THE EFFECT OF PRIMARY INSTRUMENT INSTRUCTION ON MUSIC ACQUISITION

by

Joshua Floyd

_____

A Thesis Submitted to the faculty of the

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

In Partial Fulfillment of the Requirements

For the Degree of

MASTER OF ARTS

In the Graduate College

THE UNIVERSITY OF ARIZONA

2019

THE UNIVERSITY OF ARIZONA
GRADUATE COLLEGE

As members of the Master's Committee, we certify that we have read the thesis prepared by *Joshua Floyd* titled *The Effect of Primary Instrument Instruction on Music Acquisition* and recommend that it be accepted as fulfilling the dissertation requirement for the Master's Degree.

Eric D. Smith   Date: 5/6/19

Monica Erbacher   Date: 5/6/19

Ronald Marx   Date: 05/06/2019

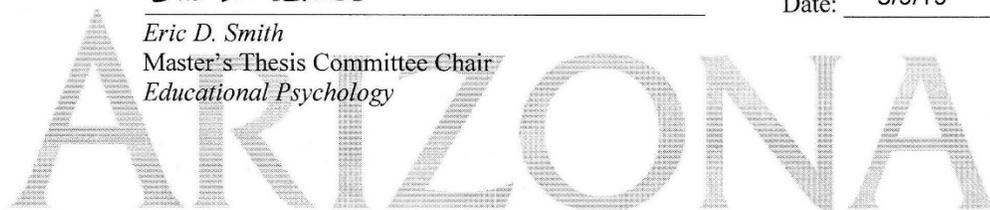Dawn Corso   Date: 05/06/2019

Final approval and acceptance of this thesis is contingent upon the candidate's submission of the final copies of the thesis to the Graduate College.

I hereby certify that I have read this thesis prepared under my direction and recommend that it be accepted as fulfilling the Master's requirement.

Eric D. Smith   Date: 5/9/19
Master's Thesis Committee Chair
Educational Psychology

Table of Contents

List of Figures/Tables

Abstract

The current thesis sought to investigate possible effects Recorder Karate had on students' music achievement and attitudes towards music. Recorder Karate is a curriculum intended for third grade students and uses a recorder as the focus of its instruction. The purpose of Recorder Karate is to intervene on students' motivation to engage and remain in music. Existing literature suggests a relationship between attitudes and music achievement may affect motivation. Discovering curricula targeting amotivation and apathy towards music is an important step for music educators. A total of 87 third grade students were recruited from a southwestern public elementary school. Recorder Karate resulted in statistically significant improvement on music achievement and attitudes towards music. The effects that change in attitude towards music had on predicted change in music achievement was accounted for, but did not demonstrate statistical significance. Students' teachers explained unique variance in two change scores: change in accuracy (proportion of notes correct) and change in total attempted notes. Taken together, findings indicate Recorder Karate works to improve students' motivation by focusing on their music achievement and attitudes towards music. Further research elucidating the relationship between music achievement and attitudes towards music is needed.

Keywords: motivation, attitudes, music achievement, recorder, Recorder Karate

The Effect of Primary Instrument Instruction on Music Acquisition

Overview of the Problem

Music, as defined by anyone, is a way communicative means in which individuals may express and perceive feelings across cultures. Broadly, it is the art of combining vocal or instrumental sounds to produce beauty of form, harmony, and expression of emotion (Allen, 1992). Musical instruction plays a dynamic role in the development of youth's identities. It serves to define how children view themselves and those around them through a myriad of social constructs such as race, gender, class, and language (Edgar, 2017). Furthermore, the individual's preferences and attitudes concerning music provide a clear delineation for the position of the self and perception of the self in relation to others, therefore assisting with the maintenance of positive social identities (Edgar, 2017). It is imperative to note that "...an attitude is used to make sense of the world and to help the organism operate on its environment… [and] is held in perhaps the most important attitude object -- the self" (Pratkanis & Greenwald, 1989, p. 249). The formation of these social identities contribute largely to the development of a more profound musical self-concept (Edgar, 2017). The connection between self-concept and self-esteem is driven by experiences gained and time spent within these music classes, as evidenced by the maintenance of other self-schemas such as self-esteem (Rickard et al., 2012). Retention in music programs, therefore, is a markedly important topic in music education.

Students' desire to continue taking music classes is a product of how autonomous instruction in those classes are (Rickard et al., 2012). However, activities made available to students in general music classes range from singing, to instrument playing, to movement games and more - which may provide a lack of structure. In a study conducted with kindergarten students, 29% of participants expressed singing to be a favorable activity, whereas 16.5%

expressed playing an instrument to be favorable (Denac, 2007). As organized music classes in grades beyond elementary school are largely ensemble based, the low percentage of students indicating a preference for playing an instrument poses a threat to retention.

To promote the formation of a positive attitude towards music, children must be able to participate in activities that are favorable (Rickard et al., 2012). Denac (2007) claimed that instrument playing is not a favorable activity for students, thus developing an enjoyable curriculum based on instrument playing is a necessary step for music educators to take. These beginning instrumental ensembles appear to provide students with a less than ideal experience according to their own self reports. In a recent study, extended involvement in a beginning instrumental ensemble was *negatively* correlated with self-esteem (Scalas et al., 2017). This poses a problem when developing and instituting an instructional plan with student growth in mind. Music educators have also noted amotivation to be one of their largest stressors in teaching (Evans, 2015). Little research has been conducted on its manifestation inside of music classrooms, however.

Music educators must address three potential goals in their instructional planning. First, as students are beginning instruction more focused on performance, educators should motivate them to reach their potential. Secondly, students' experiences in music classes must positively affect their attitudes towards music. These two goals demand the implementation of a curriculum that is self-regulated, autonomous, motivational, and focused on the continued growth of the students.

Recorder Karate, a curriculum focused on instrument playing, attempts to address the aforementioned goals by presenting students with the opportunity to regulate their own learning through autonomous instruction. Achievement in Recorder Karate is distinguished through the

display of a belt, denoting current level. Observation of the students' current levels in regards to either their own personal goals or the levels of other students allows for students to easily see their progress and how to improve on it. Furthermore, the pieces that students perform to increase in belt level are self-selected, which provides a sense of autonomy over their own learning. The music made available at each belt level is scaffolded with the main goal of music literacy and music achievement in mind. Music literacy is operationally defined as the students ability to decode written staff notation and turn it into sound (McPherson, 2015). Music achievement is defined as the students ability to recognize and identify written notation. Student success through both their ability to read music as well as perform music is carefully monitored and managed with the instructor. As Recorder Karate focuses on elements of self-regulated learning and autonomous instruction, it is plausible to hypothesize the curriculum may positively impact students' motivation within music classes.

In the following sections, I elaborate on students' motivation to learn music and intent to continue their musical instruction. First, I review the benefits for continued involvement in music and discuss factors that can either facilitate or hinder persistence in music, specifically (a) motivation; (b) integration; (c) attitudes towards music; and (d) curriculum design. Last, I discuss the purpose and overview of the current thesis.

<div align="center">

Benefits of Music Participation

</div>

Continued Involvement in Music

Boosting retention rates in music programs is an enduring goal maintained by educators. Constructing an understanding of how best to achieve this aim is an important subject to examine. First, the development of positive relationships between peers and teachers lead to higher retention rates (Jacobi, 2012). Also, higher reports of musical self-concept, or the

individual's perception of their own musical abilities, relate to higher retention rates in middle and high school programs (Demorest, Kelley, & Pfordresher, 2017; Green & Hale, 2011; Klinedinst, 1990). Students who value music and demonstrate a positive attitude towards it were more likely to continue participation in band (Stewart, 2005). Socioeconomic factors such as resources made available (e.g., private lessons and support from home) were related to students' reported attitudes towards music (Stewart, 2005). Private lessons, therefore, become a place in which this value can be fostered. Children who play such instruments at a young age often do not take lessons, however (McPherson, 2015). Beyond experience in music, another predictor may come from expressed musical literacy, or how well a student may read notation. After 7 months of instruction in band, the largest predictor for student achievement, or their performance on their instrument, involved music reading skills (Klinedinst, 1990). Music reading skills, in this case, refers to the individual's ability to recognize and identify relevant pitches on a musical staff.

Continued involvement in music can positively impact the development of self-efficacy, self-concept, and value (Ng, 2017; Renwick & Reeves, 2012; Hewitt, 2005). Maintaining an intent to continue musical instruction also positively affects student support systems (Martinez, et al., 2016). Involvement in extracurricular activities gives students an opportunity to develop relationships with peers while also affecting their feelings of school connectedness (Martinez et al., 2016). Effects of music on social development may only be observable after 12 months (Rickard et al., 2012). Rickard et al. (2012) notes that prior research conducted under shorter durations had little to no effect on global self-esteem, suggesting that effects of this instruction are largely dependent on the amount of time students are involved - communicating the need to boost retention rates.

Determining points of influence on student retention in music classes demands a multifaceted approach considering the person, environment, and motivation. Student-teacher and peer relationships are strong predictors of retention rates (Jacobi, 2012). Students' self-schemas contribute largely to retention with a focus on self-concept, self-efficacy, and value (Demorest, Kelley, & Pfordresher, 2017; Green & Hale, 2011; Klinedinst, 1990, Sichivista, 2004; Sichivista, 2007). Furthermore, music literacy may also be considered a strong predictor of retention rates (Klinedinst, 1990). Continued involvement in music aids in improving self-concept, self-efficacy, and value (Hewitt, 2005; Ng, 2017; Renwick & Reeves, 2012). Motivating forces in students' intent to continue musical instruction can, therefore, be identified through an inspection of the interaction between person, environment, and behavior.

