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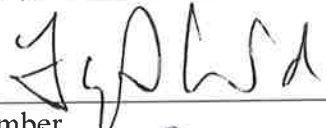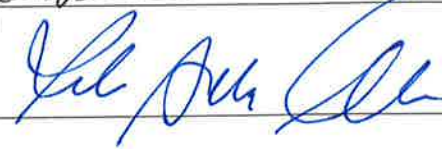
The Success of Learning Music Vocabulary Using SMARTBoard Technology

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Master of Arts in Music Education

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Abstract

This thesis examines the utilization of SMARTBoard Technology in the vocal music classroom for student acquisition of music vocabulary terms and the level of success associated with the use of the technology tool. Teachers typically introduce information to students through traditional instructional methods that have been utilized for decades. Vocal music classes have begun using technology teaching tools to facilitate instruction. The research in this study investigates the integration of SMARTBoard in the vocal music classroom for instructional delivery and student learning of music vocabulary terms.

Research Question

1. What are the benefits, if any, of using SMARTBOARD for the acquisition, retention, and application of music vocabulary terms?

Chapter 1

Introduction

The use of SMARTBoard technology for the instruction of curriculum material has proven beneficial in high school fine arts curricula. High school music students have always been required to learn music vocabulary terms. SMARTBoard may provide an opportunity for instruction of vocabulary terms that appeal to the modern, technology driven learning styles. Born in the age of technology, the current generation of high school students is often referred to as "digital natives," having a high level of understanding of technological devices (Baker, 2007). With SMARTBoard, teachers may have the ability to provide another method of interactive instruction to high school students with varied learning styles. The acquisition and retention of music vocabulary is a requirement for the vocal music student as mandated by the National Standards for Music Education. In order to comprehend and implement the necessary vocabulary terms, students must be given ample opportunity to obtain, review, and synthesize the necessary information (Wiggins & Ruthmann). SMARTBoard may provide teachers access to online unit and lesson plans that incorporate vocabulary terms and actively engage students. Teachers may access the internet to gather and display information and incorporate movies, films and music into daily lessons (Langdon-Pollock, 2007).

High School vocal music classes in the United States generally include students in grades nine through 12. Any student from 12 to 21 years of age may be assigned to the same class. All students enrolled in a vocal music class for the first time in high school are assigned to the same class, regardless of age. Class composition may include groups of students whose musical backgrounds and abilities range from privately instructed

vocalists and instrumentalists to those who have received only a basic elementary music education. Most students received general music instruction during elementary school, and many of the students participated in band, orchestra, or chorus in middle grades. Some students elected to participate in subjects other than music in the middle grades and renewed their pursuit of music in high school. High school music classes include students from all of these categories as well as populations of students requiring differentiated instruction. Often teachers must provide instruction to students with individualized education plans (IEPs) and academically gifted students within the same class setting. Teachers implement instructional and grading modifications as mandated by the student's plan. As a result of the scheduling of multi-faceted students in one class setting, differentiated instruction is essential. It is necessary to provide effective lesson delivery that addresses varied learning styles and abilities. Students experiencing mental deficiencies or limited motor skills are frequently assigned to vocal music classes because they "like to sing." School guidance counselors assign students to vocal music classes as a means of aiding the students' success. Many counselors may perceive vocal music as "an easy class," and one that "any student should be able to pass." Counselors attempt to schedule students in classes in which differentiated instruction and cooperative learning may be easily incorporated. Utilizing SMARTBoard may create interactive learning environments conducive to the promotion of cooperative learning thus aiding the delivery of differentiated instruction.

Satisfying the curriculum requirements for the high school vocal music curriculum mandates the use of technology in the classroom. The Essential Standards adopted by the State of North Carolina, instituted by the North Carolina Department of

Instruction require that vocal music students compose music using technological sources (NCDPI Essential Standards, 2012). One method of facilitating technological instruction may be realized with the use of SMARTBoard. Further, in the teacher evaluation tool currently employed by the State of North Carolina, teachers are also required to incorporate technology in the classroom (NCDPI). Utilizing SMARTBoard may provide an opportunity for students and teachers to satisfy the established curriculum and evaluation requirements as set forth by the NCDPI. In order to maintain a North Carolina teaching license and retain teaching credentials, educators are required to obtain one continuing education unit (CEU) of instruction in a technology course during each contract period.

Core curriculum classrooms have been equipped with the necessary technology tools and devices. Arts education classrooms are in need of the same technology. The instructional versatility of SMARTBoard provides credence to the necessity for such tools not only in the "core curriculum" classrooms but all areas of instruction.

Chapter 2

Literature Review

The SMARTBoard was first made available for sale and distribution in 1991 by David Martin, the co-owner of SMART Technologies in Alberta, Canada. It is an interactive device that resembles the standard whiteboard used in business and classroom settings. The SMARTBoard functions as a touch-screen computer when paired with an LCD projector allowing the user to provide information to large audiences. Lessons taught with SMARTBoard are easily viewed by an entire class. Presentations may be manipulated by simply touching the screen. Teachers have the ability to overlap handwriting with the displayed text to create specialized notes for a class. Using electronic SMARTBoard pens enables the user to write over notes and applications. All details viewed on the SMARTBoard may be posted to a web browser for access and perusal at a later date. Instructors using SMARTBoard in the classroom have the ability to transmit notes and information directly from the SMARTBoard to cell phones, Ipads, and home-based computers. Teachers may transmit information directly from the SMARTBoard to a student at home or provide study guides accessible by electronic devices.

Literature related to the use of SMARTBoard in various venues is available from numerous sources. Information specifically related to the instruction of music vocabulary terms in the vocal music classroom was sparse. More literature exists regarding the general use of SMARTBoard in the vocal music classroom as a device for cooperative learning, video presentations and computer database searches and presentations. Information presented here addresses both situations as well as the use of SMARTBoard

in other educational settings. In one selection of literature, a comparison study was conducted to determine whether SMARTBoard was beneficial to music teachers during training sessions and staff development (Wiggins and Ruthmann, 2002). The study used videos of the training and staff development sessions to make a qualitative analysis as to the attention given to the instructor in each instance. Sessions conducted using SMARTBoard required less clarification of information by the instructor and resulted in fewer questions from the participants. Another finding was that cooperative learning was more easily facilitated, and the attention of the participants immediately obtained any time the instructor used SMARTBoard to present a concept or idea. The intent of the research design was to establish a model for learning that could easily be incorporated into the classroom. Three-hour technology workshops held for vocal music teachers used SMARTBoard in projection mode as a tool for giving instruction related to music composition programs. Follow-up interviews conducted with the participants and instructors rated the SMARTBoard as to its effectiveness. Videotapes of the training session were also reviewed and analyzed. The study revealed that educators new to the profession were more receptive to the use of SMARTBoard in the classroom than most veteran teachers. Conversely, the majority of the educators involved in the research study, regardless of years of service, agreed that SMARTBoard could be a highly effective tool for classroom instruction (Wiggins and Ruthmann, 2002).

