip my shared subject classrooms on Tuesdays because Wednesdays are a shortened schedule due to weekly professional development time. I will be making the video lessons and my co-teacher will plan the in-class differentiated activities. This will make better use of our shortened schedule.”

### **Classroom Activities**

The most fascinating part of this study for me, as the action researcher and instructional coach, were the classroom observations that this study allowed me to experience. As stated earlier, most of these participants were not frequent practitioners of differentiated group work in their classrooms. Learning about the Flipped Classroom model allowed them to explore different classroom routines, than they were used to or comfortable about implementing.

A few challenges emerged when I completed all fourteen observations and some of the participants attempted to turn these challenges into opportunities. The first noticeable challenge that I observed was that a lot of students did not come prepared for class, in that they did not watch the pre-class session videos. The Table 5 below, is a

sample of the total number of students in one in-class observation per teacher and the percentage of students who were unprepared to begin the Flipped in-class activities:

Table 5

*Student Preparedness*

<b>Teacher Observation</b>	<b>Total Number of Students in Class</b>	<b>Percentage of Students Unprepared for Class</b>
Teacher C	14	92%
Teacher G	8	75%
Teacher E	12	67%
Teacher D	26	61%
Teacher B	22	36%
Teacher F	6	0%
Teacher A	1	0%

When you are not prepared for a flipped classroom, the student has to take extra time to watch the video lesson in class. This was problematic for some cooperative group differentiated learning activities. The second observation that I made is that each classroom did not show measurable growth when it came to the percentage of unprepared students throughout the second full set of observations.

The teachers dealt with this challenge differently among the different classrooms. Teacher “C” made his students watch the short video before they moved into the differentiation activity. Teacher “G” had technological difficulties delivering the video via the LMS the day before. They also watched the eight-minute video prior to beginning

the class discussion. Teacher “E” had students who were unprepared begin with the in class formative assessment before the students were directed to revisit the video prior to entering a differentiated activity.

Another challenge that emerged from the observations was classroom management. This was not dependent on years of service, but study-wide. There were never any goals or expectations for group behavior established prior to group work. Teacher “D” who had 61% of students unprepared for class, allowed that group of students to form a big group on one side of the room. The group did not function on the video watching as the teacher had planned. Since the teacher was working with other groups of students, the unprepared group was not supervised and required redirection from the teacher often. This did not help the teacher work with the other groups who were prepared. Before the second observation of this classroom I mentioned that it might be better to keep the unprepared students in isolation, so that they could get caught up faster, with fewer distractions. This change was noticeable in the second observations.

Two of the English teachers flipped the same lesson on the book, *The Long Walk* by Stephen King. The goal was for the students to watch a video sparking interest in the concept of epigraphs from the novel, as well as the ending of the book. Instead of differentiated group work, the teachers took all of the students and placed them in a discussion group with the teacher leading the group. In one classroom this was a problem for some students. One particular student, during an observation, exhibited behavior issues at the thought of watching the video and working in a group. He was eventually asked to leave, but came back to participate in the discussion. The classroom dynamic of

watching a video prior to class, and then working in a large group, affected this particular student who was expecting class to be the status quo.

The last challenge that emerged was how the teachers determined the differentiated groups. Out of the seven teacher participants, only four teachers provided opportunities for differentiated in-class group work. The other three allowed the students to decide the differentiated group in which they would go to. Teacher “E” gave a formative assessment and made that decision for their students. This class did not have the choice to choose which small group of 2-3 students to work in and was very functional. They completed their assigned tasks, working closely together using a lot of dialogue, and two of these small groups were ready for more challenging practice from the teacher before the class period ended.

Teacher “C” divided their groups up by having students stand in a line at the front of the room. There were three indicators on a large line drawn on the whiteboard. These ranged from totally confused to absolutely confident, with somewhat knowledgeable in the middle. Once the students picked where they fit on the line scale the teacher allowed them to pick their group. The middle group was rather large, which did not allow for a lot of vocal interaction within the group.

Teacher “D” had a majority of students unprepared, but also had different group activities for those students who were prepared for class. There were three opportunities to choose from: work with the teacher, work independently, or work with a group of peers to practice the skill of summarizing and paraphrasing text. A majority of the students who went out into groups chose to work on the skills with their peers. This group had eight students in it. The level of participation was not high in this group. The

two students dominated the group, and four students never shared their input or got to share their thoughts or ideas. I suggested the teacher to divide the bigger groups into smaller groups for the next observation. The teacher took the advice from the researcher and the group flowed much smoother the second time.

