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SCHOOL OF GRADUATE STUDIES

THE MIE MIDI KEYBOARD VS THE FLUTOPHONE: A COMPARISON OF TEACHING BASIC MUSIC CONCEPTS TO THIRD GRADE STUDENTS TO SEE HOW IT IMPACTS THEIR PREPARATION FOR AND OPINION OF BEGINNING BAND

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By

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Masters of Music in Music Technology

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ABSTRACT

The purpose of this study was to determine if there would be a difference in third graders' musical knowledge after six weeks of instruction on two different instruments. Two classes of third graders were instructed on the flutophone to learn basic notes, rhythms and other musical symbols. The other two classes were taught on Music In Education (MIE) keyboards. A secondary purpose was to determine if the instructional delivery impacted students' opinion toward participation in band, and if so which instrument they were interested in learning. Each student was given a pre-test at the beginning and the same test as a post-test at the end of the six-weeks instructional period. Results showed that the flutophone and keyboard instruction produced similar musical knowledge and interest in joining the band. Student preferences for specific instruments were not impacted by the instructional delivery. Students in all groups expressed a greater preference for flute and percussion. Both MIE keyboard students and flutophone students were more interested in joining band than choir. Also, students that received piano instruction outside of school scored higher in the general musical knowledge section than their classmates. This leads to the conclusion that teachers can obtain similar results using the flutophone or the MIE keyboard, depending on which is available in their classroom.

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Chapter 1

INTRODUCTION

Statement of the Problem

For years third grade classes have used flutophones or recorders to learn basic notes and instrumental techniques before they start band the following year. With the proliferation and ease of MIDI keyboards in the classroom, educators may wonder if the flutophone still aids students in preparing for band, or if instruction on a keyboard instrument would accomplish the same results. There are pros and cons of each type of instruction. Flutophones are inexpensive and each student can purchase their own instrument. This enables all students to practice at home and develop the diligence that is needed for success on a band instrument. A problem with flutophones, however, is they are rarely seen again after the elementary music class. Many of these students transfer their skill to a band instrument, but others are left with skills on an instrument they will never use as a youth or adult.

The keyboard or piano may be a reasonable alternative to the flutophone because skills on that instrument tend to be life-long. The keyboard provides the opportunity for students with different learning styles to see, hear and touch the keys to make music. This form of instruction is becoming increasingly valued in the general music curriculum because the skills acquired can be transferred to any other instrument or genre of choice later in life. Children and adults alike use the piano for many styles of music. There is research which suggests that playing piano as a child enables development in other content areas (Costa-Giomi, 1999). One disadvantage of teaching keyboard in school is that not every student has an instrument at home on which to

practice. Since the students do not own an instrument, they may not have the same opportunity to learn or practice it.

Define the Problem/Study

This study worked with third grade students to test their musical knowledge and interest in being part of the instrumental music program at the school. Students were divided into two groups and half of the students were instructed using the flutophone and the other with a MIDI keyboard (Music In Education-MIE). Both groups utilized method books and had some form of extrinsic motivation. The recorder students earned 'belts' as part of the Recorder Karate curriculum and piano students earned colors on a rainbow after completing songs in the Bastien piano book. An Alfred book was used for supplemental study also. Students were assessed after six weeks of instruction for musical knowledge and opinions about participating in band. To insure that each student is given the same opportunities at the school, students will rotate instruments after the study is complete. The results after the rotation will not be analyzed.

Since the researcher has four classes of third grade, two were assigned to flutophone and the other two assigned to MIE keyboard instruction. The male/female ratio between all of the classes wass similar. The classes met twice a week for 30 minutes each.

After six weeks of instruction, the students were asked to take a test measuring their general musical knowledge. Students were also given a test in which they could state their opinion about joining beginning band and which instrument they would be interested in playing.

The results were analyzed using the mean, median, mode and t-test to compare the types of instruction.

Limitations of the Study

One of the limitations of this study was that it took place in just one school district. This test ideally would be reproduced in many different schools that varied socially, economically and academically to insure that results were not related to those variables. Also, since not all school districts have access to a MIDI keyboard lab, some would not have the technology for keyboard instruction. Another limitation is that because the teacher was both the researcher and the tester for the flutophone and MIE keyboard groups, all of the data was handled by one individual. A difference of instructors might have affected the final results.

The researcher taught in the middle school music classroom in another school district for two years prior to this study. This was the researcher's first year teaching elementary and instructing both flutophone and keyboard in the classroom. Additionally, piano is the instrument in which the researcher is trained. The researcher's personal opinion has remained neutral in the classroom though. Also, the researcher did not teach these students in the years before this study, so it took some time to determine the students' musical knowledge. Finally, instructional practices change over time and with increased experience, and these variables will not be addressed in this experiment.

The researcher designed this experiment after only a tour of the classrooms in which instruction would take place because of a job transfer. Consequently, the study was designed

around the MIE keyboards since they appeared to be the only evidence of technology in the elementary music room at the time.

Null Hypothesis

There is no significant difference in the the knowledge of music fundamentals, as measured on a teacher-created test, between the students trained on flutophone or MIE keyboard. There is no significant difference in the attitudes of students toward participating in musical ensembles such as band, orchestra or choir, as measured on a self-reporting attitude scale between students given six weeks of flutophone instruction, and those given six weeks of keyboard instruction. After six weeks of instruction there will be no significant difference in the opinion of flutophone and MIE keyboard students about playing a woodwind instrument.

Need for the Study

This study is necessary because flutophone instruction has been around for longer than keyboards have existed. It is important for music educators to re-evaluate content in the classroom after significant changes have been made. In this circumstance, technological developments may have caused a shift towards the phasing out of the flutophone in the music classroom. If instruction is still received as well by the students on the flutophone as newer forms of technology, then that instrument's use becomes a well-tested instructional practice that

should continue through this new phase of technology in music education. If newer technologies hold greater promise though, then it may be time to shift emphasis to their use.

Chapter 2

REVIEW OF RELATED LITERATURE

In the review of literature there were five types of articles identified: those dealing with keyboards, flutophones/recorders, assessment, beginning instrumental recruitment and other. Since there is little research on the concept of comparing the keyboard directly to the flutophone/recorder in music educational instruction, these sources provide an overview of the aspects which have been studied.

Keyboard

There were eleven articles found on the topic of the keyboard or piano in education. The keyboard had the most research on instruction benefits for students and adults later in life. According to the studies below, many students in American culture take piano lessons as children. Furthermore, much of the public agrees that the skills learned are lifelong, whether or not the children pursue music as a career path.

Class Piano for Elementary Classroom Teachers

Hjelmervik explains how the city of Baltimore took action to offer class piano lessons for teachers.

> What musical skills should an elementary classroom teacher possess? Some skill at the piano keyboard seems to rank high, at least in the opinion of a considerable number of elementary teachers in the public schools of Baltimore, Maryland (Hjelmervik, 1950. p. 30).

Teachers found this instruction helpful and "more valuable than any other instruction perviously received in music" (Hjelmervik, 1950, p. 30). This article shows the lifelong value of piano as part of music education.

Piano Teaching Down to Earth

Burrows writes his article about a typical piano class comprised of average third and fourth grade students that have not had prior piano instruction. The class meets for two 45 minute periods each week. Though there are many goals with a class of this nature, the most significant is that students develop a "pleasurable attitude toward piano playing. Unless the pupil enjoys playing the piano for himself and others by the end of the first year, we may consider that the piano class has failed, no matter what other gains are realized" (Burrows, 1939, p. 20). Creating an atmosphere where students can love learning music, and in this case the piano, is of utmost importance. This article then lists other goals that will be accomplished in the elementary piano class. The implication of Burrows' study for this research project is that students' opinion and passion for music are valuable.