The *Bulletin of the Council for Research in Music Education* published an article in 2012 studying technology-based music classes in high schools. The research reflected that 14% of the schools surveyed incorporated technology in the music classroom. Sixty percent of the school principals surveyed supported technology-based music classes.

Many of them expressed a positive likelihood that the classes could be equipped with the necessary devices. The researcher also noted that the educators surveyed indicated that individual music teachers designed the classes. The teacher generally designed the classes for nontraditional music students, students involved in classes other than band, chorus, or orchestra (Dammers, 2012).

Research has been conducted regarding the level of student engagement associated with the use of SMARTBoard. An online survey entitled *TUSD Smartboard Package Survey* indicated that student engagement increased with the addition of SMARTBoard in the classroom. Student learning improved, as did student behavior (Landon-Pollock, 2007). Of the teachers surveyed, 29.4% strongly agreed that SMARTBoard enhanced student engagement and 58.8% agreed. The same population of teachers polled indicated that 20% strongly agreed that behavior had improved while 37.6% agreed that behavior had improved. Of the teachers polled, 26.1% of the teachers strongly agreed that student learning had improved and 55.7% agreed. The standard seating arrangement for music classrooms typically involves students seated or standing in a semi-circular pattern with individuals in close proximity to one another. Discipline issues may create distractions to the learning process as individuals interact. Strategically locating SMARTBoard in the classroom so that it is visible from all quadrants of the room may provide teachers with another device to assist with interactive instruction thus reducing interruptions. Actively engaged students may diminish issues with discipline providing the teacher with the opportunity to deliver instruction for longer durations (Sing & Mohamed).

Of the teachers surveyed, some reported they never used SMARTBoard due primarily to the lack of available hardware, the SMARTBoard apparatus itself or a projector, or a lack of adequate training for the operation of the SMARTBoard. Some teachers reported that SMARTBoard has had a negative impact on learning in that the teacher is required to turn his or her back to the students during engagement. As a result, talking and other disruptive behaviors occurred, and the poor positioning of the equipment in the classroom made its use cumbersome and inconvenient. As stated previously, some teachers were not familiar with the technology and training has been inadequate. Some veteran teachers accustomed to delivering instruction via lecture and textbook methods found it difficult to incorporate the learning tool in daily instruction and adapt to the use of SMARTBoard. Training and instruction in functional use of the device was impersonal and was conducted en masse in crowded computer labs typically at the end of a school day or on a Saturday. Teachers regarded attending yet another training session as over burdensome. They reported a lack of enthusiasm with incorporating SMARTBoard in the classroom (Landgon-Pollock, 2007).

Subjects that have been studied regarding the success of SMARTBoard and the delivery of classroom instruction include the fine arts classes, physical education, social science, general education, special education, business and marketing, science, computer education, English, technology, family and consumer science, technical education, engineering, language arts, and mathematics. Evidence exists to suggest that student interaction increases, students express a renewed interest in learning, and socialization occurs which boosts self-esteem and cooperative learning (Singh, 2011). One study, *In Search of Important Research Questions in Music Education: The Case of the United*

States by V. Fung sought to identify the "pressing questions" related to music education. Professors at a major research university revealed that the most "pressing questions" were related to methodological concerns and foundational topics (Fung, 2008), both of which include music vocabulary. Music students, as communicated in the research, have a propensity to display more interest in the actual performance rather than gaining the necessary knowledge required to perform accurately. According to the study, the acquisition of the information provides minute opportunities for active engagement and interactive learning.

None of the articles reviewed directly addressed learning music vocabulary and SMARTBoard. Other musical ideas and situations were positively impacted with the use of SMARTBoard. Peer interaction and student-led positive reinforcement increased. Using SMARTBoard to project recorded rehearsals and demonstrations of techniques gave the performers immediate visual feedback and provided a visual and audible opportunity for teacher critique as well as student critique. Students were afforded the opportunity to immediately make adjustments in performances and correct mistakes expeditiously (Baker, 2007).

One aspect of the vocal music curriculum involves creation and performance of choreographed musical selections. With SMARTBoard, students may view recorded performances of choreography in other classes within the vocal music program allowing for fewer after school mass rehearsals. Students may have the opportunity to self-critique and respond with immediate feedback as to the accuracy of the choreography.

Chapter 3

Method

The setting for this action research study was a vocal music class at a high school located in rural Cumberland County, North Carolina. The room is located in the basement of the school building next to the bus parking lot and adjacent to the band room making it difficult to concentrate at times due to the volume of the instruments and noise from arriving buses. The beginning vocal music class meets daily for 90 minutes during the last period of the day, and students are often exhausted and anxious to leave school for the day. Approximately 20 minutes per class period is typically devoted to music theory using the rote system and SMARTBoard methods for teaching and learning music vocabulary terms.

The students (N=20) in the study included one class of beginning choral music students ranging in age from 14 to 16 years. The class was composed of 20 ninth grade students, 14 girls and six boys (*Figure 3.1*).
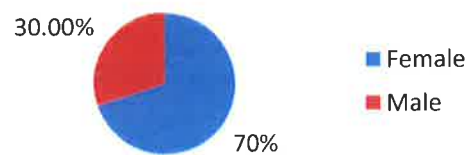
Figure 3.1. 14 female and six male students participated in the study.

The ethnicity consisted of nine white students, 10 African American students, and one mixed race student (*Figure 3.2*).
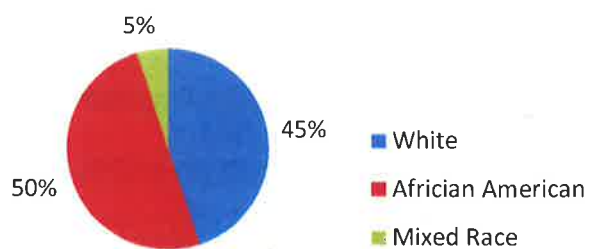
Figure 3.2. nine white students, 10 African American, and one mixed race student participated in the study.

The students were from various geographical and economical areas in the school district, some from more affluent neighborhoods than others. All students had equivalent lack of knowledge of the musical concepts presented for this research study. The terms were unfamiliar to all students participating in the study. Traditionally, these vocabulary terms are taught only to more advanced vocal music students in Proficient Vocal Music or Advanced Vocal Music curriculums.

Procedure

Permission was sought and granted by the principal of the school for an action research study (Appendix A). Following the granting of permission by school, proper authorization was acquired from the Institutional Review Board (IRB) at the University of North Carolina at Pembroke for research involving human subjects. Permission to conduct the survey was granted by the IRB, and access to the survey was provided to the student via computer based application. Students were given parental consent forms to gain acceptance for the student to participate in the study (Appendix B). Students returned the parental consent forms, with appropriate signatures, to the teacher. Students also signed a consent form (Appendix C).