### **Discussion and Implementations**

Back when this study was created, one goal was to close the gap between our availability of technology and its usage for instruction, while increasing differentiated classroom activities through the Flipped Classroom model. Another goal was to help teachers integrate more technology into their lessons, and also to improve student engagement. This study was able to work toward these goals.

There were limitations to this study, which are worth noting. First, the study only involved the English and math content area teachers. In this way it was very localized. There wasn't an opportunity to experience observations in other areas such as science, social studies, world languages, etc. The second limitation was that five out of the seven teacher participants were either in their first year of service or were starting their first year in our school district. Concepts like classroom management and small, differentiated group work planning skills are not as solid as a veteran teacher might be. The third limitation would be the number of participants. Working with seven teacher participants was manageable, but I feel the study would've yielded different results if there were more participants. The last limitation is that my close relationship with the participants and my dual roles as a researcher and instructional coach might project my personal bias when interpreting data and presenting the findings.

Although there were limitations, it is also worth noting the significance of the data collected, albeit not a large sample. The experience of the study and the data collection was valuable as an instructional coach of technology. As the researcher, I was given the opportunity to work with seven teachers, five of which were new to the district. This helped me form working relationships with these teachers that I hadn't had prior to the study. This in turn helped me strengthen my coaching relationships and allowed me to observe what happens in a flipped classroom.

During the observations and the professional development sessions troubleshooting was necessary in some instances. This study gave me the practice to troubleshoot not only technology issues, but classroom management and cooperative group work issues as well. The study provided some Flipped Classroom techniques that were not entirely successful in certain classrooms. For instance, one classroom teacher had problems helping the students upload the Flipped video content in order for the class to be prepared for the next day. The videos would not download. This was an opportunity to help coach the teacher in what to do as an alternative way to share videos with students.

When classroom management became an issue for Teacher "D" I was able to assess the situation and provide suggestions to the teacher prior to the next observation. These suggestions ended up making a difference for the teacher and the next set of students. Without experiencing how the Flipped Classroom model works, beyond just the professional development, I would not have realized that more help with classroom management and information needed to be built into the study for future data collection.

This research will be communicated with future participants of my Flipped Classroom professional development. I plan on doing a second round of this study with new participants in the coming school year. This research will also be shared with the school district administrators in an attempt to bring about more awareness to the Flipped model and for the coaching that it takes to help it be successful. This summer the research will be presented at a technology conference here in Iowa as well for the promotion of the model and the coaching component as well.

I believe this research will continue to fill the research gap for Flipped Classroom professional development and transference to the classroom for the high school level. Not much research has been done on the effectiveness of the Flipped model in K-12 education. Much of the current research is done at the collegiate level. If this study is repeated two to three times, I believe that the research will benefit those teaching and instructional coaching secondary educators and coaches.

### **Recommendations**

Due to the fact that our school district administration desires our teachers to integrate more technology into their lessons, as well as provide students with differentiated collaborative group work, this study helped teachers do both. I recommend that our district invest more time and resources discovering how the Flipped Classroom model can help foster a rich technological environment with opportunities to help all learners succeed. More professional development must be provided in order to equip the teachers to have the skills to not only use the technology tools, but to learn how to create and facilitate differentiated activities and small group work. Learning the classroom management differences between the Flipped Classroom

and the traditional classroom is also important. I propose that a fourth module be added to this study that covers establishing expectations, classroom management, and troubleshooting the unexpected with technology. More options for how to share videos needs to be researched and communicated to teachers.

A recommendation for teachers would be to practice video creation that is engaging for the learner. Using programs such as EdPuzzle or Educanon can help the student stop and reflect upon what they are watching. The teacher will also have a clearer picture of which students are watching the videos, as well as the students who don't understand the concept(s) from the videos.

Including more participants from our school, as well as other schools that are one-to-one environments, would strengthen this research and data collection. More academic content areas participating in this research could strengthen the study's relevance for more teachers to become involved.

### **Reflection and Conclusion**

The Flipped Classroom model can be transferred from professional development to the classrooms when the professional development itself is delivered with the Flipped model concept with the on-going support from an instructional coach. The teachers experienced the Flipped model before they had to design Flipped instruction lessons for their students. Technology integration coaching was remarkable help during the process to ensure that the teacher was designing and delivering the Flipped instruction with support, whether that support was technology guidance or planning differentiated small group work.