Facilitators vs. Hinderers of Participating and Continuing in Music

Motivation

Music intrinsically acts to meet the needs of the individual (Hallam, 2008). Musicians derive personal fulfillment from making music as well as the social benefits it provides, but these motives change over time (Hallam, 2008). Evans (2015) emphasizes more focus needs to be placed on developing motivational strategies which promote healthy cognitive and social growth among students involved in music. One of music teachers' greatest stressors is student motivation (Calderella et al., 2017). One suggestion for remedying amotivation calls for an inspection of the classroom environment, the relationship between students and teachers, and students' opportunities for autonomy (Evans, 2015).

Environmental factors that generally maintain and enhance intrinsic motivation include the provision of optimal challenges, opportunities for self-direction, acknowledgment of feelings, and positive feedback (Renwick & Reeve, 2012). Allowing students to pick which activities they

choose to engage in and how they participate in music classes fosters an autonomous learning environment. Examples of autonomy in practice in an organized ensemble might be the allowance of choice in selected performance pieces or rate of progression. While students are learning an instrument, providing them with a choice in songs they learn piques their interest and intrinsic motivation (Renwick & Reeve, 2012). Difference in teachers' motivational styles, or more specifically the learning environment and personality of the teacher, may also be largely responsible in fostering intrinsic motivation within students (Renwick & Reeve, 2012).

In organized sports, coaches who created autonomous learning environments, when compared to those who completely controlled the learning environment, increased student athletes' intrinsic motivation (Renwick & Reeve, 2012). This effect may also be observed in other informal settings. One such motivation intervention examined the effect of placing an autonomous based instruction in practice during physical education (Gonzalez-Cutre et al., 2018): Students learned through the instructor's communication of task goals adapted to students' current skill levels. Promoting positive feedback and allowing students to choose the activities positively impacted their motivation (Gonzalez-Cutre et al., 2018). Another intervention on motivation in physical education classrooms allowed students to choose partners during activities, with the provision of choice associated with students' higher levels of perceived autonomy in PE (Chang et al., 2016). Motivational outcomes demonstrated within these situations can easily be transferred to fit a music classroom.

A more focused approach to intervening on student's motivation in music may positively affect their attitudes towards music. Students who continued in musical instruction had more confidence, enjoyed learning music, and valued their musical instruction (Ng, 2017). This reinforces the importance of self-concept, self-esteem, and retention rates in music classes.

Disaffection, therefore, is a construct of large import: Students who do not value music are not retained in music classes (Ng, 2017). The extent to which learners value what they are doing predicts engagement across many different facets of musical practice (Hallam, 2008). An individual's value of an activity is also a strong predictor of their intent to continue their engagement in that activity (Renwick & Reeves, 2012). Children's valuing for music as an activity or subject depends on whether they find it important, interesting, useful, and worth the costs of involvement (McPherson, 2015). These self-schemas actively work to predict the students' intent to continue musical instruction.

In contrast to results of Ng's (2010) study, another such project conducted to determine possible predictors in students' music motivation in China found opposing results. Self-confidence was negatively impacted as students grew older (Xie & Leung, 2011). Xie and Leung (2011) suggest that is attributable to the heavy focus on choral music in secondary schools. The assumption that the focus on choral music effects motivation reflects results illustrated in Denac's (2007) work on determining favorable music activities within kindergarten classrooms, as singing was only rated favorable by 29% of participants. In Mexico, these results were also observed: Interest in music was negatively correlated to students' ages (Gonzalez-Moreno, 2010). An analysis consisting of primary, middle, and high schools determined that students in primary school held the highest interest in music, whereas students in high school demonstrated the lowest interest in music (Gonzalez-Moreno, 2010). This was attributed to the limited access to formal music education within high schools in Mexico. However, private schools that incorporated arts integration in their curriculum evidenced positive effects on students' motivation to continue musical instruction (Gonzalez-Moreno, 2010). This suggests that access to structured music instruction in school plays a large role in predicting retention rates. These

results are also replicable within American school systems (Hallam, 2008), proving to be a large scale issue cross-culturally.

Examining other motivating forces on student retention in music suggests the structure found in music classes at the primary level is negatively associated with students' interest towards the subject (Hentschke, 2010). This effect on students' music learning is attributed to their experiences in general music classes, demanding the examination of classroom environment, curriculum, and teaching styles. Results from Hentschke's (2010) research reinforces the claim that students' value of a subject is a strong predictor of their intent to continue engaging in that subject (Renwick & Reeves, 2012).

Self-esteem and self-confidence have also been identified as key predictors for students' choice in pursuing music classes, musical achievement, and their engagement in music classes (Yoon, 2017). These constructs also provide students with a sense of importance and direction with regard to their experiences in music (Yoon, 2017). Self-esteem and self-confidence in music mediates projected direction, and demonstrates an observable impact on intent to continue musical instruction as well as the level of activity towards students' musical achievement (Yoon, 2017). Furthermore, older students have higher ratings of self-esteem and self-confidence, enabling age to be a viable predictor in these musical self-schemas (Yoon, 2017). This difference between younger and older students may be attributable to their experience and retention in music classes.

Important factors in determining motivating forces on students' expressed intent to continue in music classes are explained by social and cognitive experiences. Firstly, music achievement, or more specifically musical literacy, is a strong predictor of student retention (Klinedinst, 1990). Self-efficacy by way of student performance (Hewitt, 2015; Renwick &

Reeves, 2012) also predicts student retention (Yoon, 2017). Other self-schemas that work to predict retention in music classes include self-concept and value (Ng, 2017; Renwick & Reeves, 2012). Beyond performance and attitude towards music, students' motivation is also affected by their environment. Autonomous instructional models may provide students with control over which songs they learn and demonstrate a positive effect on their intent to continue in music classes (Chang, et al., 2016; Evans, 2015; Gonzalez-Cutre, et al., 2018; Renwick & Reeve, 2012). The interaction between the student, behavior, and environment they are in, therefore illuminate driving forces in motivation.

Integration Inside and Outside of the Music Classroom

Meaningful relationships with their teachers and peers may be afforded to students through their participation in music classes. Positive relationships among students result in greater commitment to group goals, personal responsibility, willingness to take on difficult tasks, motivation to persevere, openness, and dedication to others' success (Jacobi, 2012). Learning a new instrument, however, can be a daunting task for amateur musicians: Students participating in a beginning level instrumental ensemble reported lower levels of musical self-concept compared to students involved in choral ensembles (Scalas et al., 2017). In this case, musical self-concept related specifically to students' perceptions of their abilities, and their abilities to improve with practice (Sichivista, 2004).

In order to combat the formation of a negative musical self-concept, there must be an inspection on the effectiveness of instructional practices that occur within music classrooms. Promoting student success is a key factor towards their development and growth within these classrooms. In a survey given to students in third, fourth, and fifth grade, participants' social integration in class was a dependable predictor of their musical self-concept, academic

integration in class, and value of music (Sichivista, 2004). In this case, social integration was operationalized as students' satisfaction with the informal interactions between peers and the teacher as well as group work. Academic integration was operationalized as their satisfaction with the demands of music class, their own performance in class, and the opportunities for learning they receive in class. Therefore, social integration drives the development of attitude towards music as it relates the student's self-concept and value.

The interaction between performance and attitude is determinedly influential on motivation, but is also important to note that the learning environment also impacts attitude. (Jacobi, 2012; Scalas et al., 2017; Sichivista, 2004). Specifically, the relationships students develop in class (Jacobi, 2012), and their integration within the class (Sichivista, 2004) affects the development of their self-schemas.

Attitude Towards Music

Attitude predicts motivation and engagement in an activity (Pratkanis & Greenwald, 1989). Attitude, therefore, is impactful on students' music learning. Furthermore, the stronger the attitude an individual has, the stronger of a predictor that attitude becomes on behavior (Pratkanis & Greenwald, 1989). Attitude, connects to the development of self-esteem, maintenance of self-concept, and expression of value (Pratkanis & Greenwald, 1989). Self-efficacy is a reliable predictor of students' quality of performance (Hewitt, 2015; Renwick & Reeves, 2012). Students' value judgment and self-efficacy predicts music achievement (Renwick & Reeves, 2012). Attitude is also linked to an individual's motivation disposition and is used to assign a subject (in this case, music) to a favorable class, such as cherishing, or to an unfavorable class such as avoiding (Pratkanis & Greenwald, 1989). This assignment of the object, music in

this case, calls for an examination on the students' intent to continue musical instruction in relationship to their attitude.

Attitude is a concept of large importance when determining students' intentions to continue musical instruction, and relates to the individuals' self-efficacy, self-concept, and value. Investigating how these self-schemas interact is an important step to make. In a survey conducted on college musicians, participants' value explained 42% of variance in musical intention (Sichivista, 2007). Intention was operationally defined as the "student's intentions to participate in formal and informal musical activities in the future" (p. 59) and value was defined as student's "perceptions of musical experiences as ones that provide opportunities for personal growth, enjoyment, and learning, as well as confirm positive characteristics of themselves" (p. 59). Furthermore, academic and social integration explained 42% of variance found in value (Sichivista, 2007). In order to determine potential points of influence on students' intentions to continue musical instruction, it is important to draw connections between their integration in the classroom and their value of music.