A survey of four of the more difficult music vocabulary terms was made available on-line through the educational network site, *edmodo* (Appendix D). Students were given a password to access the survey document and were asked to complete the online survey prior to the beginning of the research study the purpose being to determine the participant's baseline of knowledge of the music vocabulary terms to be used in the study. The results revealed that the students possessed no knowledge of the music vocabulary terms that were to be presented during the study, as they related to music, as demonstrated by the responses to the initial survey *(Figure 4.1)*. The information gathered from the survey was used as a baseline indicator for comparison at the end of a two week study period. The teacher used an exit ticket, an information-gathering tool, daily to assess and analyze participant learning of the vocabulary terms. An exit ticket is the formative assessment tool that required students to submit written responses reflecting comprehension of the term for the day. At the conclusion of each instructional

period, the teacher used the exit ticket to assess the students' level of understanding of the term for the day. The teacher collected the exit tickets from the students each day immediately following the vocabulary lesson. The study was conducted for four two-day sessions, each session concluding with students being assessed on the vocabulary terms presented during the session. Students received instruction daily during the last five minutes of class on a music vocabulary term with traditional instructional methods on days one, four, five, and eight, and during days two, three, six, and seven, students were instructed with the use of SMARTBoard. The teacher attempted to avoid creating a bias by utilizing traditional instructional methods on the first day on the study. On the second day, the teacher retaught the term from the previous day with SMARTBoard. On the third day, the teacher used SMARTBoard to present a new term followed by instruction of the same term with traditional methods on the fourth day. On the fifth day, the teacher introduced a new term using traditional methods and retaught the term on the sixth day using SMARTBoard. On the seventh day, the teacher introduced a new term with SMARTBoard and retaught the term on the eighth day with traditional instructional methods. A script was followed for instruction of vocabulary terms so as to prevent bias based on the dialog used when the information was presented to the students. New vocabulary terms were introduced on days one, three, five, and seven.

The information was taught again on days two, four, six, and eight. Students were not allowed to ask questions but were instructed to listen to the information presented and synthesize the information as adequately as possible. Students were not allowed to take notes or otherwise create a record of the information presented on any given day. This discouraged the idea of "studying" the vocabulary terms prior to the presentation of the

information on the second day of each session. Students were also instructed to avoid

conducting any research outside of the class setting regarding the topics introduced in

class for the purpose of the study.

Chapter 4

Results

This action research project began with a baseline survey *(Figure 4.1)*. The students responded to questions with regard to their knowledge of music vocabulary terms. The terms used for the project were "half step," "whole step," "interval," and "major scale." The baseline survey revealed that the terms presented in the survey, as they related to music, were unfamiliar to the students. Typically, these vocabulary terms are taught to more advanced level vocal music students. The students in this study were all beginning level vocal music students in the Beginning Vocal Music class.
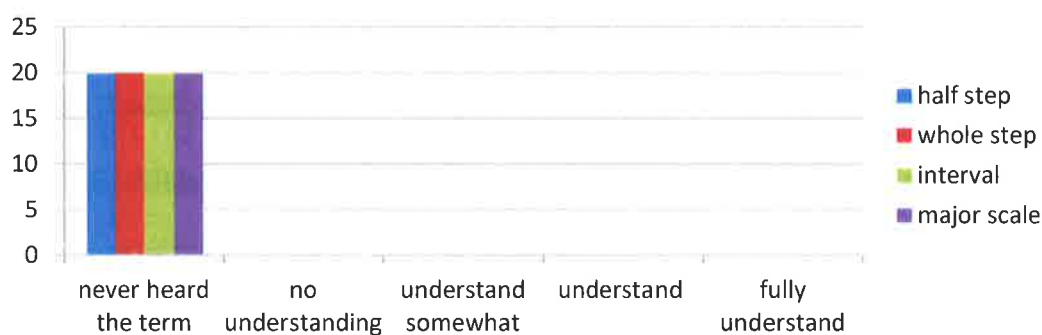
Figure 4.1. Student responses to baseline survey of familiarity with music vocabulary terms introduced in the study.

Both traditional instructional methods and SMARTBoard instructional methods were employed during this eight-day study. Traditional methods were used for the initial introduction of terms on two of the eight days, and SMARTBoard was used for initial introduction of the terms on two of the eight days. Traditional instructional methods were used for two of the eight days to reteach information, and SMARTBoard was used for two of the eight days to reteach information.

The first term, "half step," was introduced to students with traditional instructional methods. The vocabulary term was unfamiliar to this group of students. They heard the explanation for the term for the first time during this instructional period. The teacher placed an 18 x 6 inch card stock piano keyboard on the chalkboard tray and indicated the location of C, C#, and D on the keyboard. The teacher then stated that "a half step is the smallest distance on the keyboard, and moving from C to C# or C# to D is an example of a half step. You can't skip any note when identifying a half step." Students were invited to come to the chalkboard to demonstrate the location of a half step on the paper keyboard. All students came up, one at a time, and participated in the exercise. They touched the keyboard and demonstrated a half step on the keyboard. The students modeled the teacher's example of moving from C to C# or C# to D without deviation. After the students participated, they returned to their seat to await the completion of the exercise by the rest of the students. For the purpose of this study, students were given two response options that were considered correct for exit ticket answers. The first option was "two pitches beside each other without skipping anything." The other option was "moving from C to C# or C# to D." There were no responses that met any grading standard for being correct, a 0% pass rate from the 20 students (*Figure 4.2*).

Figure 4.2. Student exit ticket responses for the definition of the term *half step* after one class using traditional instructional methods, indicating 0% accuracy.

The vocabulary term "half step" was retaught to the students the following day with SMARTBoard. The teacher revealed an interactive piano keyboard on the SMARTBoard and indicated the location of C, C#, and D on the keyboard. The notes were audible as the teacher touched the keys. Students responded with statements such as "that's awesome" and "how did you do that?" The teacher then stated that "a half step is the smallest distance on the keyboard, and moving from C to C# or C# to D is an example of a half step. You can't skip any note when identifying a half step." Students were invited to come to the SMARTBoard and demonstrate the location of a half step on the interactive keyboard. Students seemed eager to participate and expressed surprise that they actually produced the sound of the notes as they played the interactive keyboard on the SMARTBoard. Students repeatedly asked for "another turn" during the exercise. Each student returned to his or her seat as they finished the demonstration and waited for further instructions. For the purpose of this study, students were given two response options that would be considered correct. The first option was "two pitches beside each other without skipping anything." The other option was "moving from C to C# or C# to D." Students responded with 100% accuracy on the exit ticket for the day *(Figure 4.3)*.
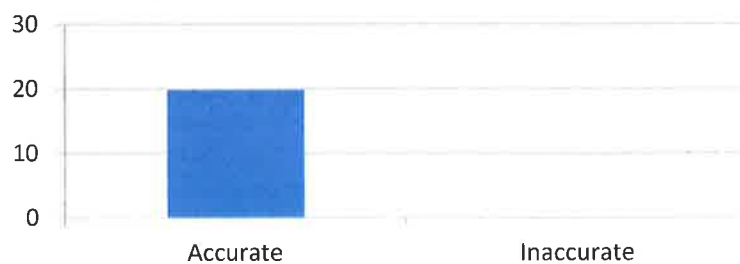
Figure 4.3. Student exit ticket responses for the term *half step* after one class using SMARTBoard preceded by one class using traditional instructional methods, reflecting 100% accuracy.

The students were next introduced to the vocabulary term "whole step" with SMARTBoard. As with the previous term, this group of students would typically be introduced to this vocabulary term in a subsequent semester. The term, as it related to music, was unfamiliar to the students. When the teacher approached the SMARTBoard, two students raised their hand and asked to be first with the demonstration. The teacher revealed the interactive keyboard on the SMARTBoard and indicated the location of C, C#, D, D#, and E on the keyboard. The notes were again audible as the teacher touched the keys. The teacher stated that "a whole step is two successive half steps, and moving from C to D or D to E is an example of a whole step. You must skip a note when identifying a whole step." Students were invited to come to the SMARTBoard and demonstrate the location of a whole step on the interactive keyboard. All students participated and accurately demonstrated a whole step on the interactive keyboard as modeled by the teacher. Two students demonstrated whole steps with notes other than the ones the teacher had modeled. All students asked for "another turn" with the SMARTBoard. For the purpose of this study, students were given two response options that would be considered correct. The first option was "two half steps beside each other." The other option was "moving from C to D or D to E." Students responded with 100% accuracy on the exit ticket *(Figure 4.4)*.

Figure 4.4. Exit ticket responses for the term *whole step* after one class using SMARTBoard, reflecting 100% accuracy.

Next the students were taught the vocabulary term "whole step" with traditional instructional methods. The teacher placed an 18 x 6 inch card stock piano keyboard on the chalkboard tray and indicated the location of C, C#, D, D#, and E on the keyboard. The teacher then stated that "a whole step is two successive half steps, and moving from C to D or D to E is an example of a whole step. You must skip a note when identifying a whole step." Students were once again invited to the chalkboard to demonstrate the location of a whole step on the keyboard. Initially, 18 of the students participated and accurately demonstrated a whole step as modeled by the teacher. One of the students asked if he "had to do it with the paper thing?" A second student nodded in agreement. With the encouragement of their peers, both of the students elected to participate in the exercise. One of the students pointed to C, C#, and D and accurately identified a whole step as modeled by the teacher. The other student failed to accurately designate a whole step. He declined participation in the "whole step" demonstration. He stated "I don't like this way." This student identified the term accurately on the previous day during the SMARTBoard lesson that taught "whole step." Students were given two response options that would be considered correct. The first option was "two half steps beside each other." The other option was "moving from C to D or D to E." Of the 20 students participating, 19 responded accurately on the exit ticket *(Figure 4.5)*.
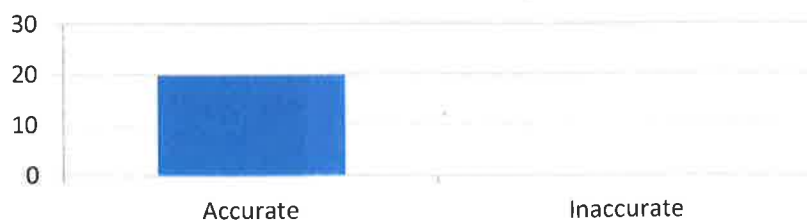

Figure 4.5. Exit ticket responses for the definition of the term *whole step* after one class using traditional instructional methods preceded by one class using SMARTBoard, reflecting 95% accuracy.

The vocabulary term "interval" was introduced to students initially with traditional instructional methods during the next class period. Once again, the teacher placed an 18 x 6 inch card stock piano keyboard on the chalkboard tray and indicated the location of C, C#, D, D#, and E on the keyboard. The teacher then stated that "an interval is the distance between notes, and moving from C to D or D to E is an example of an interval of a 2nd. Moving from C to E is an example of an interval of a 3rd." The students were invited to come to the chalkboard and demonstrate the location of an interval of a 2nd on the paper keyboard. Each student approached the board and, with hesitation, located the interval as modeled by the teacher. The teacher observed puzzled looks on the faces of the students as if they needed clarification in order to respond correctly. After each student had completed the exercise, he or she returned to their seat. For the purpose of this study, students were given two exit ticket response options that would be considered correct. The first was "the distance between notes." The other option was "moving from C to D or D to E is an interval of a 2nd." There were no responses on the exit tickets that met any grading standard for being correct, a 0% pass rate *(Figure 4.6)*.

Figure 4.6. Exit ticket responses for the definition of the term *interval* after one class using traditional instructional methods, reflecting 0% accuracy.

Students were next taught the vocabulary term "interval" with SMARTBoard. The teacher accessed an interactive piano on the SMARTBoard and indicated the location of C, C#, D, D#, and E. The notes were audible as the teacher touched the keys. One of the students asked "can I go first" before the teacher had explained the vocabulary term. The teacher instructed the student to remain patient until the lesson was completed. The teacher then stated that "an interval is the distance between notes, and moving from C to D or D to E is an example of an interval of a 2nd. Moving from C to E is an example of an interval of a 3rd." The notes were audible as the teacher demonstrated the term. The students were invited to come to the SMARTBoard and demonstrate the location of an interval of a 2nd on the interactive keyboard. The anxious student demonstrated first, followed by the remaining members of the class. Students came to the SMARTBoard individually, one after the other, and demonstrated an interval using the same example given by the teacher. All students asked for "another turn" with the SMARTBoard. The students were only allowed to participate once. For the purpose of this study, students were given two response options that would be considered correct. The first option was "the distance between notes." The other option was "moving from C to D or D to E is an interval of a 2nd." The students responded with 100% accuracy on the exit ticket *(Figure 4.7)*.

Figure 4.7. Exit ticket responses for the definition of the term *interval* after one class using SMARTBoard preceded by one class using traditional instructional methods, reflecting 100% accuracy.

Students were next introduced to the vocabulary term "major scale," initially with SMARTBoard. Six of the students asked to "be first." The teacher continued with the lesson, revealed an interactive piano keyboard on the SMARTBoard, and indicated the location of C, D, E, F, G, A, B, and C on the keyboard. The notes were audible as the teacher touched the keys. The teacher then stated that "a major scale is a series of half steps and whole steps in this order: whole, whole, half, whole, whole, whole, half." The teacher touched each key and demonstrated a major scale, whole steps, and half steps. The notes were audible during the demonstration. Students were invited to come to the SMARTBoard and demonstrate the location of a major scale on the interactive keyboard. The student who responded inaccurately on the previous day demonstrated first. He responded accurately during this demonstration. Each student thereafter accurately demonstrated a scale on the keyboard individually and returned to their seat until the completion of the exercise. All students participated and asked for another opportunity with the SMARTBoard. For the purpose of this study, students were given two response options that would be considered correct. The first option was "whole steps and half steps in a special order." The other option was "whole, whole, half, whole, whole, whole, half." All students responded accurately on the exit ticket *(Figure 4.8)*.

Figure 4.8. Exit ticket responses for the definition of the term *major scale* after one class using SMARTBoard, reflecting 100% accuracy.

On the final day of the study, the teacher taught the students the vocabulary term "major scale" using traditional instructional methods. The teacher placed an 18 x 6 inch card stock piano keyboard on the chalkboard tray and indicated the location of C, D, E, F, G, A, B, and C on the keyboard. The teacher touched the keys and indicated each note's location. The teacher then stated that "a major scale is a series of half steps and whole steps in this order: whole, whole, half, whole, whole, whole, half." The teacher touched each key and demonstrated a major scale, whole steps, and half steps. Students were invited to come up to the chalkboard and demonstrate the location of a major scale on the paper keyboard. No one volunteered to "go first." However, all students approached the keyboard and accurately identified a major scale. Upon completion of the demonstration each student returned to his or her seat and waited for the conclusion of the exercise. For the purpose of this study, students were given two response options that would be considered correct. The first option was "whole steps and half steps in a special order." The other option was "whole, whole, half, whole, whole, whole, half." All students responded accurately on the exit ticket for the day *Figure 4.9)*.

Figure 4.9. Exit ticket responses for the definition of the term *major scale* after one class using traditional instructional methods preceded by one class using SMARTBoard, reflecting 100% accuracy.

When traditional instructional methods were employed to initially introduce vocabulary terms, the students consistently scored with 0% accuracy on the exit ticket *(Figure 4.10).*
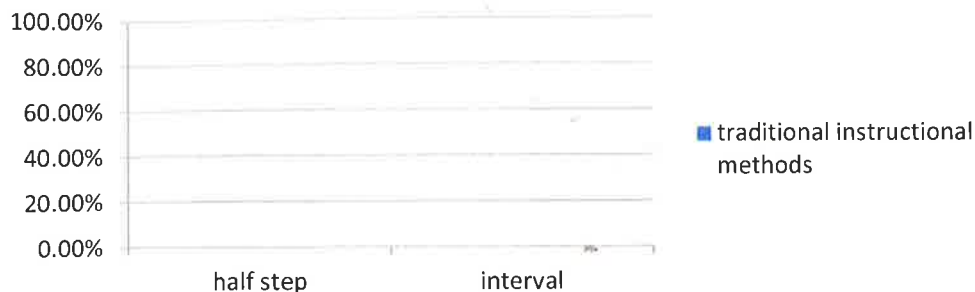

Figure 4.10. Accurate exit ticket responses to terms first introduced using traditional instructional methods.

On days during which students were instructed with traditional methods on vocabulary terms that were taught on the preceding day with SMARTBoard, they responded with a high degree of accuracy to the exit ticket question for that day *(Figure 4.11).*
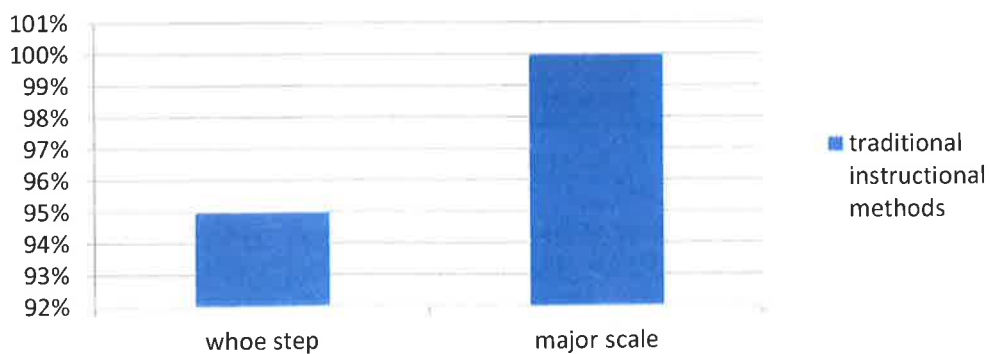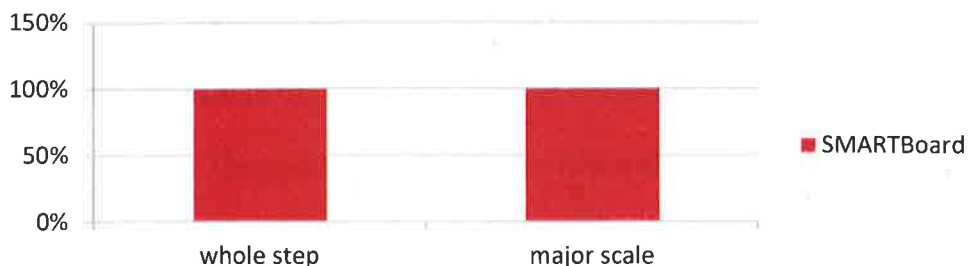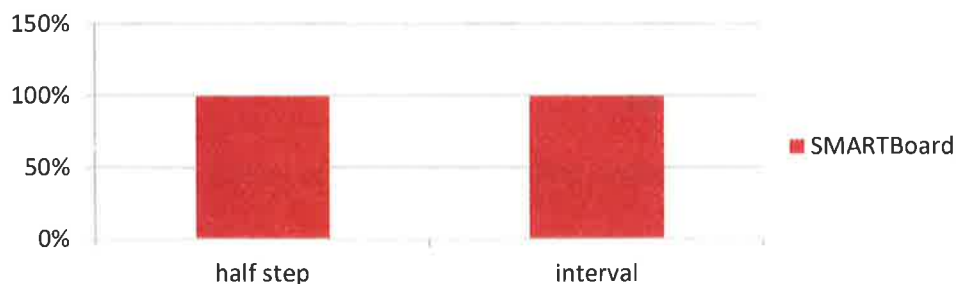

Figure 4.11. Accurate exit ticket responses to terms retaught using traditional instructional methods following initial introduction with SMARTBoard on preceding day.

On days, however, during which SMARTBoard was used to introduce vocabulary terms, the students consistently scored high on exit ticket responses after the introductory class (*Figure 4.12*).

Figure 4.12. Accurate exit ticket responses to terms first introduced using SMARTBoard.

When the researcher presented the same terms the following day with traditional methods, preceded by SMARTBoard instruction on the previous day, students responded with a high degree of accuracy on exit tickets indicating that they maintained their understanding of the terms (*Figure 4.13*).

*Figure 4.13.* Accurate exit ticket responses to terms retaught using traditional instructional methods following initial introduction with SMARTBoard on preceding day.

The action research study indicated that the order in which SMARTBoard was utilized with regard to instruction of any given unfamiliar vocabulary term in music was irrelevant. Vocabulary terms taught first with SMARTBoard generated high scores on

exit tickets. The results also revealed students scored high on exit tickets when taught with SMARTBoard on a subsequent day after the initial introduction of a new and unfamiliar vocabulary term with traditional instructional methods.

Students were given a follow-up online survey (Appendix E). The information gathered could be relevant to the request for SMARTBoard in vocal music classes throughout the county. The information suggested that a disparity existed between student test scores with SMARTBoard and with traditional instructional methods. Further studies are needed to make an accurate determination. In the follow-up online survey, students expressed that the instruction of new vocabulary terms in music with the use of SMARTBoard was simpler, was more fun, helped them remember longer, and was more preferable than instruction with traditional instructional methods (*Figure 14.4*).
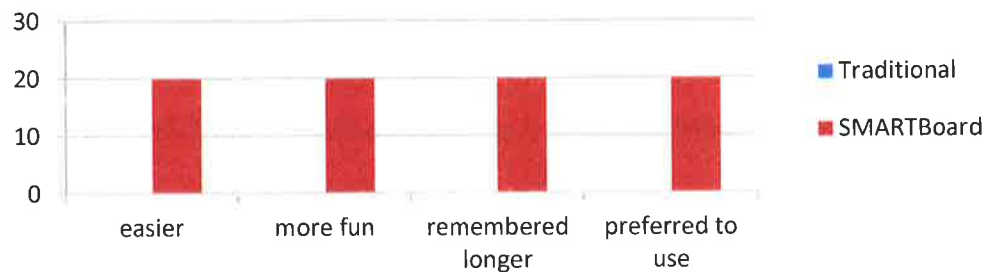
Figure 4.14. Follow-up survey of the study regarding preference of learning mechanism.

The novelty of the equipment provided interest for the students and maintained the attention of the class members, and student and teacher interaction was heightened. Students participated more enthusiastically when taught with the SMARTBoard and were actively engaged through the entire lesson. When instructional delivery occurred with traditional methods, students demonstrated a lack of interest and responded with less proficiency with vocabulary terms (*Figure 4.15*).
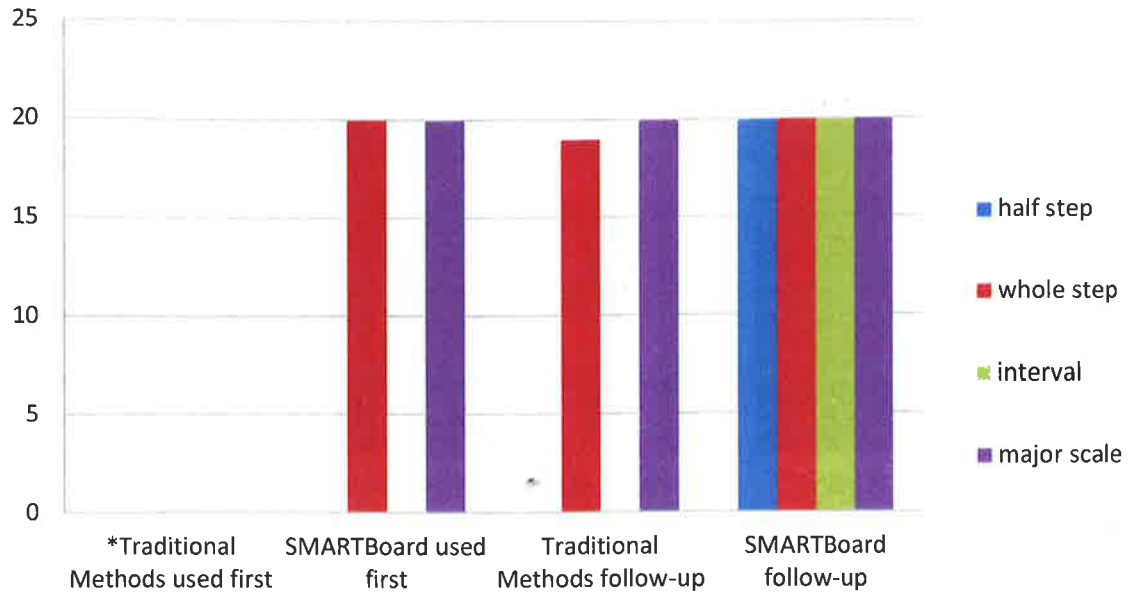
Figure 4.15. Number of students who responded correctly on exit tickets for specified modalities and methodology.

*note that half step and interval were taught first with traditional instructional methods

As noted previously, students were eager to demonstrate newly acquired knowledge when the SMARTBoard was used for instruction. The lesson material was displayed in a new and interesting manner with SMARTBoard, and students appeared motivated to learn. The motion and sound associated with the SMARTBoard appeared to capture the attention of the students for the duration of the lessons. The teacher experienced success with classroom management. SMARTBoard created an atmosphere that was favorable for learning for the students. Students responded with a high degree of accuracy on exit tickets when SMARTBoard was used, and students retained the information (*Figure 4.16).*
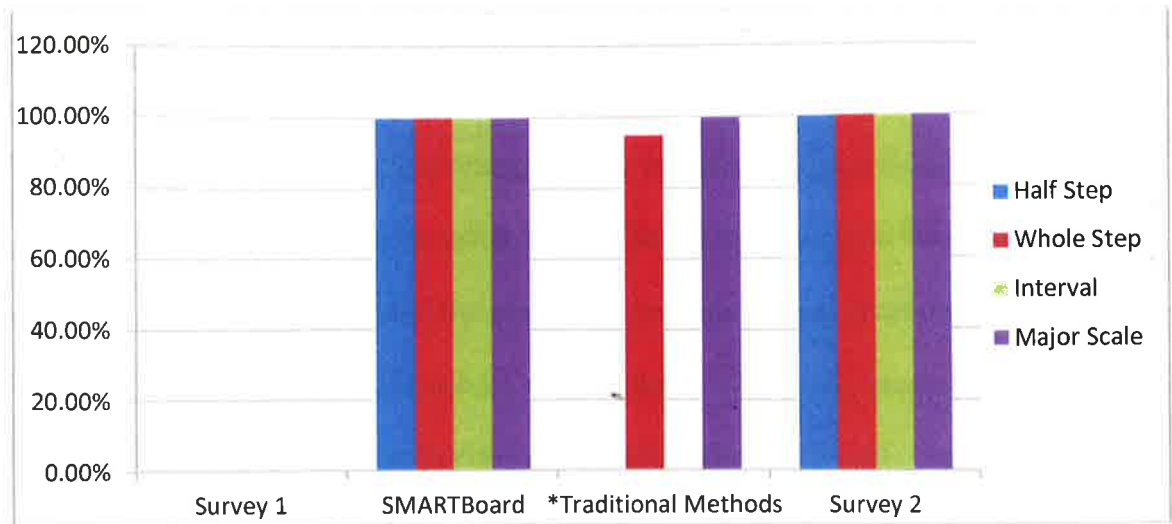
Figure 4.16. Percentage of students self-reporting understanding of vocabulary terms during specified periods of the study.

*Days on which accurate responses were given using traditional methods were preceded by initial instruction with SMARTBoard.

Chapter 5

Conclusion

The purpose of the action research study was to investigate the level of success of learning music vocabulary terms using SMARTBoard technology in the vocal music classroom. Students involved in the study were beginning level vocal music students enrolled in high school vocal music for the first time. The action research study began on the first day with traditional instructional methods. When the teacher used traditional instructional methods to teach new vocabulary terms, students consistently self-reported low understanding on exit ticket responses. When the teacher taught the same information on the following day with SMARTBoard, students consistently self-reported high understanding on exit tickets. This was an expected outcome since the students were exposed to the term on the previous day. The teacher presented a lesson with a new term on the third day with SMARTBoard, and students consistently self-reported high understanding on exit tickets. When the teacher taught the same information the following day with traditional instructional methods, the students maintained high scores on exit ticket responses. Students scored higher on self-reported music vocabulary tests when the teacher delivered instruction using SMARTBoard. As reflected by the post-survey responses at the conclusion of the study, students stated that SMARTBoard was "easier and more fun" to use. The post-survey also reflected that students remembered the information longer and preferred SMARTBoard instruction over traditional methods of instruction. Regardless of whether the teacher taught first with SMARTBoard or traditional instructional methods, students self-reported higher scores after instruction with SMARTBoard.

The research study was beneficial in that the researcher visualized the impact the SMARTBoard had on the level of enthusiasm students experienced with the device. Student enthusiasm was the most immediate observable benefit of SMARTBoard. Other benefits observed included measurable comprehension, based on exit ticket responses, constructive interaction, cooperative learning, and peer-coaching. The students verbally indicated a desire to continue with SMARTBoard for instruction of vocabulary terms. Students appeared more engaged and anxious to participate, and students were more verbally responsive. The information provided on the exit tickets validated the benefit of including SMARTBoard instruction in the classroom. The results were consistent with other studies in that the SMARTBoard, used as an instruction tool, increased motivation, student engagement, and aided the learning process (Langdon-Pollock).

SMARTBoard engaged the student's attention and, during instruction, appealed to the learning styles of the visual and tactile learner. SMARTBoard effectively integrated the whiteboard, overhead projector, and computer. When the teacher used only a single computer for instruction, it often obstructed the teacher's view of the students because of the computer's location in the room. SMARTBoard allowed for an unobstructed view of the students and allowed the teacher to monitor the classroom more effectively.

By learning new vocabulary terms and responding accurately to exit tickets, the students were able to demonstrate two levels of Bloom's taxonomy, knowledge and understanding. In music performance, one utilizes application, synthesis, and evaluation, demonstrating critical thinking skills. Students learn more effectively by actively participating in the learning process. During this study, the teacher observed the benefit of students' active engagement in the learning process. Students profited from

cooperative learning, and students encouraged each other to participate in the SMARTBoard activities. Students demonstrated a propensity for learning vocabulary terms when visual examples were provided in conjunction with the explanation. The teacher recognized the cross-curriculum instructional advantage and encouraged the utilization of the device in the classrooms of colleagues. As a member of the Assessment of Student Work (ASW) review board for the State of North Carolina, the teacher had input as to the selection of effective modalities that the state promoted for use by other educators. The state encourages and promotes the incorporation and utilization of SMARTBoard technology in the classroom. As reported by the students and teacher, SMARTBoard enhanced learning, simplified the delivery of instruction, and increased the amount of instructional information retained by the students.

This study may have been skewed by the teacher's enthusiasm for the SMARTBoard which may have influenced the level of enthusiasm demonstrated by the students. Prior to the initiation of the study, the teacher hypothesized that the SMARTBoard would provide a new and interesting method of learning music vocabulary terms. With this pre-conceived notion, the teacher may have inadvertently demonstrated more interest and excitement when presenting information using the SMARTBoard. By doing so, the students may have responded to the lesson by modeling the behavior of the teacher.

Investigation regarding the students' predisposition to learning in other subject areas with the SMARTBoard could have provided necessary information and insight. Random sampling could have provided a more accurate reflection of the population of beginning vocal music students. Additionally, more vocabulary terms could be included

in follow-up studies. Besides the unfamiliar terms, vocabulary terms developmentally appropriate for novice ensemble students could have been introduced during instruction.

During this study, the teacher collected information without establishing a control group prior to the beginning of the study and was unable to conduct the study for a sufficient period of time. Completing this study in a brief, pre-established time period limited the amount of possible participants and data collection opportunities, but this short timeline was necessitated by outside factors. The overall research design may have been ineffective and may have reflected inadequacies in sampling, and the research population was very small and limited to one class of students with one teacher. The students had no opportunity for demonstration or application of the vocabulary terms during the study since the lessons occurred during the last five minutes of the day. Information was provided by the teacher, and the students had little opportunity to synthesize the terms. Future studies related to learning music vocabulary could reflect a higher degree of accuracy by utilizing performance based research designs.

The investigator should have identified the resources necessary for the duration of the study before the study began. Adequate financial resources and ample time should have been appropriated for the design phase, the collection of data, data analyzing, and document preparation. By anticipating the flaws of the study prior to beginning the process of investigation, the investigator may have eliminated some of the problems associated with the study. Although the results cannot be generalized or replicated, the results of the study support the use of SMARTBoard technology in other educational settings. However, further investigation is this area is needed in order to determine the effectiveness of SMARTBoard for effectiveness of instructional delivery in the vocal

music classroom. A study, for example, involving a larger population sample may reflect a broader basis for comparison. A study including more teachers and students, particularly the inclusion of students from other levels of vocal music classes such as honors level and advanced placement courses, would provide a broader database for comparison.   In addition, longitudinal studies may provide more information. Extending the study for a longer duration to include subsequent semesters would also provide more information for comparison studies and may have eliminated the novelty of the SMARTBoard.

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Appendix A

February 3, 2014

Mr. David Culbreth, Principal
Pine Forest High School
525 Andrews Road
Fayetteville, NC 28311

Re: Classroom research

Dear Mr. Culbreth,

I am currently working on my Masters of Music Education degree at the University of North Carolina at Pembroke. As partial satisfaction for my degree, I have developed a research project to be conducted during a 2 week period of time in my fourth period class. Participants will complete an on-line survey related to the new concepts to be presented to develop a baseline of knowledge. Students that choose not to participate will not be penalized, and students choosing to participate will receive no compensation, tangible or otherwise. Students will be introduced to new concepts in class using the smart board on one day, and the following day the concept will be presented without the use of the smart board. On the next day, a NEW concept will be introduced without the smart board on day 1, and then the same concept will be presented the next with the smart board. This rotation of using and not using the smart board will continue for 8 days. 4 new concepts will be introduced, 1 for each 2-day block. Students will complete an "exit ticket" each day that reflects knowledge acquired for the day. A follow-up survey will be made available for students to complete reflecting the ease or difficulty of learning using the smart board. The study is being conducted to determine the effectiveness of learning musical concepts with the use of the smart board. If this project meets with your approval, please sign below granting permission for the study. Thank you in advance for your consideration.

Sincerely,

Denise M. Hall

I have reviewed Mrs. Hall's proposed research project and grant permission for the study.

_____   _____

David Culbreth, Pine Forest High School Principal   DATE

Appendix B

Informed Consent to Participate in Research
Information to consider before taking part in research that has no
more than minimal risk.

Title of Research Study: The Success of Learning Music Concepts Using
the

Smartboard

Principal Investigator: Denise M. Hall

Institution/Department or Division: School of Music

Address: Pembroke, North Carolina

Telephone #: (910) 521-6000

Study Sponsor/Funding Source: n/a

Researchers at the University of North Carolina at Pembroke study problems in society, health problems, environmental problems, behavior problems and the human condition. Our goal is to try to find ways to improve the lives of you, your child, and others. To do this, we need the help of volunteers who are willing to take part in research.

Why is this research being done?

The purpose of this research is to examine the success of learning musical concepts using the smartboard. The decision to take part in this research is yours to make. By doing this research, we will attempt to learn whether or not the use of the technology tool known as the smartboard is helpful in learning musical concepts.

Why am I being invited to take part in this research?

Your child is being invited to take part in this research because he or she is a choir member in ninth grade intermediate vocal music. If your child volunteers to participate in this research, your child will be one of about 20 people to do so.

Are there reasons I should not take part in this research?

There are none.

What other choices do I have if I do not take part in this research?

Your child can choose not to participate.

Where is the research going to take place and how long will it last?

The research procedures will be conducted in the high school choir classroom at Pine Forest High School. Your child will need to come to their choir classroom during their normal allotted times during the school day.   The total amount of time your child will be asked to volunteer for this study is no more than twenty (40) minutes over the next 2 weeks.

What will I be asked to do?

Your child is being asked to do the following: answer all four questions of a survey that deal with topics of learning with technology and vocal music concepts. This survey is strictly for research purposes only.

What possible harms or discomforts might I experience if I take part in the research?

It has been determined that the risks associated with this research are no more than what your child would experience in everyday life.

What are the possible benefits I may experience from taking part in this research?

We do not know if your child will receive any benefits by taking part in this study. This research might help us learn more about the success of technology in the classroom. There may be no personal benefit from your child's participation but the information gained by doing this research may help others in the future.

Will I be paid for taking part in this research?

We will not pay you or your child for the time you volunteer while being in this study.

What will it cost me to take part in this research?

 It will not cost you or your child any money to be part of the research.

Who will know that I took part in this research and learn personal information about me?

To do this research, UNCP and the people and organizations listed below may know that your child took part in this research and may see information about your child that is normally kept private. With your permission, these people may use your child's private information to do this research:

•   Any agency of the federal, state, or local government that regulates human research. This includes the Department of Health and Human Services (DHHS), the North Carolina Department of Health, and the Office for Human Research, The University & Medical Center Institutional Review Board (UMCIRB) and its staff, who have responsibility for overseeing your welfare during this research, and other UNCP staff who oversee this research.

How will you keep the information you collect about me secure? How long will you keep it?

The Principal Investigator will be the only one who views this anonymous information. The data will be kept for a period no longer than four (4) months.

What if I decide I do not want to continue in this research?

If your child decides that he no longer wants to be in this research after it has already started, he may stop at any time. Your child will not be penalized or criticized for stopping and your child will not lose any benefits your child should normally receive.

Who should I contact if I have questions?

The person conducting this study will be available to answer any questions concerning this research, now or in the future. You may contact the Principal Investigator at (910) 488-2384 or (910) 531-3439.

Is there anything else I should know?

No.

I have decided I want to take part in this research. What should I do now?

The person obtaining informed consent will ask you to read the following and if you agree, you should sign this form:

- I have read (or had read to me) all of the above information.
- I have had an opportunity to ask questions about things in this research I did not understand and have received satisfactory answers.
- I know that my child can stop taking part in this study at any time.
- By signing this informed consent form, I am not giving up any of my child's rights.
- I have been given a copy of this consent document, and it is mine to keep.

Parent Name (PRINT)   Signature   Date

Person Obtaining Informed Consent: I have conducted the initial informed consent process. I have orally reviewed the contents of the consent document with the person who has signed above, and answered all of the person's questions about the research.

Person Obtaining Consent (PRINT)   Signature   Date

Appendix C

Assent of Minor Participant

Project Title: The Success of Learning Music Concepts Using Smartboard Technology
Investigator: Sherry Denise Williams-Hall,
Investigator Phone Number: (910) 488-2384; (910) 531-3439

I am doing a research study. A research study is a special way to find out about something. I am trying to find out the best method of learning music concepts.

If you decide that you want to be in this study, I will ask you to do several things. You will go to the edmodo site and take a survey about a few music concepts. You will have 8 lessons in class that teach concepts in music. Some of the lessons will use the smartboard and some will not use the smartboard. You will complete another survey at the end of the lessons telling which method made it easier for you to learn the concepts.

Not everyone who is in this study will benefit. A benefit means that something good happens to you. I don't know if you will benefit. But I hope to learn something that will help other people someday.

When I am done with the study, I will write a report about what I found out. I won't use your name in the report.

You don't have to be in this study. It's up to you. If you say okay now, but you want to stop later, that's okay too. All you have to do is tell me.

If you want to be in the study, please sign your name.

I, _____, want to be in this research study.
(print your name here)

_____   _____
(sign your name here)   (date)

Appendix D

Survey #1

What is you understanding of the following terms *as they relate to music*? Define the term.

1. Half step:

Never heard The term	No understanding	understand somewhat	understand	fully understand

Define:_____

2. Whole step:

Never heard The term	No understanding	understand somewhat	understand	fully understand

Define:_____

3. Interval:

Never heard The term	No understanding	understand somewhat	understand	fully understand

Define:_____

4. Major Scale:

Never heard The term	No understanding	understand somewhat	understand	fully understand

Define:_____

Appendix E

Survey #2

What is you understanding of the following terms *as they relate to music*? Define the term.

1. Half step:

| Never heard | No | understand | understand | fully |
| The term | understanding | somewhat | | understand |

Define:_____

2. Whole step:

| Never heard | No | understand | understand | fully |
| The term | understanding | somewhat | | understand |

Define:_____

3. Interval:

| Never heard | No | understand | understand | fully |
| The term | understanding | somewhat | | understand |

Define:_____

4. Major Scale:

| Never heard | No | understand | understand | fully |
| The term | understanding | somewhat | | understand |

Define:_____

Appendix F

SMARTBoard Research Follow-up Survey

1. Which method of learning musical vocabulary was easier? (Circle your response)

    Instruction with the use of   Instruction without the use of
    Smartboard Technology   Smartboard Technology

2. Which method of learning musical vocabulary was more fun? (Circle your response)

    Instruction with the use of   Instruction without the use of
    Smartboard Technology   Smartboard Technology

3. Which method of learning musical concepts helped you remember the information for a longer period of time? (Circle your response)

    Instruction with the use of   Instruction without the use of
    Smartboard Technology   Smartboard Technology

4. Which method of learning musical concepts would you rather use on a daily basis in class? (Circle your response)

    Instruction with the use of   Instruction without the use of
    Smartboard Technology   Smartboard Technology

Appendix G

NCDPI Teacher Evaluation Criteria

"analyze student learning: think systematically and critically about learning in their classroom: why learning happens and what can be done to improve student achievement; collect and analyze student performance data to improve effectiveness; use a variety of instructional methods; choose methods and materials as they strive to eliminate achievement gaps; employ a wide range of techniques using information and communication technology, learning styles, and differentiated instruction; teachers integrate and utilize technology in their instruction; know appropriate use of technology to maximize student learning; help students use technology to learn content, think critically, solve problems, discern reliability, use information, communicate, innovate and collaborate."