More research needs to be done on how to boost classroom management and accountability for the students in the Flipped classroom, by the researcher, in order to create a fourth module of this training program. This will help teachers set a clear purpose for the flipped instruction for the students, and provide the teacher with accountability routines for students who do not watch the videos prior to the in-class sessions.

Setting clear purpose for group work also needs to be revisited by the researcher. Since the teachers had not done a lot of lesson plans involving small group work in their classrooms, students were unclear of the teacher's expectations for their group behavior. By including this to the fourth module, teachers and students will have a clearly defined way to establish purpose and routines for group work.

The last reflection that I have made is that more time may be needed to learn and practice the technology tools needed to flip classroom lessons. The flipped professional development provided them with the technology tools as options, but did not go through them and explain how they work in a step-by-step manner. Many teachers were able to navigate the technologies on their own, but some teachers suggested to the researcher that having more face-to-face sessions about the tools would've been helpful.

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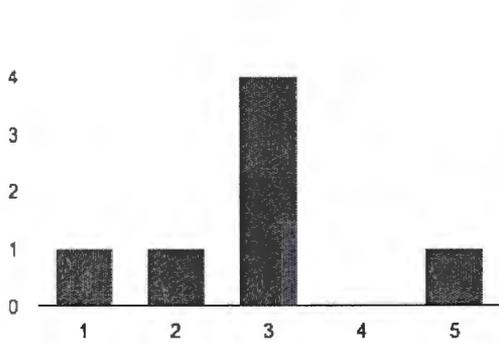
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**Appendix A**

Pre-Study Survey Information

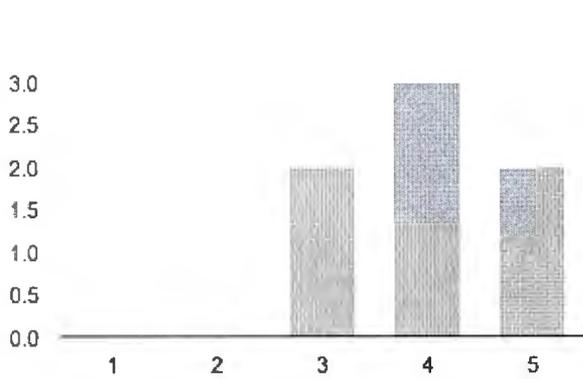
1. How comfortable are you with creating videos of your lessons?



I have never captured video of my lessons.:	1	1	14.3%
	2	1	14.3%
	3	4	57.1%
	4	0	0%

I feel confident that I know how to video myself teaching.:	5	1	14.3%
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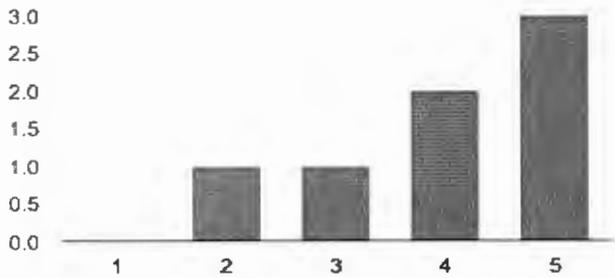
2. How comfortable are you with creating differentiated activities for your students to do in class?



No comfortable at all:	1	0	0%
	2	0	0%
	3	2	28.6%
	4	3	42.9%

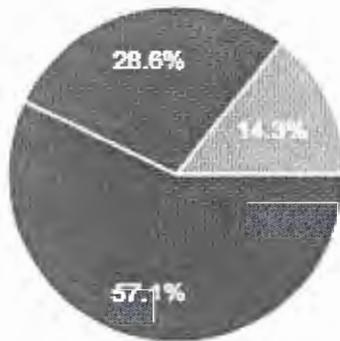
I feel very comfortable with this:	5	2	28.6%
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3. How comfortable are you with students working cooperatively in groups during your class?



No comfortable at all: 1	0	0%
2	1	14.3%
3	1	14.3%
4	2	28.6%
I feel very comfortable with this: 5	3	42.9%

4. Have you ever flipped a lesson before?



Yes	4	57.1%
No	2	28.6%
Maybe	1	14.3%

5. What do you know about the flipped classroom model? Please briefly describe your experiences.

(Answers given and then transcribed)

6. What would you like to learn through this process? What are your goals for me?

(Answers given and then transcribed)

7. Please check the programs you have used from the list below:



## **Appendix B**

### **Discussion Board Journal Prompts**

1. **Discussion Board Prompt 1** “Please discuss below how you plan to utilize the flipped classroom model in your classroom. You can reference specific lessons or a unit of study that you plan to work with. Also, please ask one clarifying question that you have about the flipped classroom model process. This can be about the technology, the model, or the in-class activity part. Please feel free to respond to one other group member this week.”

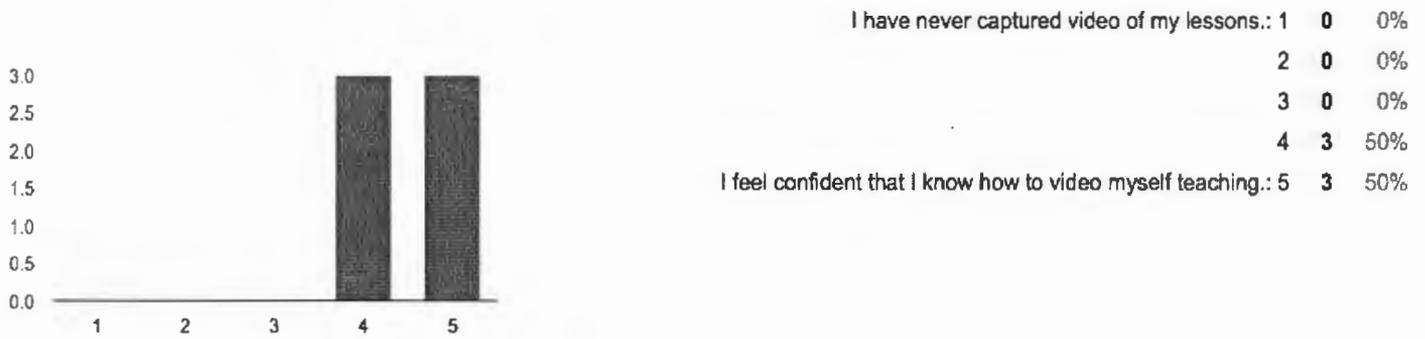
2. **Discussion Board Prompt 2** “This session was on your best use of face-to-face time. How do you see your classroom class time differently with a flipped lesson? What strategies and activities have you thought about using? Do you have any other questions on face-to-face time or differentiation for your classroom?”

3. **Discussion Board Prompt 3** “What technologies from our session did you use for your lessons? Please share your successes and most importantly, your frustrations with these technologies.”

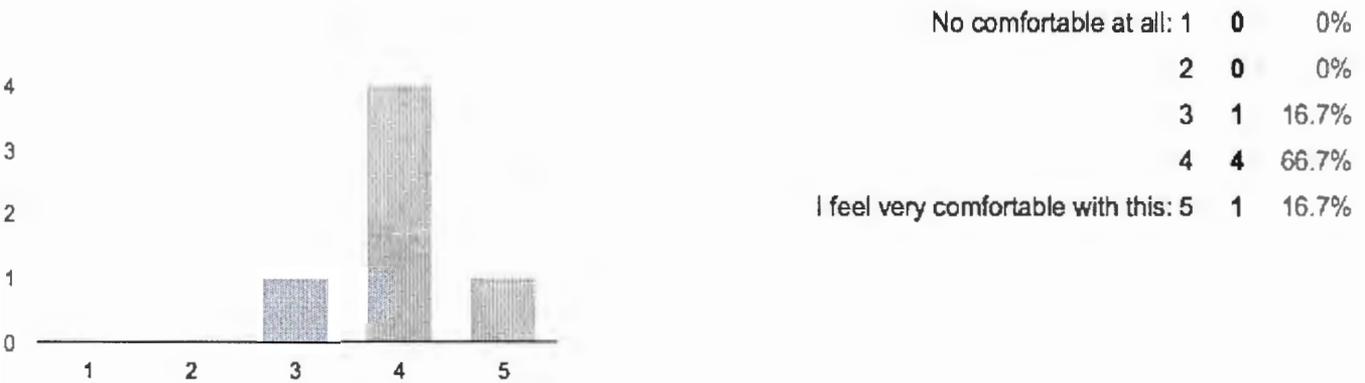
### Appendix C

#### End-of-study Survey Information

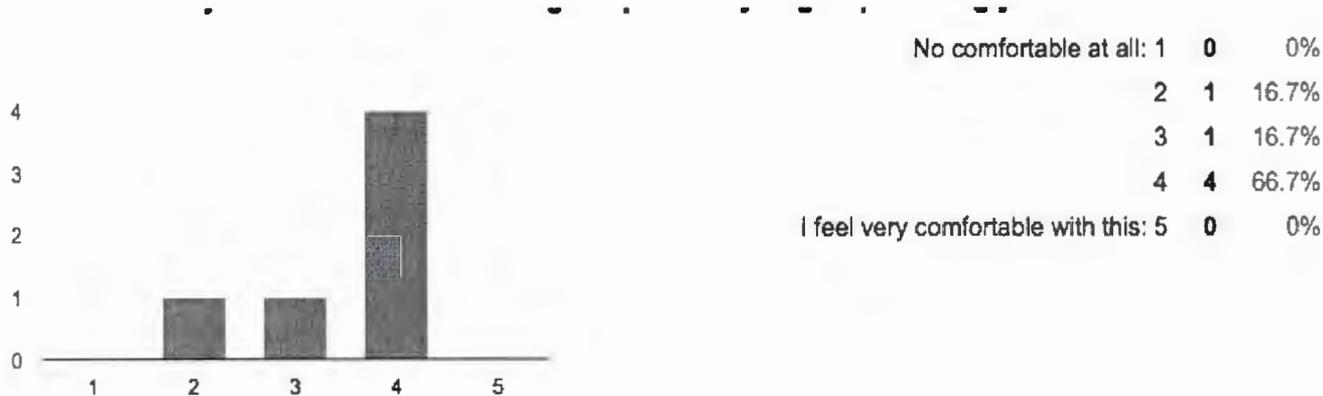
1. How comfortable are you with creating videos of your lessons?



2. How comfortable are you with creating differentiated activities for your students to do in class?



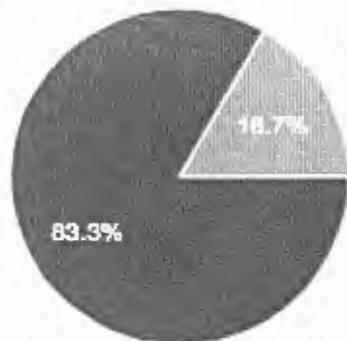
3. How comfortable are you with students working cooperatively in groups during your class?



4. What did you learn about yourself when using the flipped classroom model? Please briefly describe your experiences.

(Answers given and then transcribed)

5. Were your goals for this study met?



Yes	5	83.3%
No	0	0%
Somewhat	1	16.7%
Other	0	0%

6. Please check the programs you used from the list below:



iMovie	5	83.3%
Kahn Academy	0	0%
Quicktime	5	83.3%
Common Sense Media	0	0%
Discussion Boards in Schoology	3	50%
iPad Video Recording	2	33.3%
Online Polling	0	0%
Google Forms	2	33.3%
EduCannon	2	33.3%
Blendspace	2	33.3%
EdPuzzle	1	16.7%
Educreations	2	33.3%
Other	0	0%

## **Appendix D**

### Interview Questions

#### Pre Professional Development Questions:

1. Identify the gaps in your teaching practices relating to differentiation of instruction when it comes to teaching and learning.
2. Identify any technology integration barriers that you have in your classroom for teaching and learning. (I.e. video, learning management system, web 2.0 tools, etc.)
3. What do you hope to achieve by participating in this flipped classroom model study?
4. How would you rate your knowledge of the flipped classroom model? (Likert Scale)

#### Post-Professional Development Questions

- Questions after the participants learn about the flipped classroom model:
  1. Report on the effectiveness of this activity: how did it change your personal understanding of the model?
  2. In what ways will you be able to use this model for additional learning activities?

3. In what ways might this training be utilized to increase staff critical thinking, applying knowledge, enhancing social opportunities, and scaffold professional learning?
  4. What about the role of flipped professional development in this study? Did you enjoy it? Or was the flipped PD a hindrance? Please explain.
- Questions after the teachers deliver at least three flipped lessons to their students:
    1. In what ways did differentiation change for your students?
    2. Describe how prepared you were to deliver your three lessons.
    3. How would you rate your knowledge of the flipped classroom model? (Likert Scale)
    4. In what ways will you continue to use this model in your future teaching practices? Conclude your reflection by connecting your thoughts and experiences to the usefulness of the flipped classroom model in your content area and classroom.