Taken together, Sichivista's (2007) work illuminates potential areas of influence in adult musician's musical identities. Moreover, later work dovetails nicely with earlier work (Sichivista, 2004). In that earlier work, musical self-concept explained 35% of the variance in academic integration and 17% of the variance in social integration (Sichivista, 2004). In an older audience, musical self-concept and academic integration explained 57% of the variance found in social integration (Sichivista, 2007). Thus, musical self-concept influences whether students value music *and* plan to continue their musical instruction.

The effect that attitude has on performance and retention is further reinforced by Sichivista (2004; 2007). Attitude towards a subject is distinguished as the individual's self-

efficacy, self-concept, and value (Pratkanis & Greenwald, 1989). Self-concept, self-efficacy, and value interact with one another (Sichivista, 2004; Sichivista 2007). Assisting in the development of a positive musical self-concept and self-efficacy should be at the forefront of an educator's goals for their students. Presenting students with activities and instruction that boosts their music achievement plays a role in the development of positive self-schemas and retention in musical programs (Hewitt, 2015; Renwick & Reeves, 2012; Yoon, 2017). However, assisting in this process is challenging, as student apathy and a lack of motivation are some of teachers' greatest stressors in the classroom (Calderella et al., 2017). It is imperative to intervene on this issue so that students may continue to grow and develop in their music classes.

Teacher Differences

Teacher quality is dependent on the experience gained while teaching. In a study on middle and high school teachers' productivity, teachers' experience inside of the classroom predicted student achievement (Harris & Sass, 2011). Beyond student achievement, teacher quality affects student learning and engagement in class (Gershenhenson, 2016). In a sample composed of 13,391 unique teachers and 27,943 unique students, teacher quality influenced student achievement on math and reading tests (Gershenhenson, 2016). Furthermore, teachers have a large influence on student absences (Gershenhenson, 2016). Beyond teacher quality, the relationships developed between teacher and student may influence student engagement and achievement. In a meta-analysis of 99 studies involving teacher-student relationships, positive relationships were correlated with higher student engagement ($r = .39$) and higher student achievement ($r = .16$; Roorda et al., 2011).

Teachers may hold a large influence over students' desires to continue musical instruction. Teacher's personality, values, communication of goals, and inclusion of important

figures in students' lives are important factors in determining intent to continue in music (other teachers, parents; Renwick & Reeves, 2012). A teacher's persona also predicts students' educational outcomes and development within music classes (Renwick & Reeves, 2012). It is also imperative that activities are established so that they are accessible and rewarding to students. For instance, concerts, field trips, and competitions are all viewed as motivating factors for students' musical practice (Albert, 2007). Primary music classrooms can replicate these motivating factors by allowing students to take playing tests with their teachers and holding regular performances.

Another source of influence on students' learning comes from teachers' abilities to closely follow the protocols and structure of the curriculum (Little et al., 2013). In this project, 30 fourth grade teachers and 40 fifth grade teachers were tasked with implementing a program centered on health and demonstrated that teachers' reports of program fidelity and observations of implementation fidelity were associated with program outcomes. As the current thesis is dependent on teachers' abilities to deliver this curriculum, it is imperative to take into consideration that any effects may be attributable to teacher differences.

Curriculum Design

The current thesis used an instructional model based off of Recorder Karate, a curriculum that rewards student achievement in the music classroom through a hierarchical belt system (Philipak, 2002). The target audience for this instruction was third grade students involved in general music programs with access to a recorder, a small woodwind instrument. The main focus of Recorder Karate was to hone students' musical prowess and appreciation. For the purpose of this intervention, the following design principles were examined: (1) musical literacy, and (2) attitudes towards music. Musical literacy is operationalized as the students' abilities to identify,

understand, and apply their knowledge of written notation. Attitude towards music is operationalized as the students' enjoyment and intent to continue in formalized musical instruction.

In Recorder Karate, students received 40 minutes of instruction on recorders twice a week throughout the entirety of the academic school year. Students worked to learn how to play pieces of music that are scaffolded in difficulty using a belt system to symbolize skill level. In order to progress in level, students must test a total of four songs with the instructor. Students are required to practice and test with the music teacher, echoing instructional elements found in private lessons and potentially fostering a deeper value of music (Stewart, 2005). The instruction was delivered as a whole class through their rehearsal of music; in small groups during student-led activities; and individually while testing to progress in belt level. Receiving this individualized instruction allowed the instructor to monitor student success, thereby ensuring students gained the desired musical literacy and technical skills needed to play an instrument.

Throughout the Recorder Karate curriculum, students learned and mastered various pieces of music on their recorders, both as a class and individually. Pieces of music being used in instruction must keep students interested and engaged (Koops, 2018), as meaningful tasks that include student interests are more likely to boost motivation and promote a learning orientation than tasks that are not meaningful (Green & Hale, 2011). The learning, in this case, becomes community-driven and personally motivating, ultimately influencing students' appreciation of music. In this model, teacher enthusiasm is important; modeling and providing positive reinforcement are very effective and individual or group contingencies are useful (Calderella et al., 2017). Setting up an environment in which students are able to monitor their success in relation to classroom and personal goals while working together contributes largely to students'

musical growth, both cognitive and social. This environment requires an understanding of human learning processes evidenced by repertoire, or pieces of music, that is scaffolded by difficulty (Tobias, Campbell, & Greco, 2015). Learning outcomes must be organized for student success (Hallam, 2001). Furthermore, positive relationships among students result in greater commitment to group goals, personal responsibility, willingness to take on difficult tasks, motivation to persevere, openness, and dedication to others success (Jacobi, 2012).

Purpose and Overview of the Current Project

The purpose of this project is to further contribute to research focused on students' attitudes, music achievement, and the relationship between the two using Recorder Karate as its vehicle. Further inspection of music achievement and attitude towards music will illuminate the effectiveness of this curriculum implementation. Understanding and providing theoretical backing to instructional models already established is an imperative step for music psychologists to undertake. The field of music education would appear to rely heavily on practice rather than theory. Developing a theoretical understanding is needed for the progress, growth, and continued responsiveness of music education.

Beyond developing a deeper understanding on effective instructional devices inside the music classroom, this project aimed to relationships between students' music achievement, attitude towards music, and teachers' influence over these two constructs. The connection between performance on attitude and vice versa and whether or not predictions can be made regarding either is of some import.

In this project, students underwent one academic semester of Recorder Karate instruction. The current thesis sought to evaluate the effectiveness of Recorder Karate through the use of a pretest-posttest design. Furthermore, the effects that teachers held over student achievement and

attitudes towards music was accounted for following the end of the project's data collection period.

Research Questions

The current thesis sought to address the following research questions:

1. Does an 18-week curriculum using recorders in the music classroom enhance students' music acquisition?

2. Does an 18-week curriculum using recorders in the music classroom positively affect students' attitudes towards music?

3. Will students with greater positive change scores on an attitude towards music measure evidence greater positive change scores on a note identification exercise?

4. Will students' teachers affect change in students' note identification and attitudes towards music?

Hypotheses

The current project advanced the following hypotheses:

1. Participants involved in Recorder Karate will demonstrate higher scores on a notation recognition posttest than on a pretest.

2. Participants involved in recorder karate will demonstrate a higher posttest score than pretest score on a music affinity survey.

3. Change in scores on the notation recognition assessment will predict change in attitude towards music.

   a. Higher growth from pretest to posttest in both number and percentage correct on the notation recognition test will result in higher growth in attitude towards music.

4. Participants' teachers will be related to change in participants' notation scores and attitudes toward music.

Method

Participants

Participants were third grade students (45 males, 42 females) enrolled at three public elementary schools within a city located in the Southwestern United States. Third graders were recruited, as all schools within this school district begin recorder instruction in the third grade. Parents/guardians received consent forms at the beginning of the academic year and returned them during the third full week of school. Participants provided assent prior to taking part in the study. Music teachers (3 females) at these select schools were included in the study alongside their students.

Instruments

Notation Ninja assessed participants' musical notation knowledge (see Appendix A). In this assessment, participants attempt to identify as many notes on a staff as possible with a total of 60 items within the allotted 2 minute limit. Participants' total number of items correct, total number of items attempted, and percentage correct were all calculated.

A music survey measured participants' attitude towards music through 15, three-point Likert items (see Appendix B). This survey was adapted from a previous instrument developed by Sichivista (2004). In order to be appropriate for a third-grade student, items assessing previous experience in music classes were removed, and the language was changed using Fleischmann's reading scale. The adapted survey consisted of 5 subscales: (1) participants' perceptions of their own abilities (e.g., "I can sing/play songs I like."); (2) participants' personal experiences in their music classes (e.g., "I am doing well in music classes."); (3) participant's

social experiences in their music classes (e.g., "I like singing with others."); (4) participant's value of music (e.g., "I like learning about music."); and (5) participants' intentions to continue musical instruction (e.g., "I want to be in music classes in the future"). Participants responded to each item using a three-point Likert scale (-1 = *No*; 0 = *I don't know*; 1 = *Yes*). Scores on the Likert scale were interpreted as a sum score rather than through the subscales created in the original survey due to the modified nature of the instrument.

Procedure

Recruitment for implementation of this curriculum occurred during the summer preceding the 2018-2019 academic year through a mix of prior relationships with teachers maintained by the principal investigator and communications held with the school district's supervisor of the fine arts department. The principal investigator met with each teacher before the semester began to discuss the structure and goals of Recorder Karate. Teachers communicated any adaptations or changes needed. Families of third grade students were given consent forms that were collected during the second full week of school.

Prior to receiving Recorder Karate instruction, teachers administered pretests of the Notation Ninja assessment and the attitude toward music survey to participants. Participants had two minutes to complete the Notation Ninja assessment. Participants had five minutes to complete the attitude toward music survey.

Participants received primary instrument instruction on recorder twice a week for 40 minutes a session over the course of one semester.[1] In these classes, participants performed songs as a whole class, in small groups, and individually. Songs ranged in difficulty and included a large selection of pieces to provide participants with some choice as to what they were learning. Participants advanced through the hierarchical belt system of the Recorder Karate throughout the
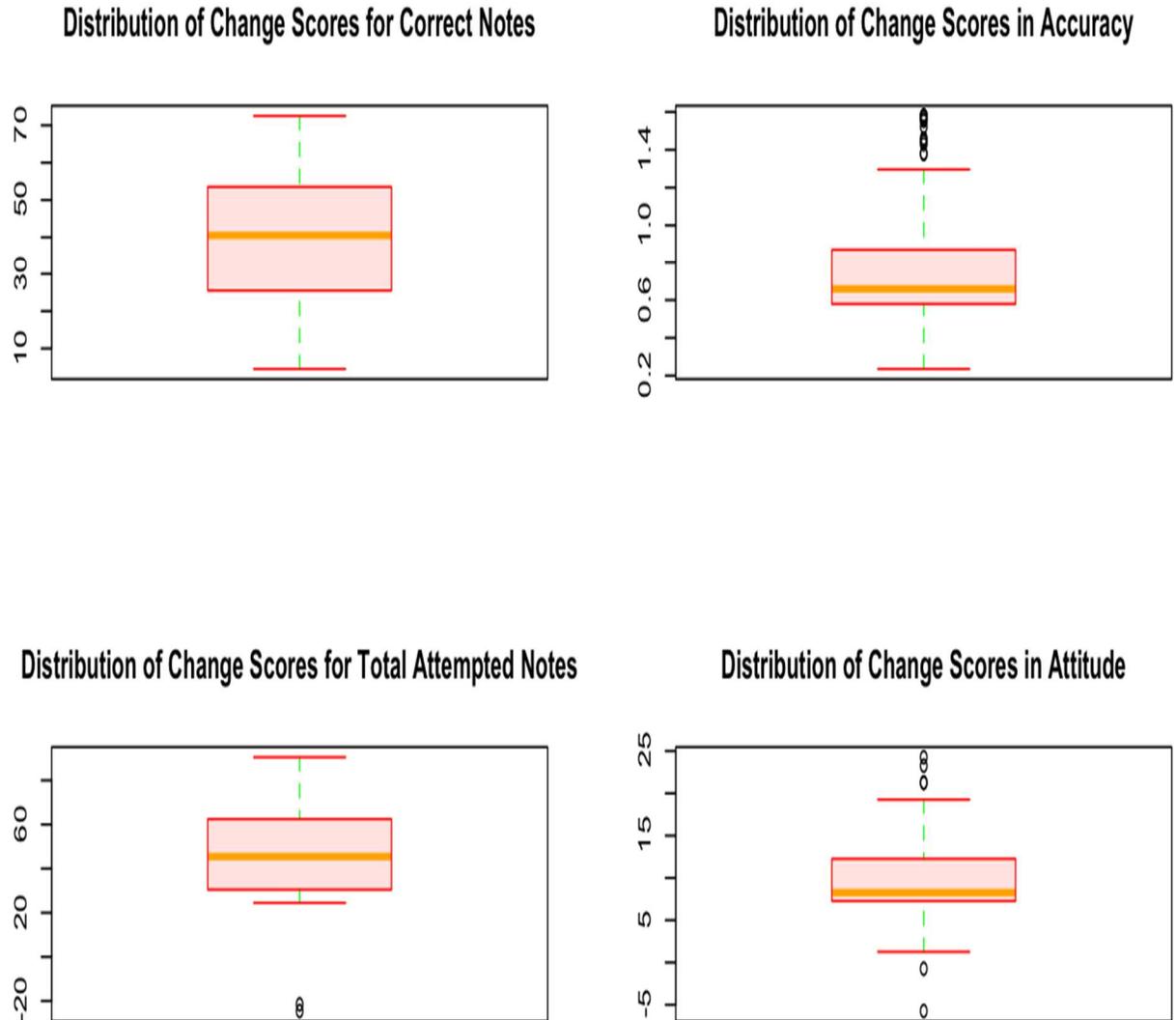
semester. Belt level dictated the array of songs participants chose from to rehearse. In order to progress in level, participants had to successfully test a total of four songs with their music teacher. At the end of the semester, students completed the Notation Ninja and attitude toward music posttests.

Results

Research Question 1

A paired samples t test was conducted to test whether students' music acquisition changed (i.e., improved) after the 18-week Recorder Karate curriculum. Paired samples t tests were conducted on three separate attributes of the Notation Ninja test: (1) total amount of correct notes; (2) accuracy of correct notes (i.e., number correct/number attempted); and (3) total attempted.

Results on total amount of correct notes demonstrated a statistically significant change (calculated as posttest - pretest; $M = 26.21$, $SD = 17.28$) across occasions of pretest ($M = 12.52$, $SD = 11.61$) and posttest ($M = 38.72$, $SD = 18.57$), $t = 20.905$, $p < .001$. On average, students scored 26.21 more notes at posttest. Change scores on total correct notes maintained acceptable skew (.05) and kurtosis (-1.12). A boxplot of change scores indicated there were no outliers (see Figure 1).

Distribution of Change Scores for Correct Notes

Distribution of Change Scores in Accuracy

Distribution of Change Scores for Total Attempted Notes

Distribution of Change Scores in Attitude

Figure 1. Boxplots on change scores for: change scores for correct notes (top left) ; change scores in accuracy (top right) ; change scores for total attempted notes (bottom left); and change scores for attitude (bottom right)

Results on accuracy of correct notes demonstrated a statistically significant change (calculated as posttest - pretest; *M* = .22, *SD* = .35) across occasions of pretest (*M* = .58, *SD* = .41) and posttest (*M* = .80, *SD* = .28), *t* = 21.35, *p* <.001. On average, students scored 22% higher

on accuracy of correct notes on the Notation Ninja. Change scores on accuracy of correct notes maintained acceptable skew (1.05) and kurtosis (-.08). A boxplot of change scores on accuracy correct was conducted and indicated there were several outliers (see Figure 1). Further inspection revealed that these outliers did not have any substantial influence on the results of this test. There was no evidence that these outliers were from a population different from the sample.

Results on total attempted notes demonstrated a statistically significant change (calculated as posttest - pretest; $M = 17.71$, $SD = 20.51$) across occasions of pretest ($M = 30.46$, $SD = 21.49$) and posttest ($M = 48.17$, $SD = 16.01$), $t = 21.907$, $p < .001$. On average, students attempted 17.71 more notes on the Notation Ninja. Change scores on total attempted notes maintained acceptable skew (-.55) and kurtosis (-1.50). A boxplot of change scores on total attempted notes was conducted and indicated there were several outliers (see Figure 1). Further inspection revealed that these outliers did not have any substantial influence on the results of this test. There was no evidence that these outliers were from a population different from the sample.

Research Question 2

In order to check for reliability of the attitude survey, Cronbach's alpha reliability coefficient and Guttman's Lambda 2 were calculated. Cronbach's alpha was .83 on items in the survey. This alpha indicates a good internal consistency as it is greater than .80 (Gliem & Gliem, 2003). Internal consistency for a total score as measured by Guttman's Lambda 2 was .84.

A paired samples t test was conducted to test whether students' attitude towards music changed (i.e., improved) after the 18-week Recorder Karate curriculum. An analysis was conducted from pretest and posttest sum scores of the music survey.

Results on attitude sum scores demonstrated a statistically significant change (calculated as posttest - pretest; $M = 1.38$, $SD = 4.79$) across occasions of pretest ($M = 8.26$, $SD = 5.40$) and

posttest (M = 9.64, SD = 5.02), t = 18.792, p <.001. On average, students scored 1.38 points higher on their attitude survey. Change scores on total attempted notes maintained acceptable skew (-.47) and kurtosis (1.85). A boxplot of change scores on attitude was conducted and indicated there were several outliers (see Figure 1). Further inspection revealed that these outliers did not have any substantial influence on the results of this test. There was no evidence that these outliers were from a population different from the sample.

Research Question 3

      Model 1. A simple linear regression was conducted to examine whether change in Notation Ninja accuracy was predicted from two variables: (1) mean-centered pretest accuracy on Notation Ninja; and (2) mean-centered change in attitude toward music. The regression model produced $F(2, 84)$ = 51.69, p <.001 (see Table 1). Overall, the model explained a statistically significant amount of variance. The regression equation was the following:

      Predicted change in Notation Ninja accuracy scores = .804 - .627 (pretest) - .014 (change in attitude). On average, students who received a 0 on their pretest accuracy score and did not change in their attitude towards music had a change score of .804 (answered an additional 80% of items attempted correctly at posttest compared to pretest). Each unit increase in pretest accuracy scores, controlling for attitude towards music, predicted a decrease in accuracy change scores by .627. Each unit increase in attitude towards music change scores, controlling for pretest accuracy, predicted a decrease in accuracy change scores by .014. The standard error of estimate demonstrates that on average, accuracy change scores were .03 points away from the actual scores. Pretest accuracy scores accounted for 55.14% of the variance in accuracy change scores, demonstrating pretest scores were practically significant. Change in attitude toward music

accounted for .3% of variance in Notation Ninja accuracy change scores above and beyond all

other predictors, demonstrating that this predictor is not practically significant.

Table 1

Regression Model Predicting Notation Ninja Accuracy of Correct Notes Change Scores

Predictor	*B*	*SE*	*t*	*p*	95% CI	sr^2
Intercept	.804	.026	30.476	<.001	.751, .857	
Pretest Accuracy Scores	-.628	.062	-10.161	<.001	-.751, -.505	.551
Attitude Change Scores	-.015	.005	-.0748	.456	-.0146, .007	.003

Note. F(2, 84) = 51.69, *p* <.001, *SEE* = .03X, *R²* = .552

Change scores on accuracy of correct notes maintained acceptable skew (1.05) and

kurtosis (-.08). A plot indicated that this model has homoscedasticity. A scatterplot indicated

pretest accuracy scores and attitude change scores were linearly related to accuracy change

scores (see Figure 2). In order to check for multicollinearity, VIF was calculated and values were

within the acceptable range (Hair et al., 2010). Cook's Distance indicated there were no
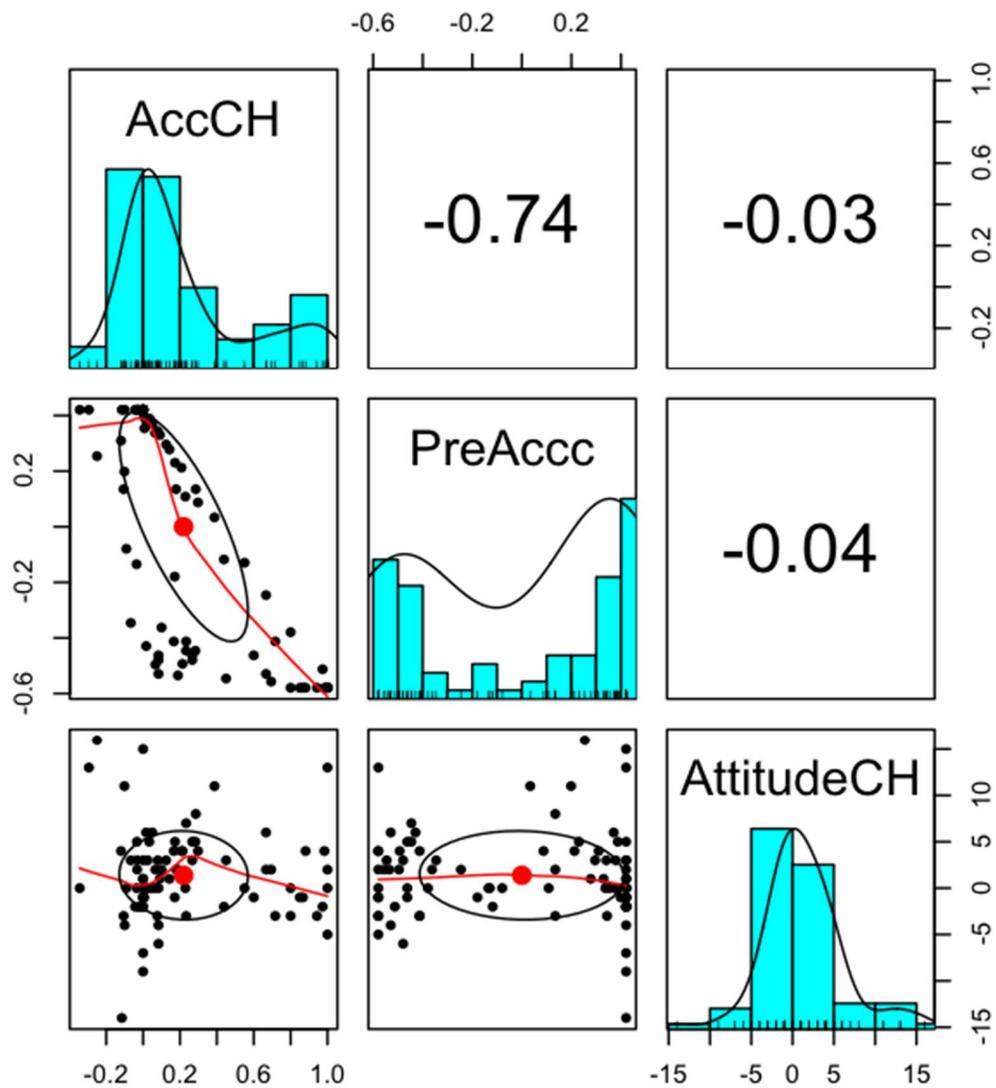
influential points (Cook, 1977; see Figure 3)

Figure 2. Scatter plot of accuracy of correct notes change scores to check for linear relationships.
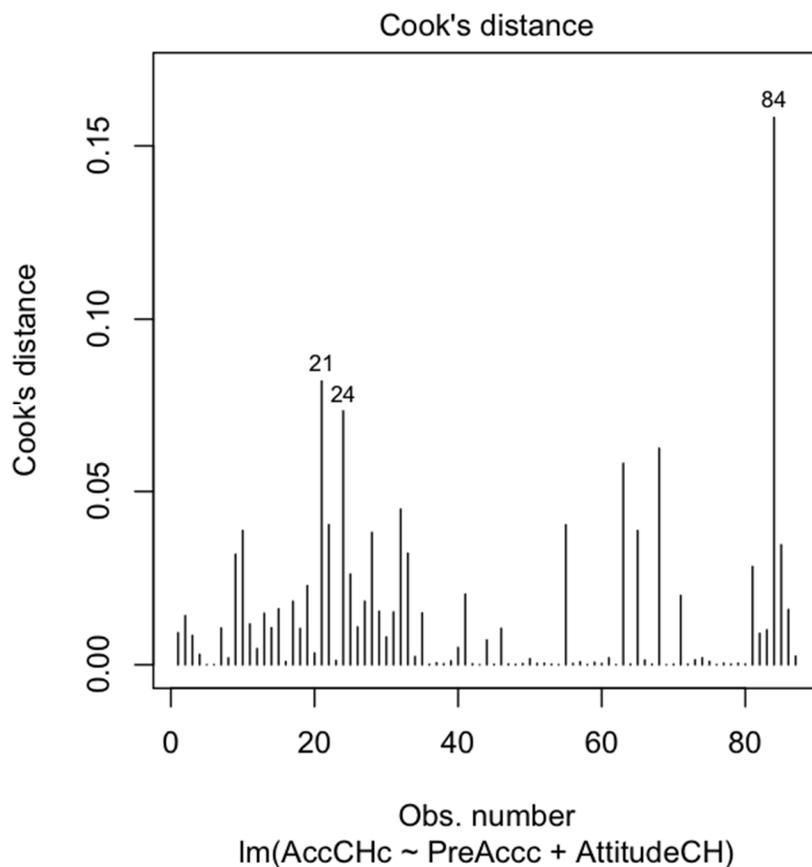
Figure 3. Cook's Distance for each student from change in accuracy of correct notes scores predicted by pretest accuracy scores and change in attitude

Model 2. A simple linear regression was conducted to predict change in Notation Ninja number attempted from the following predictors: (1) mean-centered pretest number attempted on Notation Ninja; and (2) mean-centered change in attitude toward music. The regression equation resulted in $F(2, 84) = 45.1$, $p < .001$ (see Table 2). The model explained a statistically significant amount of variance in change in number of items attempted. On average, students who received a 0 on pretest attempted notes score and a had a 0 on change in attitude towards music had a change score of 47.49 on notes attempted. Each unit increase in pretest total attempted notes scores, controlling for change in attitude towards music, predicted a change in accuracy scores of

- .672. Each unit increase in attitude towards music change scores, controlling for mean-centered pretest notes attempted, predicted an increase in accuracy change scores of .495. The standard error of estimate demonstrates that on average, total attempted notes change scores were 1.61 points away from the actual scores. Pretest total attempted notes scores accounted for 49.4% of the variance found in change scores, above and beyond change in attitude, demonstrating pretest scores were practically significant. Change in attitude accounted for 1.3% of variance found in Notation Ninja accuracy change scores above and beyond all other predictors, demonstrating that this predictor is not practically significant.

Table 2

Regression Model Predicting Notation Ninja Total Attempted Notes Change Scores

Predictor	*B*	*SE*	*t*	*p*	95% CI	*sr²*
Intercept	47.490	1.609	29.518	<.001	44.291, 50.690	
Pretest Total Attempted Notes Scores	-.672	.072	-9.278	<.001	-.816, -.528	.494
Attitude Change Scores	.495	.325	1.521	.132	-.152, 1.141	.013

Note. $F(2, 84) = 45.1$, $p <.001$, $SEE = 1.61$, $R^2 = .552$

Change scores on total attempted notes maintained acceptable skew (-.47) and kurtosis (1.85). A plot indicated this model has homoscedasticity. A scatterplot demonstrated pretest total attempted scores and attitude change scores were linearly related to total attempted change scores (see Figure 4). In order to check for multicollinearity, VIF was calculated and values were within the acceptable range (Hair et al., 2010). Cook's Distance was conducted and revealed no influential points (Cook, 1977; see Figure 5).
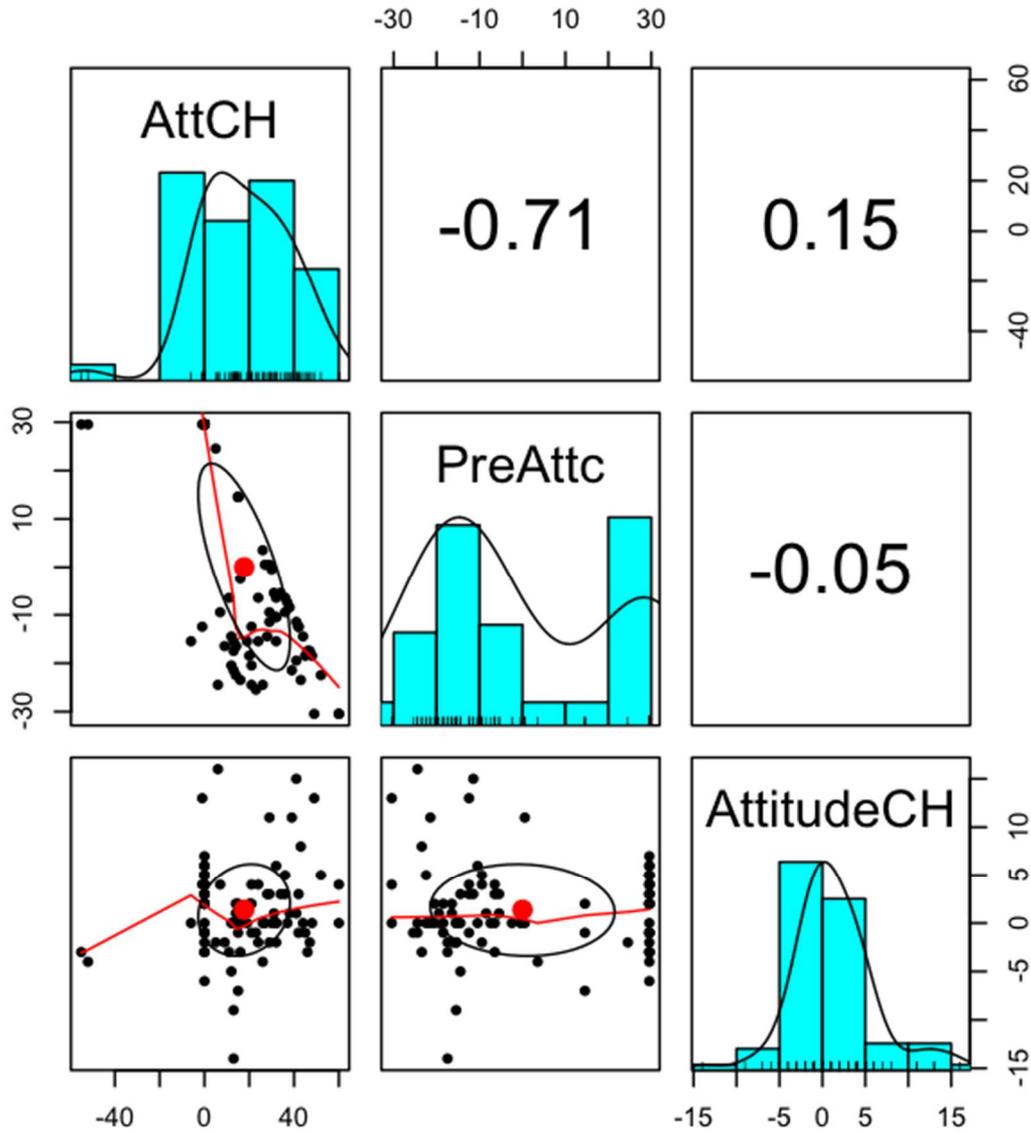
Figure 4. Scatter plot on change scores on total attempted notes predicted by pretest total

attempted notes scores and change in attitude, indicating relationships are linear.
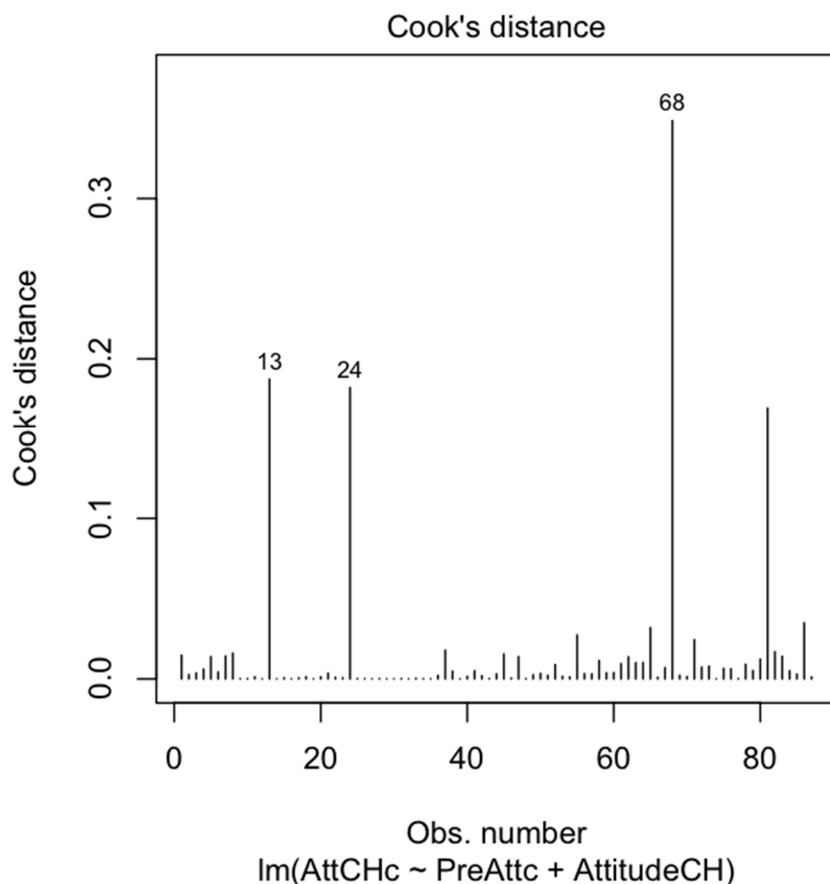
Figure 5. Cook's Distance on change in total attempted notes scores predicted by pretest total attempted notes scores and change in attitude indicating there are no influential points.

Research Question 4

Model 1. A stepwise linear regression was conducted to examine whether change in Notation Ninja accuracy was predicted from three variables: (1) mean-centered pretest accuracy on Notation Ninja; (2) change in attitude toward music; and (3) teacher as a nominal predictor. The first step included a model predicting accuracy of correct notes change scores from mean-centered pretest accuracy of correct notes scores and mean-centered attitude change scores. The second step added the effect of teacher to the previous model. A model comparison was conducted, indicating the variance in accuracy change scores uniquely explained by teacher was

statistically significant (see Table 3). Teacher 2 explained an additional 1.7% of variance in

change in Notation Ninja accuracy, demonstrating no practical significance. Teacher 3 explained

2.5% of variance in change in Notation Ninja accuracy, demonstrating no practical significance.

Table 3

Regression Model Predicting Notation Ninja Accuracy of Correct Notes Change Scores with the

Effect of Teacher

Predictor	*B*	*SE*	*t*	*p*	95% CI	*VIF*	*sr²*
Intercept	.443	.105	4.215	<.001	.234, .653		
Pretest Accuracy Scores	-.736	.066	-11.226	<.001	-.867, -.606	1.133	.592
Attitude Change Scores	-.007	.005	-1.437	.154	-.017, .003	1.018	.010
Teacher 2	-.196	.094	-2.083	.040	-.384, -.009	1.990	.017
Teacher 3	.198	.080	2.484	.015	.039, .357	1.784	.025

Note. $F_{(4, 82)} = 42.2$, $p < .001$, $R^2 = .657$

A plot indicated this model had homoscedasticity. A scatterplot indicated pretest

accuracy scores, attitude change scores, and teacher were linearly related to accuracy change

scores (see Figure 6). In order to check for multicollinearity, VIF values were calculated and

were within the acceptable range (Hair et al., 2010). Cook's Distance was conducted and

detected no influential points (Cook, 1977; see Figure 7).
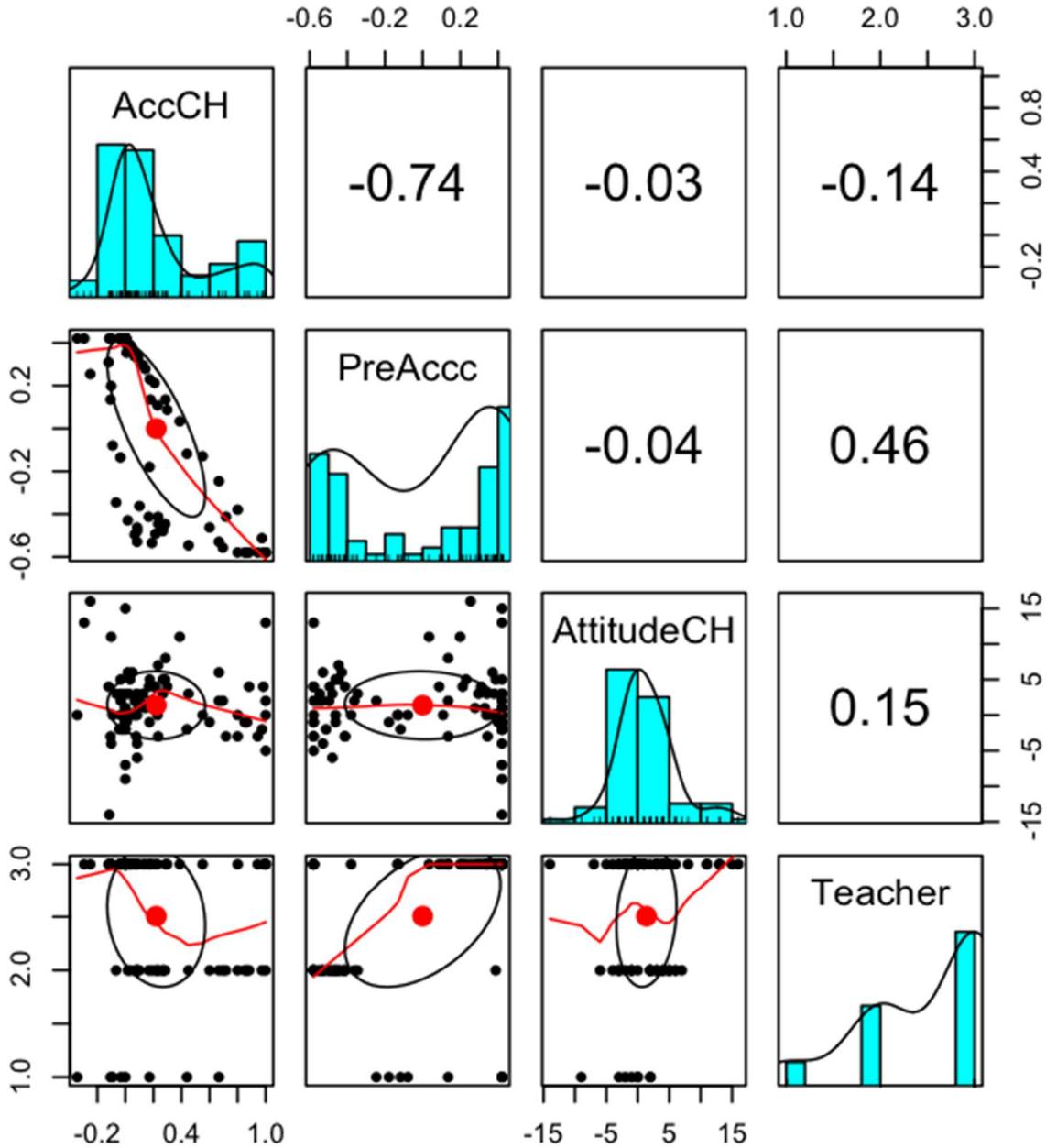
Figure 6. Scatter plot on change scores on accuracy of correct notes predicted by pretest accuracy of correct notes scores, change in attitude, and teacher, indicating relationships are linear.
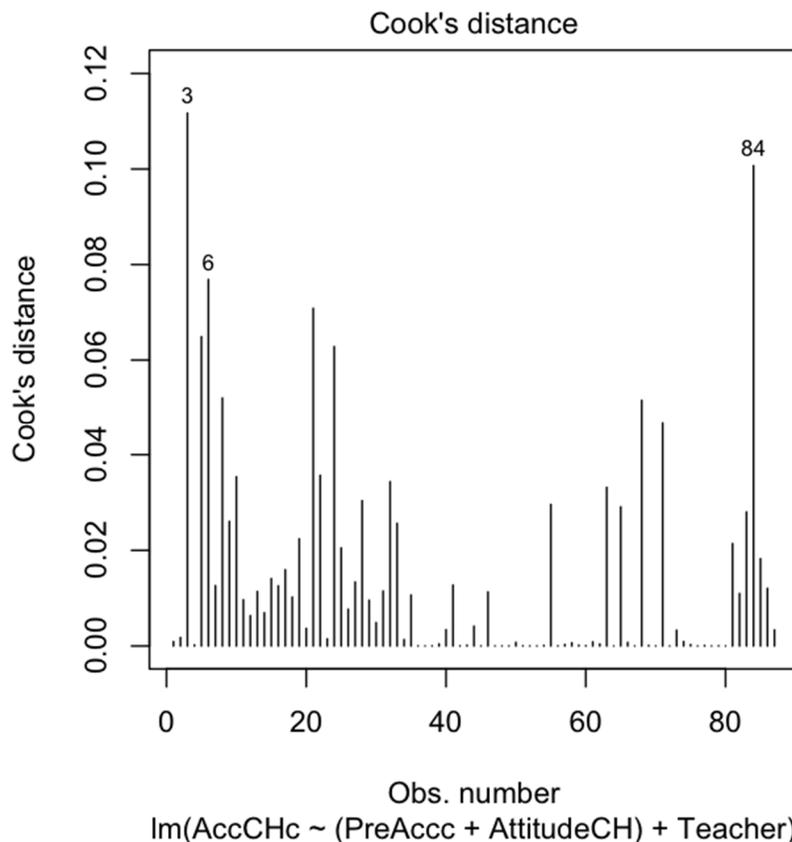
Figure 7. Cook's Distance on change in accuracy of correct notes predicted by pretest accuracy of correct notes scores, change in attitude, and teacher indicating there are no influential points.

Model 2. A stepwise linear regression was conducted to predict change in Notation Ninja number attempted from the following predictors: (1) mean-centered pretest number of attempted on Notation Ninja; (2) mean-centered change in attitude toward music; and (3) teacher as a nominal predictor. The first step included a model predicting total attempted notes change scores from pretest total attempted notes scores and attitude change scores. The second step added the effect of teacher to the previous model. A model comparison was conducted and determined that variance attributable to teacher was statistically significant (see Table 4). Teacher 2 uniquely explained an additional .9% of variance in change in Notation Ninja number attempted, demonstrating no practical significance. Teacher 3 uniquely explained an additional 1.1% of the variance in change in Notation Ninja number attempted, demonstrating no practical significance.

Table 4

Regression Model Predicting Notation Ninja Total Attempted Notes Change Scores with the

Effect of Teacher

Predictor	*B*	*SE*	*t*	*p*	95% CI	*VIF*	sr^2
Intercept	34.023	6.373	5.338	<.001	21.346, 46.699		
Pretest Total Attempted Notes Scores	-.612	.076	-8.052	<.001	-.763, -.461	1.074	.356
Attitude Change Scores	.398	.321	1.240	.219	-.241, 1.037	1.011	.008
Teacher 2	-4.444	11.049	-.402	.689	-26.417, 17.530	3.377	.009
Teacher 3	8.159	5.785	1.410	.162	-3.350, 19.668	1.875	.011

Note. $F(4, 82) = 24.91$, $p < .001$, $R^2 = .527$

A plot indicated this model had homoscedasticity. A scatterplot indicated pretest accuracy scores, attitude change scores, and teacher were linearly related to accuracy change scores (see Figure 5). In order to check for multicollinearity, VIF values were calculated and were within the acceptable range (Hair et al., 2010). Cook's Distance was conducted and detected no influential points (Cook, 1977; see Figure 9).
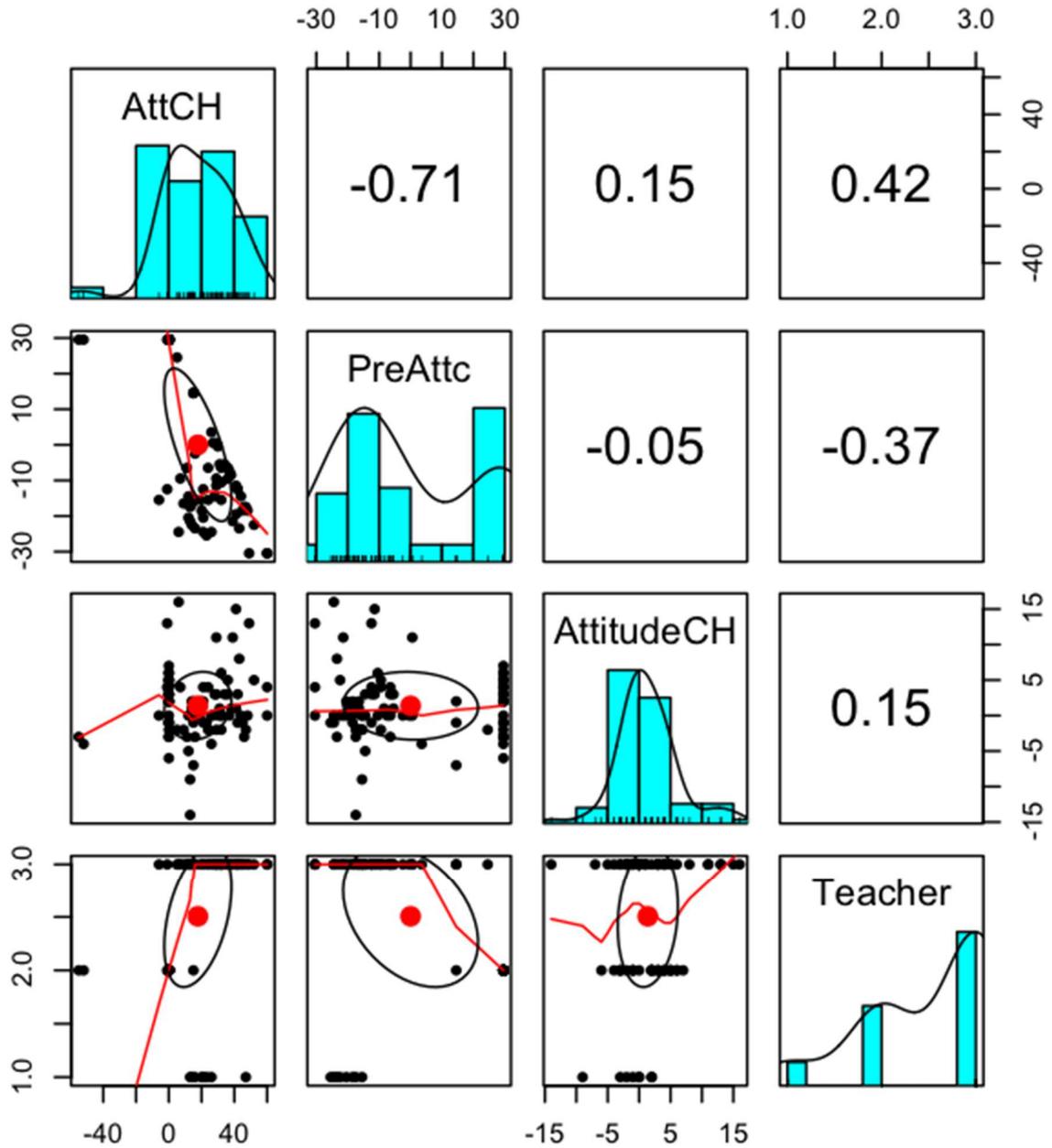
Figure 8. Scatter plot of change scores on total attempted notes predicted by pretest total

attempted notes scores, change in attitude, and teacher, indicating relationships were linear
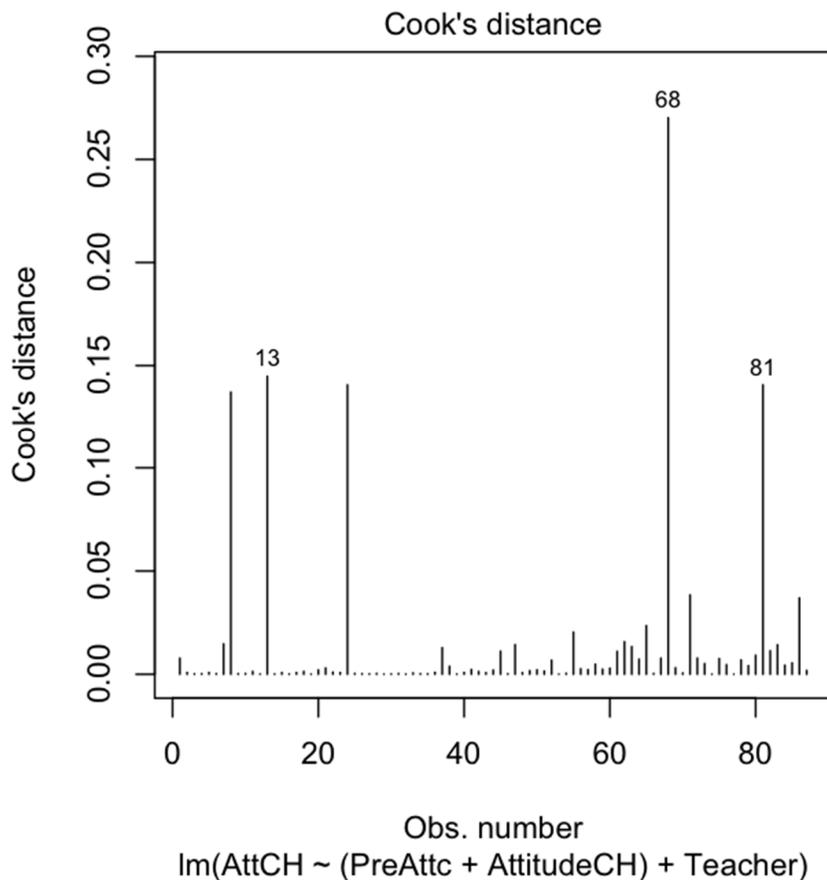
Figure 9. Cook's Distance on change in total attempted notes scores predicted by pretest total attempted notes scores, change in attitude, and teacher, indicating there were no influential points.

Discussion

The current thesis evaluated the effect of implementing a curriculum aimed at intervening on students' motivation in music classes. This was examined through the use of music achievement and attitude towards music, as both predict motivation to engage in music classes (Demorest, Kelley, & Pfordresher, 2017; Green & Hale, 2011; Klinedinst, 1990, Sichivista, 2004; Sichivista, 2007). Specifically, the current thesis aimed to answer the following research questions: (1) Does an 18-week curriculum using recorders in the music classroom enhance students' music acquisition? (2) Does an 18-week curriculum using recorders in the music

classroom positively affect students' attitude towards music? (3) Will students with higher scores on an attitude towards music measure perform better on a note identification exercise? (4) Will students' teachers affect students' note identification and attitude towards music?

Research Question 1

Results on the note identification assessment demonstrated Recorder Karate positively affected students' music achievement through three variables: notes correct, number of attempted notes, and accuracy of correct notes. Recorder Karate works to boost students' motivation to engage in music classes by presenting autonomy over which songs the student learns. Autonomous instruction allows students to connect with the material and encourages class participation (Chang et al., 2016; Gonzalez-Cutre et al., 2018; Renwick & Reeve, 2012). Through this, students demonstrate a desire to want to play their instruments more, learn new songs, and participate in classroom activities. Increased engagement in class would produce great improvements in music achievement, as seen from these results. Continued progression in class would require students to gain an understanding of how to read music. Musical literacy predicts students' motivation to engage in music classes (Klinedinst, 1990). Improvements on music achievement connects to students' motivation to engage in music classes. Furthermore, third grade students demonstrate an ability to effectively learn how to read music through playing the recorder, making Recorder Karate a very accessible curriculum for younger students.

Participants identified as outliers from the analysis of total attempted notes change scores were identified as students in one of the teacher's classes. Further inspection led to the realization that all students in this class attempted each of the 60 items on the Notation Ninja assessment with an increase on occasion from pretest to posttest. Accuracy scores from students within this condition did not demonstrate an equal increase on occasions. This could be

attributable to a difference in test-taking techniques communicated by the teacher: Teacher quality affects student achievement (Gershenhenson, 2016; Harris & Sass, 2011). This difference may come in the way of assessment practices (Wiliam, Lee, Harrison, & Black, 2010).

Research Question 2

Results on the attitude toward music survey demonstrated that Recorder Karate positively affected students' attitudes. The choice in music pieces being learned affects students' value of music (Denac, 2007; Rickard et al., 2012). Furthermore, music achievement affects students' value of music (Klinedinst, 1990). As results of this study indicated improvements on music achievement, improvements on attitudes towards music should be expected. Recorder Karate's effect on motivation to engage in music classes can also be measured through students' reported attitudes towards music. Musical self-concept, self-efficacy, and value are important factors in determining attitudes towards music (Hewitt, 2015; Ng, 2017; Renwick & Reeves, 2012; Yoon, 2017) and were included in Sichivista's (2004) survey. In the adapted version of the survey, demographic information was removed (e.g. socioeconomic status, previous experience in music, etc.). Inclusion of this information may have given explanations for outliers found in the results.

Previous experience in music and parent involvement are largely influential on attitude towards music (Sichivista, 2007; Stewart, 2005). Furthermore, Rickard et al. (2012) states observable effects on attitudes in music might only be observable after one full academic year. Recorder Karate did demonstrate improvements on attitudes towards music after its 18 week implementation. Larger changes in attitudes towards music may be observable under a longer implementation of this curriculum. In this study, Recorder Karate demonstrated a statistically significant positive impact on third grade students' attitudes towards music. Results of Recorder

Karate suggests that playing the recorder is a favorable activity for third grade students (Denac, 2007).

Research Question 3

Results of this study indicated that change in attitude scores did not affect change in Notation Ninja scores. Though previous research suggests that musical self-concept, self-efficacy, and value influence music achievement and performance qualities (Hewitt, 2015; Renwick & Reeves, 2012; Demorest, Kelley, & Pfordresher, 2017), results of this study did not produce similar findings. This project worked under the time frame of 18 weeks, which may not be optimal in finding effects on music achievement from attitude towards music (Rickard et al., 2012). Furthermore, this survey combined self-efficacy, self-concept, and value into one variable: attitude. This did not allow for an analysis of self-efficacy, self-concept, and value to be conducted independently from one another.

Other reasons for these findings may come from school environments, as each teacher managed different schools (Hedden, 1982). Hedden (1982) claims that each school may experience different effects of self-concept and attitude towards music achievement, possibly explaining the inability to determine an effect from these results. Though it is imperative to understand how these self-schemas interact with music achievement, results of this project suggest third grade students may not necessarily have the capacity to illustrate this relationship. Reasons for an inability to demonstrate an interaction between attitudes and music achievement would be attributed to biases held by younger students in self-reported attitudes (Assor & Connel, 2012). These biases may come from a lack of self-knowledge or students answering how they believe the teacher would like.

Research Question 4

Results of this study indicated teachers affected change in Notation Ninja scores. Though a significant improvement in both the Notation Ninja scores and attitude surveys was observed amongst all teachers, an additional amount of variance in Notation Ninja change scores was uniquely attributable to teachers. This furthers the claim that teacher quality affects student achievement and engagement in class (Gershenhenson, 2016; Roorda et al., 2011). Teacher quality may come from experience (Harris & