



**THE UNIVERSITY  
OF THE ARTS**

**Exploring The In-Class Flip In The Elementary Orchestra Classroom**

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Capstone Action Research Project

Submitted in Partial Fulfillment for a degree in Educational Technology

At

The University of the Arts

April 23, 2020

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### **Abstract**

This study explores the extent to which student achievement differs between an “in-class flipped classroom”, with a station rotation and a traditional lecture method in an elementary orchestra setting. This project was guided by the question, how is learning different between these two approaches? Due to challenges with existing flipped learning, such as lack of devices, understanding and follow-through, the researcher wanted to explore flipped learning within the confines of the classroom. A control group received the “traditional approach”, while a treatment group received the in-class flipped model. This involved students in fourth and fifth grade who all were new to their instruments the school year it was implemented. Pre and post-test data were collected from both groups and compared to determine if there were any differences between the two ways of learning in relation to student achievement. T-tests were performed on the posttest scores and no significant results were obtained. The size of the participant sample may have been a factor. The instructor indicated the in-class flip allowed more oversight with students, equity in terms of technology and better pacing to the lesson. The results from this study indicate that more research with larger samples of both the control and treatment groups would be necessary to better determine possible trends.

*Keywords: flipped classroom, in-class flip, elementary orchestra, music education, pull-out program, traditional lecture format*

## **Exploring The In-Class Flip In The Elementary Orchestra Classroom**

### **Background**

Students in this program started playing an orchestra instrument this school year, starting in the fall or winter. Despite a similar start time, the students' abilities and levels varied widely. While some appeared to have a good understanding of concepts and were reading ahead in their lesson books, some struggled to identify notes or play using good technique. Flipped classrooms are often recognized as an area where new content is delivered outside of class time and the work, labs or homework are done during class time with the teacher. This study explores an in-class flipped rotation, where content is delivered via a video during class time before students move to stations to practice the new content while a teacher moderates. Using an in-class flipped station rotation gives the opportunity for students who are struggling to review material at one station, while also allowing others who have been progressing more quickly to move at a faster pace. All students have the option of determining what station they go to, what order of the stations to go to, as well as the opportunity to work ahead on music.

This orchestra program is a pull-out program, the result being students come out of other subjects to attend lessons. Because this program operates on a rotating schedule, students frequently lose track of time and arrive late, meaning portions of instruction have to be restated for the late arrivals. This disruption in a traditional format has a tendency to slow or halt the pace of the lesson, reviewing concepts for all when not all students require them. Less time to review new material means some material is dropped that week, leaving that group further behind. In the flipped format, late arrivals would have the opportunity to watch a short video on the lesson

content while those who arrived on time could continue to move through stations, meaning the activities wouldn't lose the momentum they do in a traditional format. In addition, a teacher walking between stations has a better opportunity for checking in one on one for understanding while not stalling the whole lesson as can happen in a more traditional lesson. It gives the teacher the potential to streamline and make better use of the short amount of time allowed for instruction.

In the flipped classroom, by allowing students more input in how they progress, they are given more of a part in the decision making, something that they have less opportunity to do in a more traditional lecture format. While both classrooms involve activity and rehearsal, students in the flipped format have more control over the pace and sequence than those learning in a traditional lecture context. The content remains the same while the approach changes based on what and how each student progresses through the stations. The constructivist learning theory states that allowing students more voice in how they learn gives more meaning to what they learn. By giving students choices, they potentially become more engaged.

Flipped learning in a traditional sense has not been as effective at this elementary school. While students are assigned examples to record using Flipgrid or assignments to complete after viewing the teacher's website, most do not fulfill these assignments for various reasons, such as lack of technology, confusion with how to complete the assignment or forgetting. Placing the flip within the classroom means a teacher can intervene if there are questions and it gives all students the same technology from which to work.

Finally, having the initial content set up in a video presentation means not only is each student receiving the same exact presentation, but the teacher has less vocal wear and tear. As the instructor in this situation suffers from vocal nodules that come and go, less time spent introducing and reiterating new lesson concepts means potentially better vocal health.

### **Problem Statement**

Student achievement in orchestra pull-out lessons is negatively affected by student absence and lateness. The extent to which employing an in-class flipped classroom with station rotation results in achievement differences for first year orchestra students has not yet been examined in this school. The instructor has the task of teaching desired content in a brief window of time when students come to lessons or to their large ensemble on time. Because there is a limited amount of time the teacher sees the students, class time is compromised when students forget to come, are held in class to complete an assignment or are late to class. An in-class flipped classroom with station rotation, referred to here as an “in-class flip” has the potential to allow the instructor to teach content to meet the needs of a student. Where students in the traditional setting are learning information all together at the same pace and in the same order, students in the in-class flip have the opportunity to move at their own pace. They also are given the ability to choose what station to go to and those students arriving late can catch up without compromising every student’s class time.

### **Research Questions**

How does using an in-class flipped classroom impact how students learn content?

- Does one of the groups appear to progress through the curriculum at a different pace than the other?
- Do students in one group appear to have a better understanding of the new content based on the data?

### **Action Research**

The research method for this design is action research, using quantitative assessment methods. The focus would be on how students learn differently from a more traditional learning method and an in-class flip. Students are compared between the two methods. The first method is the traditional method often referred to as “lecture-style” method of instruction. The second method of learning is called an in-class flipped rotation in which students learn content via a video and then move from that to stations, with a teacher acting as a moderator. In order to collect data, students were given a pre-test and post-test, playing tests, as well as melodic and rhythmic exit tickets. Comparing a traditional lecture format with an “in-class flip” allows the teacher to look for differences between the two learning styles.

### **Definition of Terms**

*In-Class Flip* - refers in this project to the method of instruction where students learn new content at the beginning of class via a video and proceed to stations to practice this and new content.

*Traditional Lecture Format* - instruction where teachers present information and convey knowledge to students through speech or lecture and where students often play a more passive role



*Pull-out program/lessons* - this instruction takes place when students are pulled from their regularly scheduled class time to attend a small group lesson or ensemble practice, in this setting orchestra.

*Small group lessons* - smaller groupings of 4-8 students, sometimes divided by instrument (i.e. violin, viola or cello/bass group)

*Large ensemble/full orchestra* - the time during which all violin, viola, cello and bass students meet together to rehearse as one large group

*Melodic exit tickets-exit tickets* - where students are asked to answer questions regarding a melody or individual notes

*Rhythmic exit tickets* - exit tickets where students are asked to identify or perform different rhythms.

*Pizzicato* - to pluck an instrument using one's fingers to produce sound

*Arco* - to use a bow on the strings of an instrument to produce sound

### **Literature Review**

Within the elementary orchestra classroom there is limited time to deliver course content in this district. Most elementary orchestra teachers see their students once a week. They often teach multiple levels of learners at the same time in a situation where students are pulled from their other classes, generally referred to as “pull-out”. In addition, students frequently come at the same time, making it necessary for the instructor to call homerooms for students or re-teach portions of the lesson as students arrive. Furthermore, students are learning in a more traditional format. While they are engaged with playing their instruments, they have less of a role in how the lesson unfolds. An in-class flipped rotation refers to a method of instruction where content is delivered via a format like video, podcast or screencast, after which students are given the option of rotating through different stations at their own pace and in the order they choose to practice and reinforce the main content. The teacher acts as a moderator through this, circulating, answering questions and helping. This method could help to maximize productive class time, allowing students to control pacing, how often they re-watch or review the initial content, as well as give students some control and choice in the order of their instruction. Additionally, this would give students who miss instruction the option to catch up and practice new content with videos at home. While many studies focus on students at the secondary or college level, this study would focus on elementary aged students. The research question guiding this study is “How does using an in-class flipped classroom impact how students learn content?” The purpose of this literature review is to study what kind of changes occur between an in-class flip and

traditional teaching within the environment of an elementary orchestra classroom, focusing on first year students in grades four and five.

### **The Constructivist Learning Theory**

The constructivist learning theory puts forth the thought that encouraging students to use active techniques, such as experiments and real-world problem solving, creates more knowledge or learning (Olusegun, 2015). By learning this way, Olugesgun (2015) states proponents of the constructivist theory claim students are able to give feedback and talk about what they are doing and how they start to process things differently. In this setting, the teacher acts as a guide or a facilitator. In order for this approach to work, students must have a base of knowledge in the subject on which to build new understandings and connections (Olusegun 2015). The constructivist theory requires students to take a more active role, not simply receiving information from a source but participating in the learning process in an active and exploratory manner during class time (Mercurio Santos, 2018). Looking at it through the lens of flipped learning, students are using constructivist principles. For instance, instead of a lecture format, if students are given an instructional video for content, they can re-watch it, pause it; they have control in how they pace their learning (Grant, 2013). In a station rotation model, they can choose which station to attend next, allowing them a choice in the order of what they're learning. By giving up the lecture format as a largest source of teaching content, instructors open up their classrooms to more diversity in materials and different potential outcomes than one might find in a more traditional lecture format (Grant, 2013).

### **The Flipped Classroom**

The concept of the flipped classroom was co-founded and popularized by two high school teachers, Jon Bergmann and Aaron Sams in 2007 (Bergmann & Sams, 2008). Bergmann and Sams started by creating podcasts and vodcasts for students who had been absent, were struggling or to be used as instruction with substitute teaching plans. After recording some of these lessons, they realized they could change their process of instruction, allowing more teacher/student interaction during labs and give students more time to ask questions regarding any areas they needed help. The term flipped classroom often meant there was a pre-class learning phase where students learned content outside of class time.

Instructors who favored the flipped method of instruction often wrote of it in relation to Bloom's Taxonomy (Punongbayan & Acelajado 2018). Bloom's revised taxonomy, provides six levels of learning: remembering, understanding, applying, analyzing, evaluating, and creating (Anderson & Krathwohl 2001). As Olugesgun (2015) states, constructivism encourages more active learning, experiments, labs and problem solving, this further promotes the idea that flipped-learning is a good way to encourage engaged learners. By flipping the classroom, instructors place Bloom's lower two levels, remembering and understanding, in the flipped format, allowing them more time to implement Understanding, Applying, Analyzing, Evaluating and Creating during class time. Positive attributes that were highlighted regarding the flipped learning approach were more engaged students, collaborative environments, improved test scores and responses of students and teachers themselves (Grant 2013, Duker, Gawboy, Hughes & Shaffer 2015). A study at the University of North Carolina looked at doctoral pharmacology students' exam scores over the course of a three-year study. This study indicated that final exam

scores improved 5.1% over a two year time period using a flipped model of learning (MacLaughlin as cited in Duker, Gawboy, Hughes & Shaffer, 2015.) When responding to a survey at the end of the course, 91% of the students reported that flipped learning improved their learning experience (MacLaughlin as cited in Duker, Gawboy, Hughes & Shaffer 2015.)

At Stanford when instructors compared flipped classrooms to those classrooms with a more traditional format, their data showed the average test scores increased as did attendance rates (Prober & Heath as cited in Merlin, 2016.) The instructors noted test scores increased from 41% to 74% and students' attendance improved from 30% to 80% (Prober & Heath as cited in Merlin, 2016.) In their study, *Comparison of Student Performance, Student Perception, and Teacher Satisfaction with Traditional versus Flipped Classroom*, Unal & Unal (2017) focused on 16 teachers all new to the flipped classroom method of teaching. The authors looked at the impact of flipped learning on teachers and their students in grades 4-10 over the course of a 5 day week using both a traditional model of classroom instruction and the flipped lesson approach. Due to the number of teachers involved, the authors of this article also looked at a wide variety of subjects. *Use of the flipped classroom instructional model in higher education: instructors' perspectives*, Cummins, Long and Waugh (2016) involved eight volunteer faculty members at a large research university in the Southeastern US who were trained in a Summer Teaching Institute sponsored by the Teaching and Learning Center at a large research university in Southeastern US. Four of these instructors taught using the flipped method of instruction, while the other four did not use the method yet. Based on qualitative interview data, results showed that no obvious differences existed. Among the things teachers liked about flipped

learning were, (1) Students could work at their own place, (2) Students could do their “homework in class”, giving teachers a better idea of where students excel and have difficulties, (3) teachers could better adjust and update curriculum and provide it to students at any hour, (4) classroom time could be better utilized, (5) teachers using the method reported increased levels of student achievement, interest, and engagement, (6) their learning theory supports the new approaches, and (7) using technology that is flexible and appropriate supports 21st century learning (Unal & Unal, 2017.) In other words, in-class time was then spent doing more active learning such as labs, role play, problem solving, creating projects, putting what was learned into practice and the more passive parts of learning, such as lecturing were kept to time outside of class (Cummins, Long & Waugh, 2016.) Of the teachers involved in Unal & Unal’s (2017) study 93.75% felt their students learned better and scored higher using flipped instruction and 81.25% of these instructors felt it better enabled them to interact with their students. As an instructor from Cummin, Long & Waugh’s (2016) study said, flipped learned helped, ‘allow for much deeper delving into the learning content than using class time to go through the presentations.’’ The students “‘had no longer listened to others’ presentations as an audience,’’ but “‘engaged into more intensive and detailed discussions about what each presentation said’’(p. 8).

While initially used in the chemistry classroom, flipped instruction has been utilized in many different areas since and recorded positive results. In Salim Sever and Gülşah Sever’s (2017) study regarding students’ self-assessments they followed 98 college students studying to be teachers. Sever and Sever (2017) used a pre-test and post-test model to evaluate growth in a

music performance setting. After the flip application, the difference between students' own scores and the performance evaluation scores of their teachers significantly decreased. The authors felt this showed that in using the flipped learning model, students developed a higher level of awareness regarding their playing ability and performance, meaning students rated themselves at a lower level because they were listening more critically to their playing after the flipped portion of the instruction.

Similarly, Zhang et al (2015) also felt their study of fourth graders using math apps to close the achievement gap showed positive results as a result of flipped instruction. After giving a pre-test and two post-tests, the researchers noticed less of a difference in data between children who were struggling in the classroom versus those who were learning as anticipated. Both of these studies used quantitative data. Sever and Sever (2017) collected data based on college students' self-reflection. Students gave themselves numerical scores on their piano technique both before and after watching an instructor or professional demonstrate piano technique on a video. Zhang et al (2015) collected their data from test scores following the flipped lesson. While both studies could have been longer and collected more information, the authors of each were positive about the upward trends they saw in their data collection.

Longitudinal or longer term studies also exist that highlight positive results in flipped instruction. Mecurio Santos' (2018) action research study focused on seven music theory supplemental instruction leaders over the course of a year. All of these instructional leaders had completed four semesters of music theory as well as 16-40 hours of service for this project. Over the course of two semesters, Mecurio Santos (2018) used a mixture of qualitative and

quantitative methods to gather data. The researcher looked at how the supplemental instruction leaders varied their strategies of teaching in the flipped classroom design versus the traditional lecture approach. The study collected data to determine if instructors changed their process from spring semester 2017 to spring semester 2018 when given a website from which to work; the researcher collected lesson plans from instructors to compare from each spring semester as well as conducting interviews for the qualitative data. Santos (2018) found an increased use of different strategies at the conclusion of the 2018 compared to the 2017 Spring semester.

Segolsson, Hirsh and Bäcklund (2017) also did a longer term research study in Sweden over the course of an 18-month period with students in year six (equivalent to 8th grade in the US), observing and interviewing both teachers and students periodically during this time period. The study gathered qualitative data from three teachers and 22 students via 11 observation sessions, 42 student interviews and 10 teacher interviews. The observations were open observations, which determined what abilities students developed and how their way of working at school changed and if they developed problem solving abilities. The researchers concluded that this method worked well if there was support from the school and teachers were trained for the flipped method. They also found, based on the qualitative data, it was a positive experience for most of the students; they felt their research showed students became better motivated and their school work increased. The proposed procedure at the end of this review will not have the benefit of a longer timeline, however, looking at the conclusions from these two studies helps to inform it; support from the school is highlighted as key in Segolsson, Hirsh & Bäcklund's (2017)



study, as is the training method, which is also highlighted in both their study and Mercurio Santos' research (2018).

While there is a lot of positive support surrounding the flipped classroom approach, criticisms exist as well. Included among criticisms are; students don't complete the at home assignment and are unable to take part in the class activity, some students don't have the access to view videos and it takes instructors considerably more time to make videos and lesson plan compared with the traditional approach to teaching (Segolsson, Hirsh & Bäcklund 2017; Unal & Unal 2017). In his article, Roland Sparks (2013) focused on what a flipped classroom looked like, and sought to answer if there was an increase in learning using the flipped classroom methodology. He felt not enough research had been done with enough data points to determine if there were positive effects regarding flipped instruction. His research included 27 freshmen, college students under controlled conditions. Sparks used both qualitative and quantitative measures to gather data from both the students and their instructors. Using data gathered from pre-tests, post-tests and student surveys, Sparks felt the scores supported the idea that flipping the classroom was not beneficial for all in the class. While students self-reported the flipped classroom increased their understanding of the material, his data showed "81.5% of the students showed no improvement and 3.7% showed lower test scores after using the flipped classroom method" (Sparks, p. 6). He concluded there was conflicting data between what students self-reported versus their actual results. Sparks concluded the increased time students spend reviewing information via the technology was more significant to student learning rather than the flipped learning setting. To that effect, Bergmann and Sams (2008) noticed nominal growth in

their comparison of scores of state science tests from Spring of 2007 to 2008, potentially suggesting not the large gains others might project. In light of Sparks' (2013) and Bergmann and Sams' conclusions (2008), careful consideration should be given to how much time students are spending on the flipped technology portion of the lesson. Quantitative and/or qualitative data taken by instructors is also important to the research, rather than relying solely on student self-reporting on success.

### **The in-class flip**

The "In-class flip", coined by Jennifer Gonzalez in 2014, has shown the potential to combat some of the concerns of the traditional flipped method (Ramirez & Rodriguez, 2018.) This particular model was presented as an alternative to the traditional flipped method approach. It allowed teachers the option of flipping content within their classroom using an in-class flipped-material station/rotation format. For those critical of the traditional flipped instruction approach, this method alleviated some of the concerns, such as students being unprepared or not having access to technology (Cummins, Long & Waugh 2016.) Additionally, teachers could observe students watching the video content giving more opportunity to help students better understand the lesson. In this learning model, students learned their video content in class and follow-up was either in station rotation work within the classroom or non-station work. The teacher became less the main "content provider" (Ramirez & Rodriguez, 2018, p. 135) and became more of a guide or facilitator. Andrea Ramirez referred to these two approaches as "mixed sequence" and "simple sequence" (Ramirez & Rodriguez, 2018, p. 136). In their article "In-Class Flip in Teacher Education Through Loop-Input", Ramirez & Rodriguez demonstrated

an in-class flip using the station model with teachers at the ASOCOPI (Asociación Colombiana de Profesores de Inglés) conference (2018). Used as a method to teach teachers about the in-class flip, they demonstrated the flipped rotation during this conference in a loop method. In a separate study, Ramirez worked with Liz Diaz Munevar (2018) in their research report *In Class Flip: Triggering Second Graders Self- Regulation* to implement an in-class flipped rotation format in an elementary setting for 25 female, second grade students at a trilingual institution in Bogata. Using a station rotation format, they used this process to create better self-regulation. The strategy selected to address the problem proposed a shift towards a student-centered classroom in elementary education, a transition from the teacher-centered environment. Their data included narrative texts, a teacher's journal, student surveys, exit tickets, a satisfaction survey and focus groups. Based on survey data Ramirez and Munevar (2018) collected, 99% of the students answered activities were student-centered and 95% of the students saw the teacher as a guide who supported them and gave feedback. Based on journal writing the teacher did, Ramirez & Munevar (2018) felt the instructor indicated students were better able to work on their own after they realized they could revisit material being learned. The authors indicated this closely connected to the ability of self- monitoring and that it was promoted by the student-centered atmosphere. They concluded that a student-centered atmosphere improved self-regulation, however, first there must be a change in teachers' mindset; careful planning and thoughtful consideration of students' needs and interests needed to go into lesson preparation.

Using the in-class flip model and comparing it to a traditional flip model in the math classroom, Miguel C. Punongbayan and Maxima J. Acelajado (2018) took a different approach

in their report *Effects of the Traditional Flipped and the In-Class Flipped Classroom Models on the Students' Performance in Geometry: A Comparative Analysis*. Using a pre-test/posttest model, the authors took two sections of thirty 9th grade students from Statefields School, Inc., during the 2017-2018 school year. The instructors used a random assignment method to determine which students were in the control group and which students would be in the treatment group. The control group was taught using the traditional model of flipped instruction while the experimental group was taught using the in-class flip method. Throughout their twelve weeks of study, both groups received the same classwork, group activities and the assessments. The only part that varied for the two groups was the method of flipped instruction. The instructors recorded that 27 students in the traditional flipped classroom and 25 from the in-class Flipped Classroom improved in the post-test. The researchers looked at the means and the standard deviations of the pretest and posttest scores of the respondents, as well as the result of the paired samples t-test that compared the pretest and posttest mean scores of the respondents in the In-Class Flipped Classroom to the respondents in the Traditional Flipped Classroom. Based on this and the frequency distribution of the posttest scores of the control and experimental groups, which showed the difference of 0.67 in the mean gains Punongbayan and Acelajado (2018) determined the difference was not sufficient to conclude that the respondents participating in the Traditional Flipped Classroom Model performed better than those taking part in the In-Class Flipped Classroom Model. With the mean gains of 6.03 for traditional flipped instruction and 5.36 for the In-Class Flipped Classroom Model, the researchers concluded that both methods showed similar growth and that learning occurred in both methods of instruction. As they felt

their research evidenced growth of knowledge and similar rates of learning in both cases, the authors recommended both methods as effective.

### **Literature gap**

In researching the flipped classroom, there were more examples of a flipped classroom within the secondary or university setting than within the elementary classroom. There were few examples of flipped learning with research within a music setting and no examples of a traditional or in-class flip in the secondary or elementary orchestra setting. In addition, there were very few examples of action or empirical studies that could be accessed that detailed an in-class flip. There were no empirical or action research examples of an in-class flip within any setting of the music classroom. This said, those elementary classrooms that took part in flipped instruction, overall reported positive feedback from teachers and students. Students as young as second grade took part in an in-class flip with perceived success (Ramirez & Munevar, 2018). While students in the elementary orchestra classroom don't tend to meet as frequently, this model provides the same potential for success and growth in a different elementary setting. It also provides students the opportunity to learn in a more active, student centered learning environment as high-lighted in the constructivist learning theory.

Considering the nature of the music setting, and the fact that most elementary level co-curricular teachers see their classes one time a week, an in-class flip appears to have the potential to provide students with more time with content, more opportunity to review concepts and additional time working through challenging areas with teachers. As elementary students are often given a more traditional approach to learning, having an in-class flipped lesson plan format

gives teachers more opportunities to watch and guide students through a potentially new or less frequently used learning process. It also gives teachers more time to interact with their students as they learn new content, providing more time for feedback.

Using an in-class flip also ensures all students complete the necessary flipped content and gives equal access to technology for all students, two things that are often highlighted as drawbacks to the flipped method of instruction (Unal & Unal, 2017). This gives students more voice to how they learn, what station they go to next, how often they watch a video for understanding, gives them more choice in the way or process in which they learn. This could help encourage engaged learners and student ownership within the classroom. Like any classroom, the elementary orchestra classroom is filled with multiple types of learners with varied strengths. Using an in-class flip could change the way or approach students take to learning and potentially help streamline procedures in the classroom. Those that come late to class could still access the same material, allowing for different pacing of class activity. Because there is no data that speaks to flipped learning in the elementary orchestra classroom, few examples of an elementary in-class flip and again, no examples of in-class flipped learning within the elementary orchestra classroom, this area seems like one to further research.

## Methodology

### Participants

Participants in this study included 29 students in fourth and fifth grade, between the ages of nine and eleven at an elementary school in the mid-Atlantic region of the country. All were enrolled in the orchestra program and all were students in the first year of their instruction at the same elementary school. This study took place during their regular 30 minute class period once a week from early March until mid March; it was intended to go until early April. Half of the students in the study learned using a more traditional lecture approach and the other half learned using a flipped-classroom station rotation format. Data were collected during each class and compared between the two methods of study to determine if there was a difference in learning between the two. Students in the school were from a wide variety of ethnic and socioeconomic backgrounds. Students met in small group settings of four to eight students throughout the day during which time data was collected. All of the students participating were students of the instructor administering the study.

### Materials

For both methods of instruction, the researcher used a pretest to determine base knowledge. Both those learning using the traditional method and those learning using an in-class flip also used their instruments (violin/viola/cello/bass), and computer/iPads to record playing examples. Playing examples came from rhythm sheets the teacher created, existing melodic/rhythmic examples from their lesson book *Essential Elements book 1* and examples from their concert music (see Appendix A for examples). Data were recorded using a

quantitative approach with students filling out closed answer questions. A playing rubric was used to evaluate all performance examples (see Appendix B). Pretest data included note identification, filling in musical terms and a playing test. Posttest data were collected in a playing test example (see Appendix C).

### **Ethical Considerations**

Because this study involved students under the age of 18, assent was garnered from the students and consent granted from a parent or legal guardian to take part in the study. Information was presented to students using grade appropriate language so that they understood what the study entailed as well as their part in it. Students could technically be considered a captive audience, however they were informed that their participation was not mandatory (see Appendix D).

Once assent/consent forms were submitted and returned, the forms were split into two groups, containing equal amounts of students from the gifted and regular classrooms. Students were already assigned to small groups by instrument for their orchestra lessons, something that had to be taken into account when dividing groups. In an effort to keep groups even, instruments were also split between the groups; violin and viola in the control group and violin, cello and bass in the treatment group. All students involved were currently enrolled in the instrumental program and were first year students. In addition, they were all students of the instructor. Because the study used a control group and a treatment group, those students in the control group learned in a more traditional lecture format while those in the treatment group learned using the in-class flip method. With two different methods of instruction being used, there was the



potential that one method would prove more successful than the other. In this circumstance, if a method proved to be significantly more successful, to keep learning equitable and ethical, all would have had to be given the more successful method of instruction. All data that was collected was stored in a locked cabinet for confidentiality. Any playing examples were deleted at the end of the study.

### **Procedures**

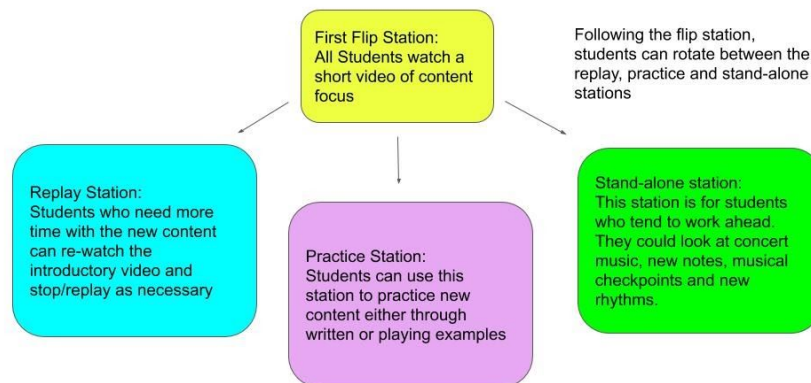
Following the collection of paperwork, students were split into one of two groups, the traditional instruction format and those students learning via the in-class flip. Once assent/consent forms were submitted, the forms were split into two groups, containing equal amounts of students from the gifted and regular classrooms. In an effort to keep groups even, instruments were also split between the groups; violin and viola in one, violin, cello and bass in the other. The first week of class all students were given a pre-test (found in the appendix) to determine what prior knowledge existed. The following week, some learned the new concept/techniques from the instructor, while others started their 30 minute class with a three to five minute video describing the new information. Students learned melodic content, rhythmic concepts or technique.

Students in the traditional group practiced this new information with a teacher, with feedback provided during their class. All topics in the traditional class were introduced by the teacher during class for these students. Those students that participated in the in-class flip learned from the short video first, then moved to one of three stations. Time allotted for each station was approximately 5-7 minutes. As the students rotated to each location the teacher

moved between stations as a moderator (see Figure 1). Students had the option of re-watching the lesson at one of the stations or practicing this new information at different stations either through written work or playing examples. Due to unforeseen circumstances, the study, which was to be at least 5-6 weeks in duration, lasted only two. Unfortunately, there was no opportunity to complete the multiple weeks of instruction. This meant data were collected for two weeks. Week two's flipped instruction data were used as the posttest. Data gathered included a pretest (written and playing exam) in week one and a posttest (playing exam) in week two (see Appendix A, B and C).

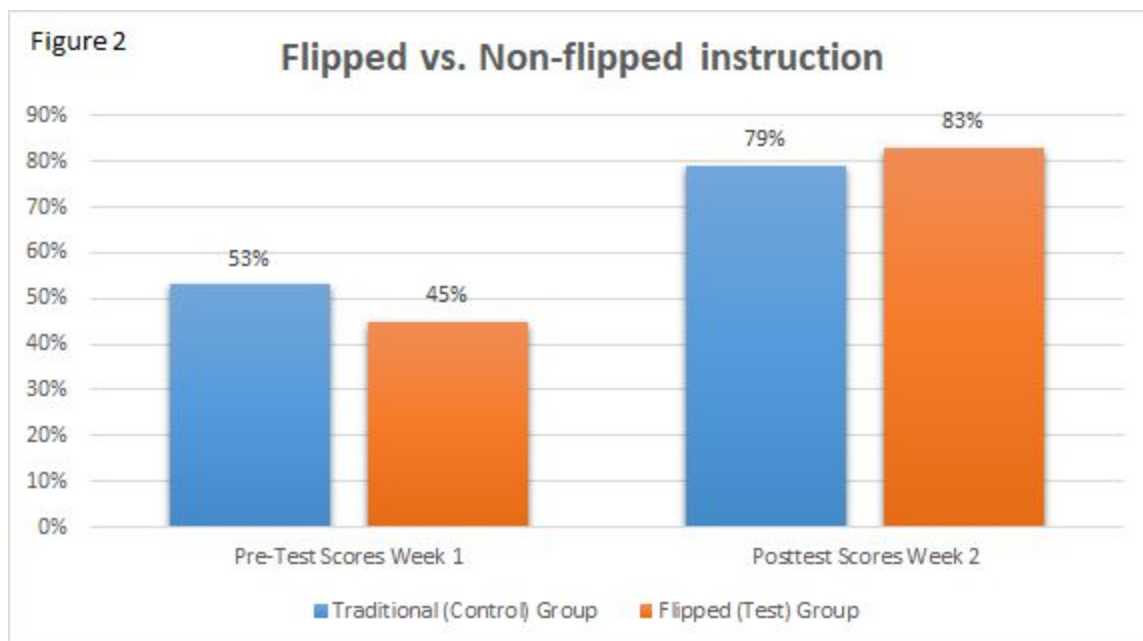
Figure 1

### The In-Class Flip in Orchestra



### Results

An independent t-test was performed on the posttest achievement scores to determine if a significant difference existed between the control group (traditional instruction) and treatment group (in-class flip). There was no significant difference between achievement scores for the control group ( $M = 12.64$ ,  $SD = 3.23$ ) and the treatment group ( $M = 13.33$ ,  $SD = .67$ ),  $t(27) = -.64$ ,  $p = .53$ . In this small study, students were given a pre-test one week followed by a post-test the following week. In the first week, students in the control group scored better with an average of 53% compared to the treatment group average of 45%. The following week in the posttest, students in the control group scored an average of 79% while the test group had a better average of 83% (see figure 2). Those in the control group scored an average of 53% on the pre-test, whereas those in the treatment group scored an average of 45%. On the posttest, students in the control group scored an average of 79% while the students in the treatment group scored an 83%.



### **Discussion and Conclusions**

Based on observations the instructor made, one of the biggest draws to trying an in-class flip was that every student in the classroom had access to what technology they needed, every student had the opportunity to learn the material together. For those interested in a flipped classroom environment, but frustrated by the follow through when attempting flipped instruction outside of the school day, the in-class flip allowed more oversight with students, ensuring all understood logins as well as the technology involved. From the one week of the in-class flip, the instructor noticed pacing did seem to move better through the in-class flip with station rotation. For instance, the instructor was able to play the instructional video while calling those students who forgot to come on time. Those who were on time could continue to the lesson and stations as the teacher started the video for those who came late. The teacher felt that generally there seemed to be less downtime. Based on teacher observation, some groups worked especially well in the in-class flip station rotation. While dynamics varied by student and group, the majority of students appeared to be engaged and interested in the process. Despite the fact that only half the classes were flipped while half were traditional instruction, the instructor's voice appeared to take less wear and tear by using a video for some of the instruction.

While there were some positives highlighted in the small window of action research, there were decided limitations. One of the greatest limitations in this study was the lack of adequate time to gather data and observe students due to a world-wide pandemic. Schools shutting down meant a severe lack of data. Because there was only one week of the in-class flipped classroom in process, there were few data from which to draw conclusions, or see any

trends. Due to the fact that there was no opportunity to administer the original posttest, data gathered were based on week 1 of the traditional instruction versus flipped instruction. This was already going to be a shorter term study, but school closures meant there was no opportunity to do further research or have a conclusion from which to draw data. A longer term study would have likely yielded more and potentially more meaningful results. A larger scale study would be helpful in determining how effective this method is as well as how/if results changed depending on classroom, school and/or region of the country. Because this study had a small group of participants, results cannot be generalized to different settings. Additionally, a mixed methods approach would be a way to gather additional meaningful data. While quantitative methods are important, it would be helpful to have students verbalize or write their responses to this method of instruction. Was it enjoyable? Did they feel it changed how they understood the material? Was it helpful to have a video they could replay? These are all questions that are hard for the instructor to answer without open ended questions and responses from students. Finally, due to how groups were structured, in some cases an entire instrument group was in the test group or in the control group. For example, all of the violas were in the control group, while all of the cellos/basses were in the test group. To gather more helpful data, it would be beneficial to split instruments into different groups and compare those data.

### **Future Research**

It would be interesting to see this study implemented using a longer timeline, with a mixed methods approach. This would also allow the instructor to incorporate materials that were never used but intended for use in the initial study. Adding a qualitative approach to the

quantitative data would give students and instructors the opportunity to provide feedback on their experience. A larger study would also help, as the significance values may have been influenced by the small number of participants in this study. The fact that the control group started out with a higher mean than the treatment group is an interesting anomaly here that deserves further study with more participants. Additionally, future studies might be repeated using student groups on one instrument. For example, it could be helpful to look at how the in-class flipped classroom worked with a control and treatment group of only violins or only cellos. Finally, a longer timeline would help in gathering more data, give students more familiarity with the material and technology and could help to determine potential trends.

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## Appendix A

### Instrument Pretests

### Bass Pretest

Name: \_\_\_\_\_

### Double Bass Pre-test



Notes: \_\_\_\_\_

Name: \_\_\_\_\_ Instrument: \_\_\_\_\_ School: \_\_\_\_\_

## Identify Those Notes

Write in your sentences below. Once you do, use your line and space sentences to help you figure out your notes!

Line Sentence: \_\_\_\_\_

Space Sentence: \_\_\_\_\_



Can you identify notes on the E/A String (please circle one)? Yes No

If yes, please write the letter name below each note as well as the fingering on the example below as well as the fingering above.



Cello/String Bass

Name: \_\_\_\_\_

# Vocabulary & Symbols Assessment 1

Instructions - Use the word bank to fill in the blank for the corresponding symbol in this musical example.

Do you know all  
of these  
vocabulary  
words and music  
symbols?

## Word Bank

Bass Clef  
Measure  
Bar Line  
Time Signature  
Quarter Note  
Quarter Rest  
Half Note  
Half Rest  
Double Bar Line

What is the definition of...

Pulse: \_\_\_\_\_

Pizzicato (pizz.) \_\_\_\_\_

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## Part 1

### Show What You Know!

Please play these examples and record them using Flipgrid. You need just one note (ex. open A string). Please say whether it is example 1, 2, 3 or 4 you are demonstrating when you record it.

1

2

3

4



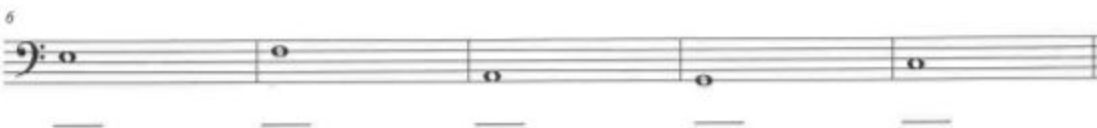
Name: \_\_\_\_\_ Instrument: \_\_\_\_\_ School: \_\_\_\_\_

## Identify Those Notes

Write in your sentences below. Once you do, use your line and space sentences to help you figure out your notes!

Line Sentence: \_\_\_\_\_

Space Sentence: \_\_\_\_\_



Can you identify notes on the G String (please circle one)? Yes No

If yes, please write the letter name below each note as well as the fingering on the example below as well as the fingering above.





Cello/String Bass

Name: \_\_\_\_\_

## Vocabulary & Symbols Assessment 1

Instructions - Use the word bank to fill in the blank for the corresponding symbol in this musical example.

The musical notation is in bass clef, 4/4 time. It consists of four measures. The first measure contains a quarter note, a quarter note, and a quarter rest. The second measure contains a quarter note, a quarter rest, and a quarter note. The third measure contains a half note and a half rest. The fourth measure contains a quarter note, a quarter rest, and a quarter note. There are arrows pointing from boxes to various parts of the notation: a box above the first measure points to the bass clef; a box above the first measure points to the first quarter note; a box above the second measure points to the first quarter rest; a box above the third measure points to the half note; a box above the fourth measure points to the first quarter note; a box below the first measure points to the first quarter note; a box below the second measure points to the first quarter rest; a box below the third measure points to the half note; a box below the fourth measure points to the first quarter note; a box below the fourth measure points to the first quarter rest; a box below the fourth measure points to the quarter note.

Do you know all of these vocabulary words and music symbols?

### Word Bank

Bass Clef  
Measure  
Bar Line  
Time Signature  
Quarter Note  
Quarter Rest  
Half Note  
Half Rest  
Double Bar Line

### What is the definition of...

Pulse: \_\_\_\_\_

Pizzicato (pizz.) \_\_\_\_\_

Part I

# Show What You Know!

Please play these examples and record them using Flipgrid. You need just one note (ex. open A string). Please say whether it is example 1, 2, 3 or 4 you are demonstrating when you record it.

1

2

3

4

*Viola Pretest*

Name: \_\_\_\_\_

### Viola Pre-test



Notes: \_\_\_\_\_

Name: \_\_\_\_\_ Instrument: \_\_\_\_\_ School: \_\_\_\_\_

## Identify Those Notes

Write in your sentences below. Once you do, use your line and space sentences to help you figure out your notes!

Line Sentence: \_\_\_\_\_

Space Sentence: \_\_\_\_\_



Can you identify notes on the G String (please circle one)? Yes No

If yes, please write the letter name below each note as well as the fingering on the example below as well as the fingering above.



Viola

Name: \_\_\_\_\_

## Vocabulary & Symbols Assessment 1

Instructions - Use the word bank to fill in the blank for the corresponding symbol in this musical example.

Diagram showing musical notation with eight empty boxes for labeling symbols. The notation includes a double bar line, a treble clef, a 3/4 time signature, and a sequence of notes and rests. The boxes are connected to the notation by arrows:

- Box 1 (top left) points to the double bar line.
- Box 2 (top left) points to the treble clef.
- Box 3 (top left) points to the 3/4 time signature.
- Box 4 (top left) points to the first quarter note.
- Box 5 (top middle) points to the first quarter rest.
- Box 6 (top middle) points to the second quarter note.
- Box 7 (top middle) points to the second quarter rest.
- Box 8 (top right) points to the final double bar line.
- Box 9 (bottom left) points to the first quarter note.
- Box 10 (bottom middle) points to the first quarter rest.

### Word Bank

Alto Clef  
Measure  
Bar Line  
Time Signature  
Quarter Note  
Quarter Rest  
Half Note  
Half Rest  
Double Bar Line

Do you know all  
of these  
vocabulary  
words and music  
symbols?



### What is the definition of...

Pulse: \_\_\_\_\_

Pizzicato (pizz.) \_\_\_\_\_

## Part 1

## Show What You Know!

Please play these examples and record them using Flipgrid. You need just one note (ex. open A string).  
Please say whether it is example 1, 2, 3 or 4 you are demonstrating when you record it.



*Violin Pretest*

Name: \_\_\_\_\_

## Violin Pre-test



Notes: \_\_\_\_\_

Name: \_\_\_\_\_ Instrument: \_\_\_\_\_ School: \_\_\_\_\_

## Identify Those Notes

Write in your sentence below. Once you do, use your line sentence and space word to help you figure out your notes!

Line Sentence: \_\_\_\_\_

Space Word + letter: \_\_\_\_\_



Can you identify notes on the G String (please circle one)? Yes No

If yes, please write the letter name below each note as well as the fingering on the example below as well as the fingering above.





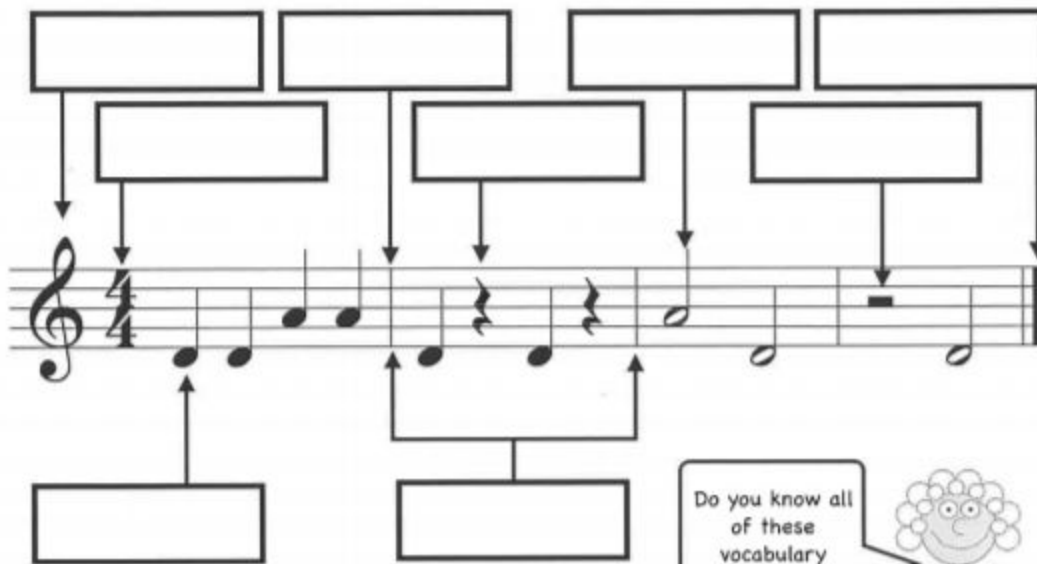
Violin

Name: \_\_\_\_\_

## Vocabulary & Symbols

### Assessment 1

Instructions - Use the word bank to fill in the blank for the corresponding symbol in this musical example.



#### Word Bank

Treble Clef  
Measure  
Bar Line  
Time Signature  
Quarter Note  
Quarter Rest  
Half Note  
Half Rest  
Double Bar Line

Do you know all  
of these  
vocabulary  
words and music  
symbols?



What is the definition of...

\_\_\_\_\_

Pizzicato (pizz.) \_\_\_\_\_

## Appendix B

### Playing Rubric

#### LESSON PERFORMANCE RUBRIC

	Notes	Rhythms	Steady Beat	SPECIAL SKILL Ex.) Slur, Hook, Tie, Low 2, etc.
<b>4</b> Exceeds Expectations	All of the notes are played correctly.	All of the rhythms are played correctly.	The assignment is played confidently and at an appropriate speed indicating that the student prepared the assignment. The notes and rhythms flow and the playing is fluent and musical.  The music is played with a very steady beat.	100% accuracy and no hesitation. Very confident.
<b>3</b> Meets Expectations	Less than 3 notes are played incorrectly or skipped.	Student alters a few rhythms to accommodate notes.  Student does not hold a note for its full value.	The assignment is played confidently and at an appropriate speed despite a few mistakes indicating that the student prepared the assignment. The notes and rhythms flow.  The music is played with a steady beat.	Student hesitates one time during the part with the special skill but still performs the skill 100% accurately.
<b>2</b> Approaching expectations  RETAKE RECOMMENDED AT NEXT LESSON	4-6 notes are played incorrectly or skipped.	Student alters several rhythms or completely misses rhythms.  Eighth note pairs are not played twice as quickly as quarters.	The assignment is played with a lot of hesitation indicating that the student did not practice as much as he/she should have to be prepared for the lesson or that this lesson was a lot trickier for the student.  The music is not played with a steady pulse.	Student might perform the skill accurately, but hesitates too much while doing so and seems to need more practice with the special skill.
<b>1</b> Needs Improvement  RETAKE RECOMMENDED AT NEXT LESSON	Student misses almost all of the notes.	Student misses almost all of the rhythms.	The assignment is played with so much hesitation indicating that the student has spent no time preparing for the lesson.  The music has no steady pulse.	0% accuracy on new skill

## Appendix C

### Playing examples

#### *Cello/Bass Posttest*

**THEORY**

**Half Note**  
= 2 Beats  
1 & 2 &

**Half Rest**  
= 2 Silent Beats  
1 & 2 &

**77. RHYTHM RAP**  
Shadow bow and count before playing.

Count: 1 & 2 & 3 & 4 & 1 & 2 & 3 & 4 & 1 & 2 & 3 & 4 & 1 & 2 & 3 & 4 &

**78. AT PIERROT'S DOOR**  
Moderato  
French Folk Song

Slow Bow → Slow Bow → Slow Bow →

### Viola Pretest

**THEORY**

**HAIR NOTE**

1 & 2 &

**HAIR REST**

1 & 2 &

*Violin Pretest*

**77. RHYTHM RAP**  
*Shadow bow and count before playing.*

Count: 1 & 2 & 3 & 4 & | 1 & 2 & 3 & 4 & | 1 & 2 & 3 & 4 & | 1 & 2 & 3 & 4 &

**78. AT PIERROT'S DOOR**  
*Moderato*

French Folk Song

Slow Bow → Slow Bow → Slow Bow →

## Appendix D

### Waiver, Consent and Assent Forms

#### *Video Permission Form*

##### Video Permission Form

Dear Orchestra Families,

As part of the research project students will be asked to record playing videos. The site/app we use to do this is Flipgrid. I have made settings so that only I can see what video is posted. Also, only those who have the grid name and password can get into our Flipgrid group. This is helpful to me when students are working on their own and demonstrating new rhythms or hand/bow positions.

I am asking for permission to use this site to record your child's videos. I would delete these videos after the project is complete.

Thank you,

Jeanmarie Braddock

Please circle one and fill out the form below:

My child DOES have permission to record playing videos using Flipgrid during class time.

My child DOES NOT have permission to record playing videos using Flipgrid during class time.

\_\_\_\_\_  
Student Name

\_\_\_\_\_  
Parent/Guardian Name (Please print)

\_\_\_\_\_  
Parent Name Signature

\_\_\_\_\_  
Date



*Parent Consent Form***Exploring the In-Class Flip in the Elementary Orchestra Setting**

Dear Orchestra families,

You and your child are being asked for permission to participate in a graduate study research project from March through early April. Students will be taught two different ways. The first is the same way they have been learning. The second way they would be learning using short video clips and then rotate through stations in the classroom.

This would take place during regular class time using the books and music appropriate for elementary orchestra. Students who participate will be asked to answer questions before starting and then finishing this study. The research would compare learning using the way students are used to and comparing it to students who are learning with a "flipped" approach. When using flipped learning, students would watch a short video about their instruments that would be 3- 5 minutes long. Students would answer questions with an assignment, exit ticket, playing an example for the teacher or by recording playing examples, with the teacher monitoring. All information gathered will be kept private and stored in a locked cabinet. No names or identifying information would be used in this study.

The "in-class flip" station rotation, in this study means some students would learn new information through a video during class time. They would then practice that with the teacher who would rotate through groups. For the groups taking part in the "in-class" flip, it will be at one of several stations. The classes participating would rotate through the stations, allowing all students to learn and practice this new information. For those taking part in the flipped learning, students would watch short 3-5 minute videos introducing new notes, rhythms and techniques. Videos would be made by the teacher. Before starting this method of learning, students would take a pre-test to see what information they already know. At the end of the study the teacher would look at the two ways of learning and see if there were any big differences. As they worked with new notes and rhythms, students would use exit tickets, as well as the app "Flipgrid" to record any video clips of playing examples to collect regular data. Flipgrid privacy would be set so that videos are only able to be viewed by the teacher. Videos sent to the teacher on Flipgrid would be deleted by the end of the school year.

Some students will be taught using the same way they are familiar with and some will use the flipped instruction more. Because a flipped method could free up teaching time, a potential benefit could be that students could move at their own speed and re-watch concepts when needed. If the information gathered shows this to be much more successful for students, this method of teaching could be adapted for all of the students participating.

---

Subject's Initials

If a child chooses not to be a part of this study, he or she would still be learning with the class. If a student doesn't take part, his or her information would not be used in the study. This would not change any grades. Students have the choice of stopping part way through the study if they need to. A child would only be removed from the study if he or she missed too many classes and there wasn't enough information to compare. Whether the student does or doesn't participate in this study will not change the student's relationship with the teacher, the school or any relationships with USciences.

If you have questions, you can get more information from:

Jeanmarie Braddock  
Orchestra Teacher  
[jeanmarie.braddock@bsd.k12.de.us](mailto:jeanmarie.braddock@bsd.k12.de.us) (best)  
302-792-3880

Sarah Eckert  
UArts Research Advisor  
[seckert@uarts.edu](mailto:seckert@uarts.edu)  
(215) 717-6432.

If you want to know more about your rights, you may contact someone at [irb@usciences.edu](mailto:irb@usciences.edu) or 215-596-7490.

### Consent

I have been informed of the reasons for this study. I have had the study explained to me. I have had a chance to ask questions and have had them answered. I have read this consent form, have initialed each page, and have received a signed copy. I agree to participate in this study voluntarily.

\_\_\_\_\_  
Subject Name

\_\_\_\_\_  
Subject Signature

\_\_\_\_\_  
Date

### Investigator's Affidavit

I have carefully explained the information in this project. I certify that to the best of my knowledge the person who is signing this consent form understands clearly the nature, demands, benefits, and risks involved in his/her participation and his/her signature is legally valid. A medical problem or language or educational barrier has not precluded this understanding.

\_\_\_\_\_  
Signature of Investigator

\_\_\_\_\_  
Date



*Student Assent Form***Exploring the In-Class Flip in the Elementary Orchestra Setting**

Dear Orchestra Student,

Your teacher is asking you to be a part of a project. This would be during our small group time. Some students would learn the way you have already been learning. Some students would learn with short videos and stations. All students who do this would be asked to do small tests/quizzes, record themselves playing some music and turn in exit tickets. The information that would be collected and not shared. It would be stored in a locked cabinet. Your name would not be used in this study.

The small videos and stations have a special name. It is called an "in-class flip". Your teacher wants to see how students learn differently. You already learn one way. She wants to see how the old way and new way are different. There will be two groups of students. One group will learn the way you are used to learning. The other will learn the new way. The new way would use a short video and stations. Your teacher will give you a quiz the first day. When this is finished, your teacher would ask you to take another quiz. Your papers, videos and quizzes will be kept private. Your teacher is the only one who would see them. She would erase any videos at the end of the school year.

Some lesson groups would learn the same way we have been learning. Some groups would use the "in-class flip". Your teacher hopes to learn from the information she collects. She would like to see what seems to be the most helpful. If it seems like one way is much better than the other, all students would in time learn using that way. This project would take place during the month of March into early April.

If you choose not to be a part of this study, you would still be learning with the class. Your teacher would just not use your quizzes, papers or videos in her study. This would not change your grade. It won't change your relationship with your teacher, school or USciences. You can choose to stop taking part in the study if you need to. Your teacher would only ask you to stop if you missed too many classes and she didn't have enough information to compare.

If you have questions, you can get more information from: the study investigator

Jeanmarie Braddock  
Orchestra Teacher  
[jeanmarie.braddock@bsd.k12.de.us](mailto:jeanmarie.braddock@bsd.k12.de.us) (best)  
302-792-3880,

Sarah Eckert  
UArts Research Advisor  
[seckert@uarts.edu](mailto:seckert@uarts.edu)  
(215) 717-6432. If you have questions

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Subject's Initials

If you want to know more about your rights, you may talk to someone at [irb@uscience.edu](mailto:irb@uscience.edu) or 215-596-7490.

**Assent for Participation**

I have been told about the reasons for this study. I have had the study explained to me. I have had a chance to ask questions. I have had questions answered. I have read this form. I have signed my initials on each page. I have received a signed copy. I agree to take part in this study.

---

Subject Name

---

Subject Signature

---

Date**Investigator's Affidavit**

I have carefully explained to the student about the project listed above. I believe that the student signing this form understands the project. He or she knows it will take time and work. The student understands they might learn the same way or they might learn a different way. Students might like this study. Students might also not like the way of learning. The signature is legally valid. This student does not have a problem understanding this letter. The student does not have any learning, mental, or physical trouble that keeps him or her from understanding this project.

---

Signature of Investigator

---

Date

---

Subject's Initials

## Appendix E

### Week 1 and Week 2 Data

#### *Control Group*

Control Group Names:	Pretest score	Pretest possible points	% Pre-test	Week 1 posttest score
Student 1C viola	37	80	46%	12
Student 2C violin	34.5	80	43%	10
Student 3C viola	38	80	48%	16
Student 4C violin	22	80	28%	10
Student 5C violin	73	80	91%	15
Student 6C violin	33	80	41%	16
Student 7C viola	20	80	25%	13
Student 8C viola	70	80	88%	15
Student 9C violin	46.5	80	58%	15
Student 10C viola	54	80	68%	11
Student 11C violin	71	80	89%	12
Student 12C violin	25	80	31%	14
Student 13C viola	28	80	35%	4
Student 14C violin	47	80	59%	14
Mean (Average)	42.46		53%	12.64
Variance	331.8351648			10.4010989
n	14			14

*Treatment Group*

Treatment Group Names:	Pretest points	Pretest possible points	Percentage	Week 1 posttest score
Student 1T violin	30	80	38%	15
Student 2T violin	74	80	93%	14
Student 3T cello	25	80	31%	14
Student 4T violin	23	80	29%	10
Student 5T violin	48	80	60%	13
Student 6T cello	78	80	98%	15
Student 7T cello	10	80	13%	16
Student 8T cello	40	80	50%	14
Student 9T violin	9	80	11%	7
Student 10T violin	34	80	43%	11
Student 11 T violin	41	80	51%	13
Student 12T violin	25	80	31%	11
Student 13T bass	41	80	51%	15
Student 14T violin	27	80	34%	16
Student 15T cello	39	80	49%	16
	36.27		45%	13.33
	383.0666667			6.666666667
	15			15

## Curriculum Vitae Jeanmarie Braddock

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### Education

University of the Arts, Philadelphia, PA	2017-2020
West Chester University, West Chester, PA	1996-2000
Suzuki Violin Training, Ithaca, NY	2002

### Professional Experience

Brandywine School District	2011-present
<ul style="list-style-type: none"> <li>• Elementary Orchestra teacher 2014-present</li> <li>• Elementary General Music Teacher 2011-2014</li> </ul>	
Independence School	2000-2011
<ul style="list-style-type: none"> <li>• Orchestra teacher for grades 3-8, and a choral and general music teacher for grades 4-8.</li> </ul>	
Cab Calloway Summer Camp	2011-2013

### Private Instruction

Private teacher for violin lessons	2000-present
Vocal Coach, Wilmington, Delaware	2000-present
Music School of Delaware	2001-2004
Pro Musica Studios, Kennett Square	1998-2001

### Performance History

Violinist and Vocalist of The Nearly Valentines duo	2002-present
Violinist in Pegasus trio	2011-present
Solo and ensemble work with violin and voice	2000-present
Hired soprano at Church of the Loving Shepherd, West Chester, PA	2009-2011
<ul style="list-style-type: none"> <li>• Director of children's church choir 2010-2012</li> </ul>	
Soprano in Wilmington choral group CoroAllegro	2003-2010
Participant in voice and violin master classes in Brasov, Romania	2001
Recorded for local children's CD, "Tiny Turtles"	
2002-2004	