Keyboard Experience in the Classroom

The piano can be a wonderful tool to aid instruction in the general music classroom. "In this way sight, touch, and hearing are combined to gain insight into reading music" (Pace, 1960, p. 44). There is emphasis in today's school system on reaching many different types of learners. The piano allows aural, visual and kinesthetic learners to be taught in the same lesson. Specific music concepts can also be taught more easily using the piano, such as harmony and key signatures. Students are able to literally see and play the notes rather than just look at them on paper. The article stated that a consultant after her first year of keyboard instruction said "her second-graders knew more music and were more proficient and excited about it than her sixth graders who had been taught perviously in the traditional way" (Pace, 1960, p. 45). The power of the keyboard as an instructional tool for various types of learners makes it an appropriate instrument to teach music to elementary students.

Keyboard Experience in Elementary Music

Robert Surplus talks about the many opportunities the piano can offer students in the general music classroom. It can be used as a performing instrument, but also as an aid for students to understand many aspects of music. "Keyboard experiences should be integrated in the total general music program so that children can more easily acquire an understanding of musical concepts and a greater capacity for musical enjoyment" (Surplus, 1963, p. 87). One of the reasons why the piano is such a powerful tool is students have the ability to 'see' musical

concepts, such as scales. Since keyboard knowledge is a transferable skill to other studies in music it is an appropriate instrument to be taught in the general music classroom.

Elementary Music with Synthesizers

"A synthesizer is a tool for learning about music and not a music curriculum in and of itself" (Wiggins, 1993, p. 25). Synthesizers can be a part of the typical elementary classroom. Xylophones (or Orff instruments) are often used to give students instrumental experience. Keyboards can be used right alongside them for instruction. One major difference to be careful of between keyboards and xylophones is the difference between the fine motor and gross motor skills required to play the instruments. "Synthesizers can also be used quite effectively in combination with recorders" (Wiggins, 1993, p. 27). Since synthesizers can create all types of sounds, they can be made to blend with the typical recorder that is used for beginning band instruction. Using keyboards in the classroom also builds credibility for the teacher with the students, parents and administration that they know about 'real' music. Gaining the support of administration and the community is key for the success of a music program in a school. If teaching keyboard can help establish that respect, it is worthy of examination by music educators.

Keyboard Instruction in the Music Classroom

"Music educators are at the exciting point of being able to incorporate advances in technology and the popularity of keyboards into the music curriculum" (Appell, 1993, p. 21). Keyboards are able to be used to support literacy and creativity. They naturally are able to reach

various types of learners through visual, aural and tactile techniques. Grades 3-6 are found to benefit the most from keyboard instruction in the elementary school since they have more developed listening skills. When assessing students on the keyboard it "should include formal evaluation of student skills, as well as an informal evaluation such as feedback from students, staff and parents" (Appell, 1993, p. 24). This study has statistics that support third grade as an appropriate time to have keyboard instruction.

Effects of Self-Assessment and Successive Approximations on "Knowing" and "Valuing" Selected Keyboard Skills

In this study, piano students were asked to answer a survey about five piano skills (hand position, sight-reading ability, correct fingering, musicality and good technique) and to rank how much they 'knew' and valued' each skill. The student's self-assessment scores were lower than the teacher scores throughout the five categories. Students said sight-reading was the most difficult skill for them to master. This article shows multiple ways that the piano could be tested as well as determining who should be in charge of results: students or teachers.

The Effects of Three Years of Piano Instruction on Children's Cognitive Development

"Experienced musicians and musically talented individuals differ from non-musicians in the development of specific cognitive abilities and in certain aspects of the brain structure and functioning" (Costa-Giomi, 1999, p. 198). The development of spatial abilities is particularly noted. Research has found that "children participating in music instruction outperformed

children not receiving formal music instruction in one of the five scales of the Performance Weschsler Preschool and Primary Scale of Intelligence" (Costa-Giomi, 1999, p. 199). Eugenia Costa-Giomi used this information to create a study that offered three years of free piano study and an acoustic piano to low income students. (This is opposite of the typical piano student which is from an upper income, highly educated family.) The goal of the study was to "examine whether music instruction affects the cognitive abilities of children from less-privileged backgrounds" (Costa-Giomi, 1999, p. 201). The results of this study were surprising. After two years of study, cognitive and spatial abilities were improved in the students. After the third year however, there was no difference between the students taking lessons and the control group. The reason for this may be that at the beginning, the children were excited about lessons, progressed quickly and easily, and skills increased. Later, learning the piano required more intentional effort and only students that were dedicated continued progressing. So it was found that,

> individual piano instruction did not affect the development of children's quantitative and verbal cognitive abilities, providing further evidence that the contribution of music instruction to cognitive development might be more limited than has been previously suggested (Costa-Giomi, 1999, p. 207).

As a conclusion to this study, musical instruction temporarily improves cognitive and spacial abilities for children, but it may not last long term.

"I Do Not Want to Study Piano!" Early Predictors of Student Dropout Behavior

This study was connected with Eugenia Costa-Giomi's article summary above.

> Prior to the treatment, children completed a series of tests: the Developing Cognitive Abilities Test, the tonal and rhythmic audiation subtests of the Musical Aptitude Profile, the fine motor subtests of the Bruininks-Oseretsky Test of Motor Proficiency, the language and mathematics subtests of the Canadian Achievement Test and the Coopersmith Self-Esteem Inventories (Costa-Giomi, 2004, p. 58).

According to "ANOVAs of the cognitive abilities, self-esteem, and fine motor skills, scores did not indicate any significant difference between the children who completed three years of piano instruction and those who dropped out" (Costa-Giomi, 2004, p. 59). This part of the study looked at reasons why students dropped out of the piano instruction program. The students that dropped out of the program before the three years was over had a lower achievement in the first six weeks of instruction. Also, "most of the children who had no siblings dropped out of lessons while most of the children with two or more brothers and sisters completed three years of instruction" (Costa-Giomi, 2004, p. 59). More boys than girls dropped out, which correlates with previous findings that more girls than boys take piano lessons. Also children that had two working parents were more likely to drop out of lessons. This correlates with a previous finding that 37% of piano students have a mother who stays at home. "These findings suggest that the clearest indications that a student in likely to drop out of piano lessons are lowered motivation and diminished achievement" (Costa-Giomi, 2004, p. 62). Costa-Giomi's study was based on private piano instruction while the this experiment will take place in a classroom setting. It would be interesting to note if this has any affect on the cognitive development for students.

Children Who Study Piano with Excellent Teachers in the United States

"The population of children who study piano privately has been the topic of few research investigations, and relatively little is known about the students who participate in piano lessons in this country" (Duke, Flowers, Wolfe, 1997, p. 51). This quote shows a great need for research and study of piano in music education. This project asked approximately 100 college professors to recommend quality piano teachers in their area. From these teachers a random selection of

663 students were chosen and studied. Once this random selection was made, it was found that most families of piano students had two or three children and lived in a suburban setting.

Among this population it was found that "approximately 85% of the mothers and 72% of the fathers who studied the piano as children continue to play as adults" (Duke, Flowers, Wolfe, 1997, p. 56). This shows the importance of the piano as a lifelong instrument that can be taught to children.

> 91% of the students expect to attend college, and 93% of the parents expect their children to attend, but it is notable that only 6% of parents expect their children to become arts professionals. This seems important because it provides an indication that very few of the parents in this sample view piano study as preparation for a career in music (Duke, Flowers, Wolfe, 1997, p. 61).

They obviously still recognize it as a valuable skill though to pay for lessons. When asked about if the students would continue to play after lessons ended, "74% of teachers, 76% of parents and 66% of students indicated that students would continue to play the piano as adults" (Duke, Flowers, Wolfe, 1997, p. 65). These are high percentages to show how the piano will be a lifelong skill for students.

Certain behaviors were also recognized as positive results of piano lessons. They include, but are not limited to, discipline, concentration, self-esteem, personal pleasure, better reading skills and less time watching television. Also, when these children were polled about their opinion of music compared to other subject areas (English, math, physical education, science and social studies) music was the subject that most children said they loved (54%). If students develop a love for music, there is obviously a much better chance that they would want to join band.

Success with Keyboards in Middle School

"If music is to stay a viable part of the school curriculum and meet the needs of students, it must combine technology with traditional skills just as other subject areas are doing" (Chamberlin, Clark, Svengalis, 1993, p. 31). This article explains how keyboard education helps meet these goals in middle schools in Des Moines, Iowa. Two classrooms were developed and studied. The first used the Yamaha Music in Education (MIE) program (which had fifteen keyboards with two students at each). It also had a Macintosh computer, portable speakers and a projector with a screen. The other class collected old keyboards and pianos from neighboring schools and built a program slowly, eventually including a Macintosh computer and additional software. Both types of classrooms helped create enthusiasm for music in their schools. This project shows how the electronic keyboard can aid in teaching music in the modern classroom.

Flutophone/Recorder

There were three studies found on the recorder. Most schools teach the recorder the year before beginning band, yet there was a lack or research on the topic. It is a problem if music educators do not have significant reasons for why they use the instructional practices they do. It is obvious though that third grade is the most logical time to use flutophones/recorders if students start band in fourth grade.

Come, Some Music! Come, the Recorder

The recorder reached popularity in the middle ages. Shakespeare mentions the recorder in Hamlet. The recorder has been found to "be the most satisfactory approach to good music reading for children in general music classes in the intermediate grades of the public school" (Davis, 1961, p. 82). Many types of 'flute-like' instruments have been used in classroom music for years, but the recorder has a wider range, better tone quality, and is a real musical instrument. There are six different types of recorders. "The soprano or descant recorder is the instrument upon which instruction should begin in the elementary schools. Plastic and wooden ones may be purchased from three dollars up" (Davis, 1961, p. 83). This article provides proof of the validity of using the recorder in the music classroom.

Recorder Resources, Part 1

There are specific goals in teaching the recorder. Some of them include transferring "musical skills learned on voice and percussion to a wind instrument, experience learning and performing as an instrumentalist and learn readiness skills for starting a band or string instrument" (Marshall, VanHaaren, 2006, p. 1). Typically schools buy recorders in bulk and students each pay a small fee for one. Recorder study is typically done at the end of third grade and is often scheduled as a four to six weeks unit. Many different instruments have been used for study, including the flutophone, but "the instrument that allows for the greatest potential and musicality is the recorder" (Marshall, VanHaaren, 2006, p. 3). Most American teachers use the English Baroque recorder for study. For upper elementary students, using a two or three section

instrument is recommended so it can be tuned as well as having the ability to play chromatic alterations (two extra holes under pinky fingers of right hand). The Aulos brand even makes a recorder where each hole can be adjusted or closed to adapt to special learners. In the end, the teacher has to make the decision if the purpose of the recorder study is cognitive general music knowledge or preparation for instrumental performing skills. This determination will affect the type of method book used for study. It also offers expertise on various types of recorders and confirms that six weeks is an appropriate time to do the study of flutophones for this experiment.

Recorder Resources Part 2

One of the major considerations for the recorder teacher is whether to teach by rote or note to their students. If done in the rote style, the teacher should try to limit verbal instruction and make patterns begin and end on the same pitch. Many methods books like "Share the Music" have recorder materials within the book. If teaching with note, be careful to only teach one new thing at a time. Singing first often improves the playing. Notes B, A and G are the three most important notes to teach first, and then descending pitches. Since this experiment will use the note technique, this article gives good suggestions of which notes to teach first to the recorder students.

Assessment

Knowing how to assess students musically can often be a challenge. Performance based assessment is necessary for some types of instruction, while others require more of a

standardized pencil/paper test. Opinion tests can also be used at times to allow students to share their thoughts. Assessment can be done at the beginning (formative) or at the end (summative) and the instructor has to make the decision of which is best in each circumstance.

Six Key Principles for Music Assessment

Assessment is an important consideration in the educational process. "Targeting the end result provides a clear image of what you ultimately want to achieve in your instruction" (Hale, Green, 2009, p. 2). This can be done by making sure each student knows the learning target for the class. Diagnostic assessment is done first. For example, having an ensemble sight-read a piece of music. As students begin learning, formative assessments are made to see how they are coming and then eventually a summative assessment is done at the end to see what the students learned. Summative assessments are used for many thesis to see if the hypothesis was correct or not. Self-assessments, sometimes done through rubrics, are also helpful for the student to take responsibility for hi/her own learning. A summative assessment will be used at the conclusion of this experiment to see what the keyboard and recorder students learned.

Debating Assessment in Music Education

Ryan Fisher debates throughout this article whether music is considered part of the core curriculum, and if so, why it is not nationally tested. Many music teachers argue that music cannot undergo standardized testing because it is such an art. Others realize that to gain the

respect of legislators, music will probably have to undergo national testing someday. Most administrators and school board members see a successful music program as one that has great concerts, pep bands and few complaints from parents. A positive result of having a national assessment is that it would hold the individual student responsible rather than just the full ensemble. In this experiment, each individual student will be held responsible for his own learning since he will take a written test at the end of the six weeks instructional time.

Beyond the Grade

Assessment can be one of the most difficult parts of being a teacher, particularly in the music classroom where a teacher sees hundreds of students. Small informal assessments can be done on a regular basis though to help students know how they are progressing. Technology can aid in the assessment process. For example, "students can record themselves singing or playing recorder" (Randall, 2010, p. 3) for the teacher to listen to later. Recording will not be a part of this experiment, but it would be a great way to adapt and reuse this study later in a different school.

A Longitudinal Comparison of Four Music Achievement and Music Aptitude Tests

This study evaluates different types of music achievement and aptitude tests. The Music Aptitude Profile (MAP) and Measures of Musical Abilities (MMA) are musical aptitude tests, while Music Achievement Test (MAT) and Iowa Tests of Music Literacy (ITML) measure results of teaching. It is an important issue to think through which type of testing would be best utilized in this study. If standardized tests were used to measure what students learn after a six weeks period, the MAT or ITML would be the best choices. For this study the researcher has decided to create a new test with the demonstration of learning for flutophone and keyboard in mind.

One other interesting fact in this study is that the teacher asked students to list their years of piano experience on the evaluation. The years of piano study had a low correlation with teachers' ratings or musical achievement, "indicating that this is probably not a factor in successful performance on a band instrument" (Young, 1976, p. 107). This information could add an interesting component into this study if piano skills do not translate well into band instrumental skills.

A Factor Analysis of Musical Aptitude Profile, the Primary Measures of Music Audiation, and the Intermediate Measures of Music Audiation

The Music Aptitude Profile (MAP) is a well-known music test, but it has been found that it is not reliable for students younger than nine years old. Due to this, the Primary Measures of Music Audiation (K-3rd) was developed in 1979 and the Intermediate Measures of Music Audiation (1st-4th) in 1982. They are electronic tests made up of seven subtests. The main difference between the two tests is the difficulty of the questions. Also in this article the issue of

nature vs nurture came up. It has been a question for years if music is a learned skill or just a gift that some people have. "Music aptitude is a product of both nature and nurture" (Gordon, 1986, p. 18). though. It would be interesting to examine if students' decision to join band is based more on their personal interests (nature) or quality of musical instruction up to that point (nurture).

Beginning Instrumental Recruitment

Three articles were examined in regards to beginning instrumental recruitment. Different methods of instruction can impact which students join band and what instrument they are interested in playing. Instrumental demonstrations, movies/photos of instruments and recorder study are methods of motivating students to join band. Results showing how this impacts a student's decision to be involved in band vary.

Effects of Selected Recruiting Strategies on Beginning Instrumentalists' Participation Decisions

Two methods of instruction were used in this experiment to measure which group of students were more interested in joining band. The first group was taught the recorder and the second group were given demonstrations of instruments using movies and older students coming in to play. After 10 weeks students were given an attitude assessment to find out if they were interested in joining band.

> Both of the recruiting strategies used in this study are grounded in cognitive theories of motivation that focus on the individual's awareness of what is happening in his/her

> environment and his/her deliberate tendency to anticipate the future, to plan, and to take risks. The use of recorders, for example, as a prelude to beginning study on a traditional band or orchestra instrument, is grounded in the conception of achievement motivation as proposed in the classic studies of Atkinson and McClelland.....more recently by Asmus (Nierman, Veak, 1997, p. 381).

To measure the results of this study, Gordon's Primary Measures of Music Audiation and a Survey of Fourth-Graders' Interests (Likert-scale questionaire) were used. In the results between these aptitude and attitude scores it was found that ability and desire are decently unrelated when it comes to wanting to play a band instrument. Also in the results it was found that "the concrete experience of playing recorder is more effective than a demonstration curriculum or no instruction of any kind in increasing students' selection of playing an instrument over other activities" (Nierman, Veak, 1997, p. 387) for high SES (social economic status) students. The type of instruction made no difference for low SES students.

This study is strikingly similar to the experiment designed in this paper, except the researcher will compare recorder instruction with keyboard instruction, since they are both a hands-on instrumental approach. This will hopefully take away some of the variables present in this previous study that different types of learners may face. This experiment will help to find which students have the best content knowledge and desire to be in band.

An Assessment of Musical Instrument Preferences of Third-Grade Children

> The purpose of this study was to test the effects of three conditions of musical instrument demonstration-a clarinet biased condition; an unbiased, full demonstration condition; and a photos-only condition-on preferences for those instruments by third grade students (Byo, 1991, p. 21).

In 1982 LaBlanc developed a theoretical model of things that may contribute to a student's decision to be involved in music, and if so, what instrument. It was found that there is much gender bias in choosing what instrument to play. For example, flute and violin are preferred for girls and drums and trumpet for boys.

This particular study was done with third grade students, since it was the year before they began band. At the end of the three types of instruction students were asked to choose which beginning band instrument they were most interested to play (flute, clarinet, alto saxophone, trumpet, trombone and snare drum). A pre-test and post-test model was utilized and then a Kendall Measure of Concordance "was computed to measure the degree of association" (Byo, 1991, p. 26) between the two tests. The results showed that saxophone was first in all categories (clarinet bias, equal bias and control group) and the rest of the instruments showed no correlations after the instruction. The final conclusion was that "instrument presentation mode may have had an effect on third graders' preference responses and suggests that purposefully biased approaches to recruiting instrumentalists may be used to affect change in students' attitudes" (Byo, 1991, p. 29).

This study was interesting because it also worked with third grade students to measure an opinion about beginning band. This paper's study is similar because it is going to measure opinions about band after two different forms of instruction. It may be interesting to include 'what instrument would you like to play?' as part of the questionnaire the students will have to complete at the end of the study.

The Role of Musical Aptitude, Intelligence, and Academic Achievement in Predicting the Musical Attainment of Elementary Instrumental Music Students

Three types of tests were used in this study to help predict musical skills in elementary instrumental students in the fourth grade. They included Musical Aptitude Profile (MAP), Lorge-Thorndike Intelligence Test (IQ) and Iowa Tests of Basic Skills (ITBS). The conclusion of the study was made up of two types: "aural perception of rhythms, melodies, and instrumental improvisation" (Young, 1971, p. 395) and the other "intellectual abilities, such as music reading and notations" (Young, 1971, p. 395). The MAP tempo and rhythm tests and the ITBS vocabulary tests were the biggest predictors of who would remain in the program. The Watkins-Farnum Performance Scale was used to score musical performance in this study. This is related to this paper's study because the researcher was debating which form of evaluation to use for the recorder and keyboard students (multiple choice, performance, etc.). The researcher was also interested in studies on beginning instrumental music and achievement predictors with it.

Other

There are other factors involved in this study including styles of research and multiple intelligences. Articles were examined on these topics to make sure the correct style of research was used and that various types of learners would be reached.

A Content Analysis of Quantitative Research Dissertations in Music Education

"The purpose of this study was to analyze the contents of music education dissertations written from 1998 through 2002 that used qualitative research methods" (Kantorski, Stegman, 2006, p. 63). Five characteristics of a qualitative study were used to clarify studies. This study was important since qualitative research is gaining popularity in the field of music education. The most common qualitative studies were of multicultural interests and music programs.

> It was not surprising that these topics appeared so frequently, often in the same dissertation, given qualitative research's roots in anthropology and related fields that study groups of people and how they function and organize themselves within their cultures (Kantorski, Stegman, 2006, p. 70).

This study is related to my work since I will be using a mixed method approach.

Multiple Intelligences Go to School: Educational Implications of the Theory of Multiple Intelligences

Howard Gardner's stress on different types of intelligences has been used in the classroom for years. They include logical-mathematical, linguistic, musical, spatial, bodily-kinesthetic, interpersonal and intrapersonal. Gardner was upset how just linguistic symbolization and logical-mathematical symbolization were the main stresses in school. He also realized that "linguistic and logical capacities was overwhelming in the construction of items on intelligence aptitude, and achievement tests" (Gardner, Hatch, 1989, p. 5). He instead defined intelligence as "the capacity to solve problems or to fashion products that are valued in one or more cultural settings" (Gardner, Hatch, 1989, p. 5) and he created criteria to count as human intelligence. Since music testing does not typically fall into a standardized testing realm it is important to realized how other types of tests can help evaluate the whole student, not just one particular type

of learner.

Chapter 3

METHODS AND PROCEDURES

Experimental Method

This study compared results of students who were taught the Music In Education (MIE) keyboard versus the flutophone. The Bastien Piano Basics-Level 1 Book by James Bastien and Recorder Karate by Barb Philipak were utilized as the method books. Students were instructed for six weeks in the appropriate book according to their classroom. The school and parents gave permission for this study to take place (permission letter found in appendices A & B). Of the four third grade classes, two were instructed with flutophones and two with MIE keyboards. The school has a MIE keyboard lab that was utilized for half of the instruction. The flutophone instruction then took place in the music classroom next-door. Both classrooms provide a good learning environment for students. As the flutophone students earned 'belts' the piano students earned colors on a rainbow. Since the project took place around St. Patrick's Day, the ultimate goal for keyboard students was to obtain a 'pot of gold' attached to the rainbow. For the flutophone students their ultimate goal was receiving the 'black belt' (made of a simple piece of yarn). This allowed the issue of extrinsic motivation to be similar for both types of instruction.

The students that used the two different methods were taught correlating notes, rhythms and difficulty of songs. The order they were taught varied between the flutophone and keyboard depending on which song students were preparing to play next. The common flutophone and keyboard notes learned were then some of the ones to appear on the general music assessment.

Both groups were also taught typical musical terms like 'repeat' and 'treble clef.' This study then examined factual information and opinions of the students.

Review of the research goals

The researcher believes that after six weeks of instruction on the keyboard and flutophone, the general musical knowledge level on the test will be comparable between the two groups, showing no major difference between the two forms of musical instruction. The researcher also thinks students will have equal interest in joining band. After instruction, the researcher believes that the flutophone group will have a higher interest in playing a woodwind instrument over the MIE keyboard students. Through this study, the researcher will determine what type of instruction (flutophone or MIE keyboard) will be best for students at this particular school in the future.

Subjects

The subjects in this study were four classes of third grade students. The starting instrument of each class was determined by a special circumstance. There was a 3rd grader with a family member who was dying and wanted to hear the child play the piano, so that class started in the keyboard lab. Consideration for this family provided a means of choosing which class would begin with which rotation. The students attend a predominantly middle to upper class

elementary school in western Pennsylvania. The students were a mixture of boys and girls with various levels of intelligence and behaviors.

Equipment

The students throughout the project used the MIE keyboards by Yamaha. The keyboards may be split so that two students can play on each instrument, but hear notes in the same register. Speakers can be turned on or off separately to allow students to individually play for the class or to play quietly with headphones. The lab has fifteen stations, which can accommodate up to thirty students. One major difference between this classroom compared to a room of pianos is that students can practice quietly and individually while the teacher tests students. It also allows students to play together with a partner or practice individually. MIE has much research to prove it's reliability in the world of music instruction. For example, in 1999 a comparison by Carole Luzio from Wright State University was done between fifth grade students. Half were instructed with the MIE keyboards and the other half used a traditional textbook-based program. Results showed that the reading mean increased by 11.5% compared to 5.97% and math mean of 10.87% instead of 3.54% (Luzio, 1999). In the current education world, which is driven by standardized testing, these results exceed expectations.

There are various lessons and tests built into the MIE system. When using the MIE computer system, the lessons can be found by clicking on 'lesson book' on the side and then 'modules' on the top. "Module 7-Music Alphabet, Lesson 2-Alphabet Song: sing & move" will be used with the students. Since knowing the notes of the musical alphabet is necessary to read

piano music, this lesson was relevant. Below is the specific layout of this lesson, taken directly from the MIE program.

> Play song & sing the melody
> -track the words of the melody as they listen [follow the lyrics]
> -sing the words of the melody within the song
> -discuss the pitch direction of each phrase
> -sing the melody using 'la'
> -shape the melody as they sing with the song

The 'alphabet song' allowed students to play up and down the musical alphabet on their keyboard. The flutophone students were responsible for the same information, but it was shown on the board instead. This assisted in the focus on basic notes, rhythm and musical terms on which students will be tested at the end of the study.

The MIE system also has tests that are designed to allow the students to respond using the 'Enter' button on their keyboard. There are two buttons to provide for both students sitting at the keyboard. This eliminates the need for computers, paper or any other form of assessment. These answers then transfer to the teacher computer to show results. These tests will not be used in this experiment because they do not directly relate to the content being taught.

The lesson schedules, as well as the particular songs used for testing are found in Appendix E. It is important to note that though content was taught in a different order with each study, by the end of the six weeks the students were taught exactly the same information. Also, the experiment took slightly longer than six weeks to complete due to state achievement testing in the public school.

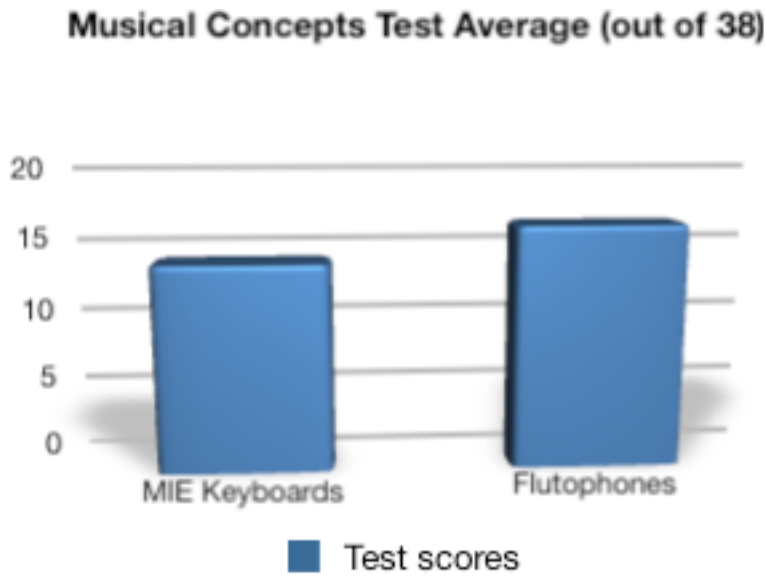
Chapter 4

RESULTS

Analysis of Data

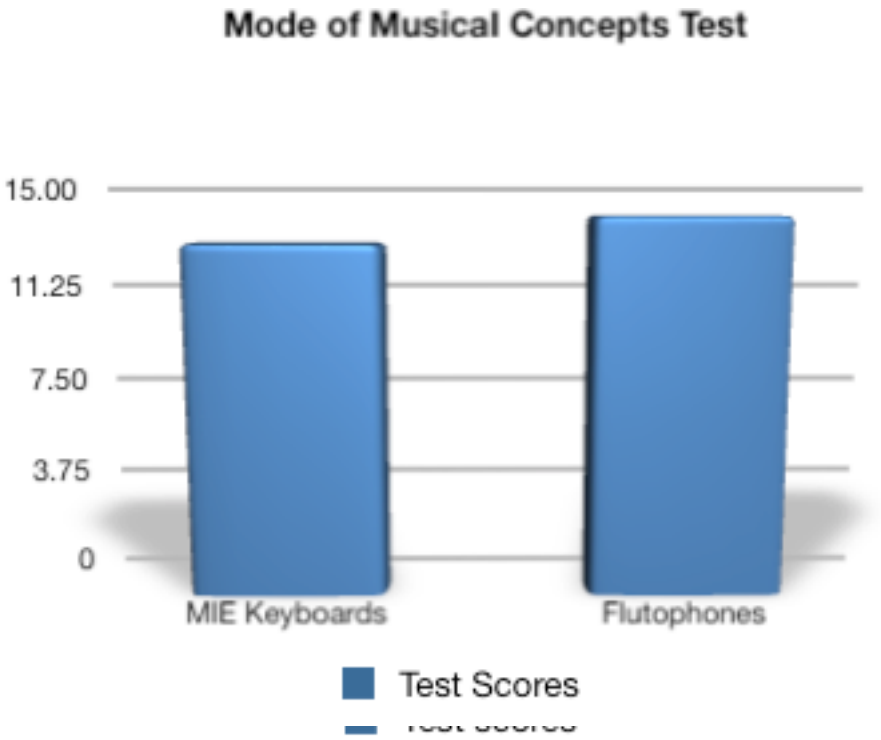
One hundred 3rd graders took a written musical concepts test (found in Appendices C & D) to determine if the method of instruction (MIE keyboards or flutophones) impacted their musical knowledge at the end of a six-week unit. Due to state achievement testing, the experiment lasted slightly longer than the original six weeks planned. Two students were eliminated from the study, due to extended absences at the end of the project. This worked perfectly to allow the study to have exactly 100 participants. Each of the four classes met two days a week (12 classes total) and had the same music instructor.

Overall, each of the classes did worse than expected on the 38 point written test. The average of the MIE keyboard students was 14.1/38 and flutophone students 16.52/38. A graph of these statistics is shown below. Part-way through the experiment, the keyboard testing songs had to be restructured because the students were not learning them as quickly and easily as anticipated. Due to this change, the researcher expected the MIE keyboard scores to be lower than the flutophone students at the end of the study and this proved to be true. The difference between the two groups was not statistically significant though. A one tailed, equal variance t-test revealed that the difference was 0.074, which was not statistically significant at the 0.05 level. These statistics prove the hypothesis stated at the beginning of the project, that the mode of instruction would not impact students' overall performance on a written musical test.



Throughout the project the researcher also observed that students did not test for colored belts/colors on the rainbow as quickly or easily as anticipated. The pre-test showed that students came into this study with no prior knowledge, so each of the classes still showed improvement. This observation made throughout the study, showed that for a 3rd grade level, the expectation of so many playing tests was too great and the final written test was too difficult. The instructor also gleaned some ways to make the unit more successful next time.

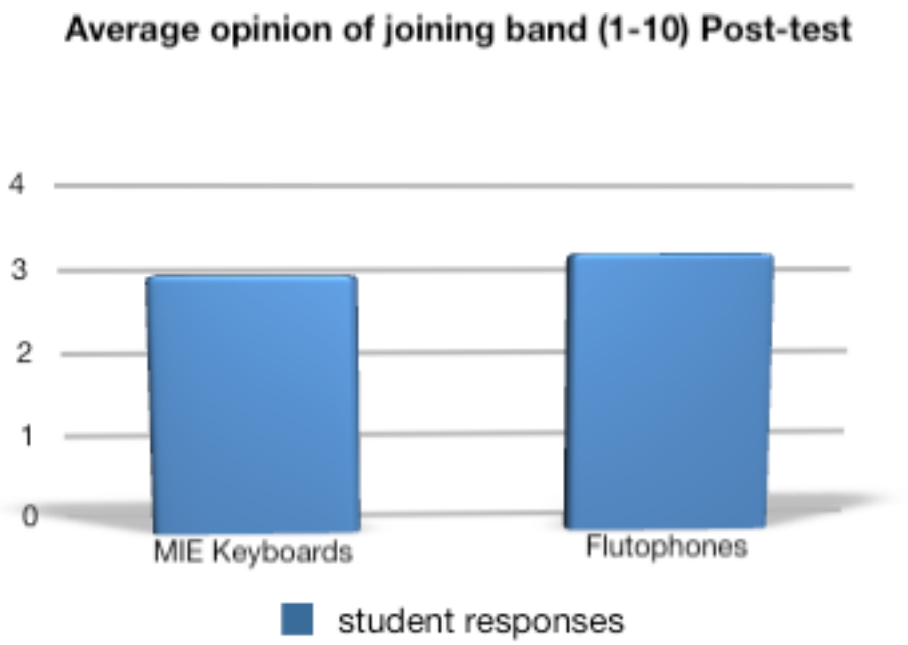
The median was calculated for the MIE keyboard and flutophone classes. The researcher wanted to determine if a few low papers were pulling down the entire class average. One of the individual classes had the lowest overall average, but the researcher observed a few of the most intelligent and excited students in the grade. This classroom earned the most ‘black belts‘ of the entire grade. 13/38 was the MIE keyboard data and 14.5 was the flutophone data. A graph is pictured below demonstrating these statistics.



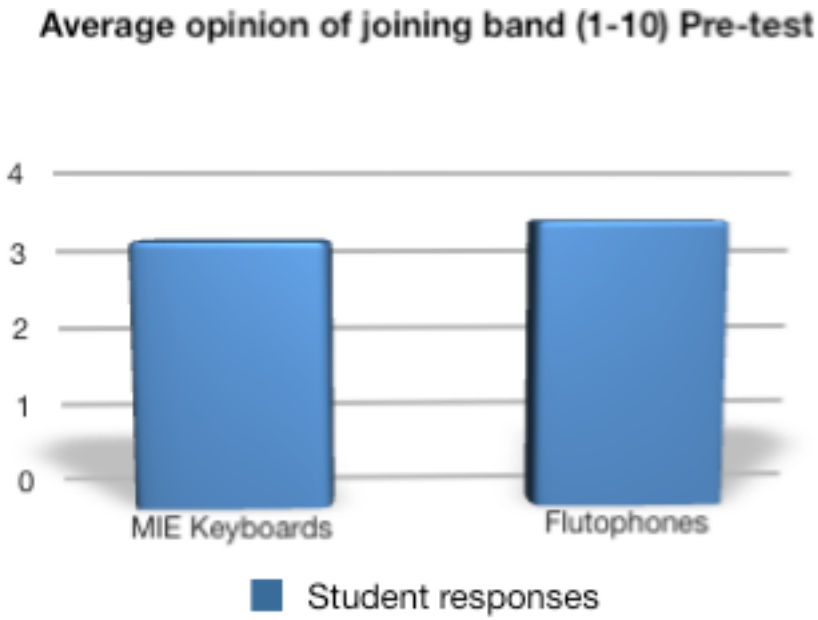
The mode was also determined for the MIE keyboards and flutophones. The result for the MIE keyboards was 13 and the flutophones was 14. These statistics showed similarity between the median and the mode for this experiment.

Students' opinions were also a major portion of this experiment. A copy of the opinion test students were given can be found in Appendix C. Students were asked to rate on a scale from 1-10 (10 being the highest) how interested they were in joining band. Overall, the 3rd graders did not rate this question as highly as anticipated. Statistics were calculated on pre and post tests. It was interesting to note that both times, the flutophone students were more interested

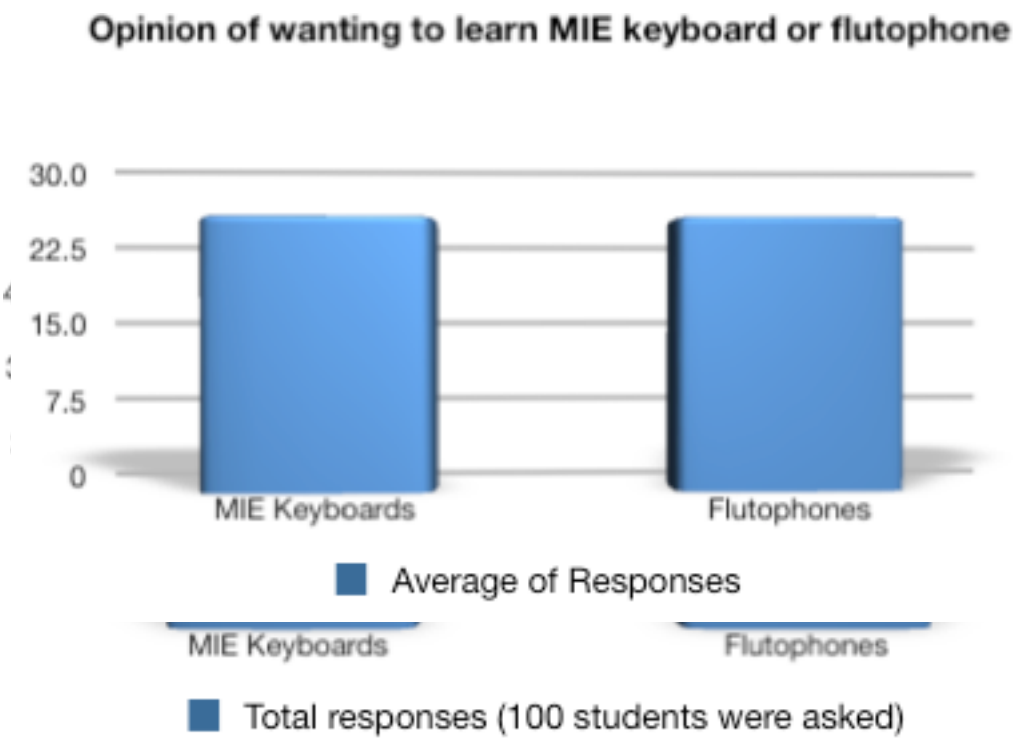
in joining band than the MIE keyboard students. It was also a surprise to find out that both groups of students were more excited about doing band before the experiment than after. This was also unexpected for the researcher because of the enthusiasm shown by students in the classroom. For example, the researcher opened the music classroom during the 3rd graders' recess time and allowed them to come in to test for belt/colors. One of the first days this occurred, about 1/4 of the grade came. The researcher helps supervise recess 1/3 of the time at



this school and knows how much the 3rd graders look forward to that time of the day. It was unexpected that so many willingly gave up that play time to test for music class. It could, therefore, explain that these statistics (shown below) are probably a result of many of the students recognizing how much work is necessary to be an instrumentalist. A t-test showed that the difference of opinion between the MIE keyboard and flutophone students was not significant. The result of the one tailed, equal variance test was 0.4699.



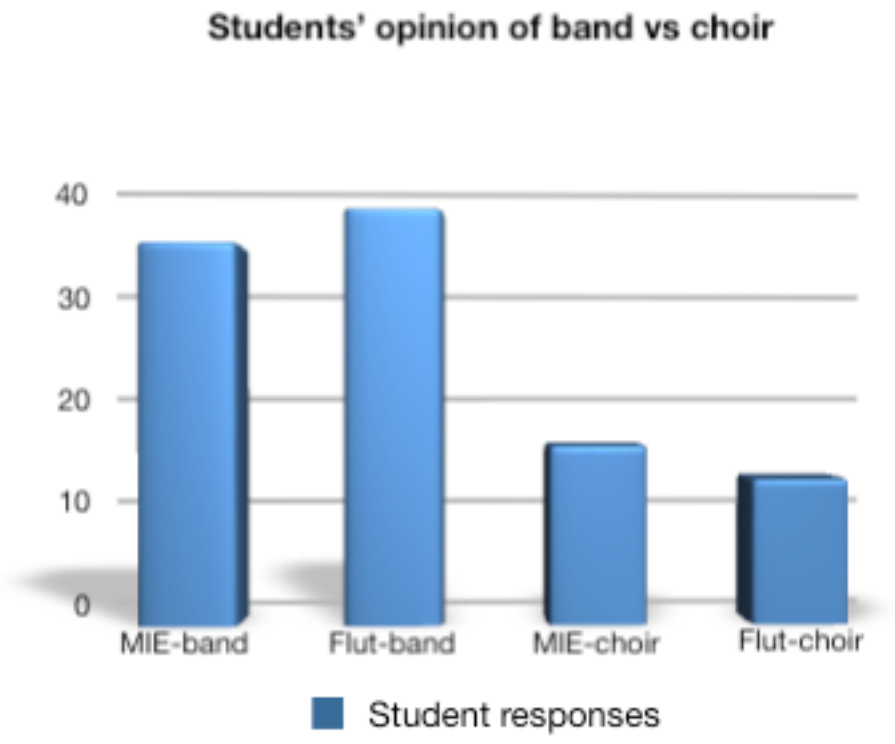
Students were asked on the opinion test which beginning band instrument they would be most interested in playing. The choices were: trumpet, trombone, saxophone, clarinet, flute and percussion. The researcher was interested after the experiment if the flutophone students would be more interested in playing a woodwind instrument than the MIE keyboard students. After the study, 28 MIE students were interested in playing a woodwind instrument and 31 flutophone students were interested in playing a woodwind instrument. The researcher's hypothesis stated that the flutophone students would be more interested in playing a woodwind instrument than the MIE keyboard students. Though the graph below shows this to be true, the t-test value of 0.4899 is not significant enough to link it with the students' mode of instruction. It was also determined that 34% of students were interested in playing the flute in band and 21% in percussion. These are typically the most popular band instruments, so these statistics were not a surprise. It is also interesting to note that when students could write in any instruments on which they would like to have lessons, 23% said drums and 21% said keyboard/piano. This shows that the piano was more popular among students than the flute.

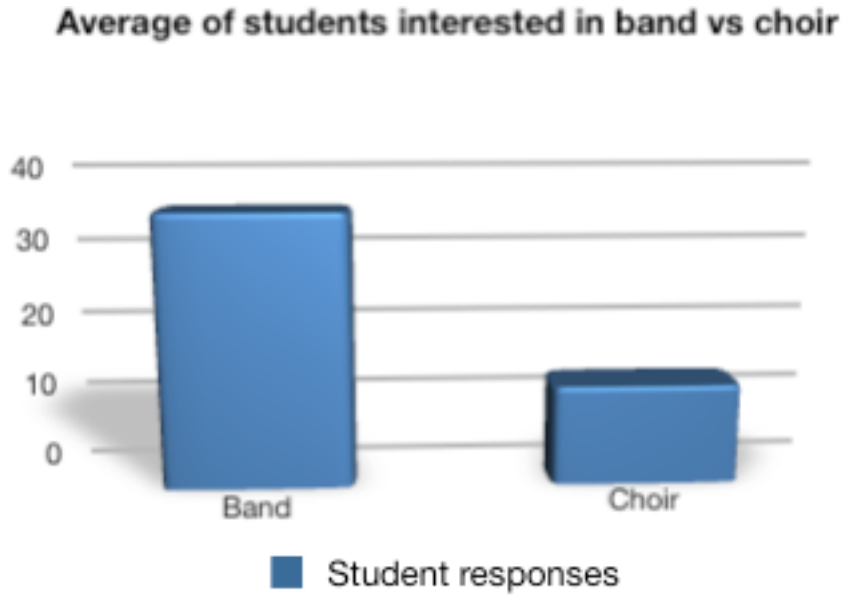


The opinion test then asked students if they could choose between learning music on the MIE keyboard or flutophone, which would they would prefer. Students expressed a similar interest in the keyboard and flutophone in the pre-test, but an identical interest in the post-test. These statistics are shown in the graph below.

The final question of the opinion survey asked students if they could choose between joining band or choir after this instruction, which would they prefer. Since this experiment was

designed to encourage participation in beginning band, the researcher anticipated band to be the response chosen more often. In the post-test, 71 students (71%) chose band and 29 students (29%) chose choir. (graph shown below) The pre-test also had a similar response with 74% choosing band and 26% choosing choir. This difference between the MIE students' responses and the flutophones students' responses are shown in the other graph below. A one tailed, equal variance t-test was calculated to determine if the preference for band or choir was statistically significant on the pre-test of the two groups. It was not, since the t-test resulted in 0.292. A t-test of the post-test results after the experiment was also calculated. The result was 0.5, which was not significant for the post-test between the MIE keyboard and flutophone students. To make sure the the separate groups did not change, t-tests were calculated for the pre and post test data for the MIE keyboards and flutophones individually. The MIE keyboards had a t-test value of 0.432 between the pre and post test scores, which is not significant. The flutophone students had a t-test value of 0.375, which was also not significant. The raw data revealed that, 34 MIE keyboard students chose band and 16 chose choir. For the flutophones, 37 students chose band and 13 chose choir. These results are positive for recruiting for the 4th grade band program at the school. Choir is part of the general music classroom at this school until 7th grade, so there is time to motivate students to choose choir. All of these statistics prove the hypothesis to be true that the instrument on which the students were instructed would not impact their desire to join band. The data does show that the whole grade had a significant preference for joining band over choir.


Students' opinion of band vs choir
40
30
20
10
0
MIE-band
Flut-band
MIE-choir
Flut-choir
Student responses


Average of students interested in band vs choir
40
30
20
10
0
Band
Choir
Student responses

Chapter 5

SUMMARY, CONCLUSION, RECOMMENDATIONS

Summary

The performance of 3rd grade students on a written test of basic musical knowledge was not impacted by the instrument on which they were trained. Students overall earned lower grades than the teacher anticipated, but they were equally low for both types of instruction. This proves the researcher's hypothesis that the instrument which students study is not as important as how the teacher presents the material and which information is taught.

3rd graders' opinion of joining beginning band was not significantly impacted by which instrument they studied. This information showed the researcher's hypothesis to be correct that

the type of instrumental instruction would not impact the student to be more or less interested in joining band. It was interesting to note though that the average went down, rather than up, on the post-test in this category. This was surprising to the researcher because the students were committed and enthusiastic throughout the study. It was also hypothesized that flutophone students would be more interested in playing a woodwind instrument than MIE keyboard students. This proved to be incorrect, because both groups expressed a similar interest in playing a woodwind instrument. Also, students' preferences between a desire to be instructed on the MIE keyboard or flutophone did not result as a significant difference.

When students were asked if they would rather be a part of band or choir, the overwhelming majority (for the pre and post tests) chose the band. The researcher assumed this would be the case since this unit was designed to promote beginning band. The difference was significant though, comparing MIE keyboard and flutophone students, as well as the entire grade level together.

Conclusions

After the conclusion of the project and statistical analysis it is apparent to the researcher/teacher that the students could indeed benefit from hearing the same information again when students switch units later in the school year. Hopefully this will help students with the gaps of knowledge they demonstrated on their written test. It is also shown that if a teacher presents two types of instruction with equal enthusiasm, that results will be similar among the students.

This shows that the flutophone does have value in the classroom to prepare students for band, but it isn't the only way to get them excited about an instrumental program. The daily classroom environment also showed the researcher that the flutophone was easier for students to learn than the keyboard. This, along with the responsibility aspect of students owning their own for practice, could be why flutophones are still used in the elementary music classroom (especially when there are so many more technological options).

In reverse, the experiment also proves the value of technology in the classroom. It shows that using the keyboard with which the students/parents can more directly relate, can be just as valuable. Flutophone instruction ceases when students join band, but keyboard instruction can sometimes continue, to the point of a student acquiring private piano lessons. This could be the beginning of a life-long skill for the children.

Recommendations

It is recommended that this experiment be repeated with other groups of third grade students in other schools to see if the results are consistent among states, school settings, family support systems and financial backgrounds. It is also recommended that various teachers instruct the classes since years of experience could have a result on the final outcome. It could also be interesting to do a follow-up study the next year to see which students joined band (MIE keyboard or flutophone) and which group is doing better in that setting. Including more of the MIE specific tests and lessons into a similar experiment could also be an interesting added component.

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Appendix A:

Permission was attained from the Neshannock Township School District

(Memorial Elementary School)

Appendix B:

Dear third grade parents,

The past two summers I have been working on my master's degree in Music Technology-Education Focus through Valley Forge Christian College. As part of the fulfillment of that program, I am required to write a thesis based on an educational experiment involving technology. After much consideration, I have decided to learn about the difference in instruction between teaching third graders the flutophone and keyboard. Flutophones are utilized to prepare students for joining band the following year. I am curious if teaching the keyboard, an instrument that can be more of a life-long skill, would have the same positive affect. I want to make sure each parent understands exactly what will be happening to feel comfortable with the research project.

I am splitting the third grade into two groups and teaching flutophone to two classes and keyboard to the other two classes for this experiment. It is important to note that after the six weeks experiment, I will be instructionally rotating so that each child gets to experience learning the opposite instrument. I am excited to see if the two instruments have any impact upon the level of knowledge the student has after six weeks of instruction or their opinion of joining band the following year. I will use these results to aid in instruction in the following years at Memorial Elementary School. Please know that your child will never be identified as part of this project and their scores will be kept in confidence and only used as part of the overall group. Thank you for your support and please do not hesitate to contact me with any further questions

you may have. My email is: bbaker@neshannock.k12.pa.us If I do not hear from you in written or email format by the end of January, I will assume that is is okay to move forward with your child as part of the project. Thanks so much and I look forward to working with your child this semester.

Sincerely,

Miss Baker

Appendix C:

Instrumental Opinion Survey

1. On a scale from 1-10 (one being least and 10 being most) how interested are you in joining band next year? (please circle one answer)

1 2 3 4 5 6 7 8 9 10

2. If you could have private lessons on any instrument, what would it be?

_____

3. If you could choose any beginning band instrument to play, which would it be? (please circle one answer)

Trumpet Trombone Saxophone Clarinet Flute Percussion

4. If you could choose between learning music on the keyboard or the flutophone, which would you choose? (please circle one)

Keyboard Flutophone

Why did you choose that one?

_____

5. Have you ever taken piano lessons before? If so, please list how many years you have received instruction. _____ yrs

6. If you had to choose between joining band or choir, which would you choose? (please circle one answer)

Band Choir

Why did you choose that one? _____

Please list classroom teacher's name: _____

Appendix D:

Name: _____ Teacher's name: _____

WORD BANK:

Bass clef	breath mark	fermata	repeat sign	sharp	slur	tie	treble clef

Please identify (name) the following symbols in music. Each is used one time from the word bank above.


_____

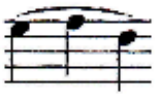

_____


_____


_____

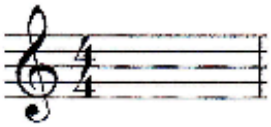

_____

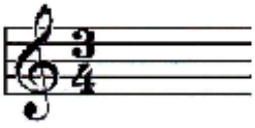

_____


_____


_____

How many beats are in each measure? (using these time signatures)


_____ beats


_____ beats

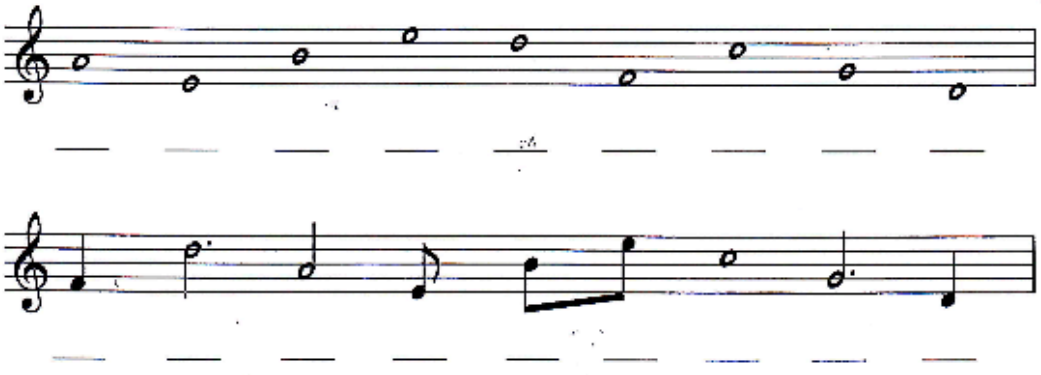
Practice Counting

In the space provided, write how many beats each note or rest equals:

1.  _____beat(s)
2.  _____beat(s)
3.  _____beat(s)
4. _____beat(s)
5.  _____beat(s)
6.  _____beat(s)
7.  _____beat(s)
8.  _____beat(s)
9.  _____beat(s)
10. _____beat(s)

Practice Naming The Notes

Write the letter name of each note in the space provided:



Appendix E:

Lesson Schedule

Keyboards

Day 1-hand out books, how to work keyboards, how to hold hands to play piano (slightly curved), white and black keys, finger numbers, pre-test
Day 2-different types of pianos, whole note, half note, quarter notes, f & p dynamics
Day 3-black keys songs, repeat, musical alphabet (with white keys)
Day 4-treble clef, bass clef, lines/spaces, grand staff, steps/skips
Day 5-C position, 4/4 time signature
Day 6-3/4 time signature, tie, slur
Day 7-harmony, intervals, quarter rest
Day 8-key signatures, F#
Day 9-eighth note, dotted quarter notes
Day 10-whole rest, half rest
Day 11-fermata, dotted half note
Day 12-post-test, finish testing

Rainbow colors/Song Titles

red-Merrily We Roll Along pg. 6 Alfred (black keys)
orange-The Ski Lift pg. 11 Alfred (middle C position)
yellow-Go Tell Aunt Rhodie pg. 27 Bastien (treble clef)
green-Ode to Joy pg. 29 Bastien (bass clef)
blue-Ballons pg. 21 Alfred (slur)
purple-Rock Song pg. 25 Alfred (chords-hands alone)
pink-Rockets pg. 26 Alfred (chords-hands together)
sun-Sea Divers pg. 27 Alfred (rests)
pot of gold-When the Saints pg. 41 Alfred

Partway through the experiment it was obvious that the keyboard students were not learning concepts as quickly as expected. To avoid frustration among the students and to review beginning concepts, the song list was changed for the keyboard students. This week of frustration could affect the end results of the experiment, though the concepts taught each day did not change from the original project design.

Rainbow Colors/Song Titles-Adapted

red-Merrily We Roll Along pg. 6 Alfred
orange-Ski Lift pg. 11 Alfred
yellow-C Song pg. 26 Bastien
green-Skipping Fingers pg. 27 Bastien
blue-Go Tell Aunt Rhodie pg. 27 Bastien
purple-Ode to Joy pg. 29 Bastien
pink-Ballons pg. 21 Alfred
sun-Skipping Frogs pg. 44 Bastien
pot of gold-Noah's Ark pg. 35 Bastien

Flutophones

Day 1-hand out packet, rest position, ready position, how to hold, how to blow (warm air, blow slowly, no air escaping through holes), rules (warning and then lose mouthpiece)
Day 2-pre-test, which part of finger to play flutophone with, history of recorder, tonguing vs slurring, musical alphabet, B, A G
Day 3-4/4 time signature, whole note, half note, quarter note, half rest, breathe mark
Day 4-treble clef, bass clef, lines/spaces, grand staff
Day 5-double eighth notes, E
Day 6-quarter rest, dotted half notes, low D
Day 7-tie, slur, high C and D
Day 8-key signatures, F#
Day 9-eighth note, dotted quarter note, fermata, 3/4 time signature
Day 10-f & p dynamics, middle C, F
Day 11-repeat sign, whole rest, harmony
Day 12-post-test

Belt Colors/Song Titles

white-Hot Crossed Buns
yellow-Gently Sleep
orange-Merrily We Roll Along
green-It's Raining
purple-Old MacDonald

blue-When the Saints
red-Twinkle, Twinkle Little Star
brown-Amazing Grace
black-Ode to Joy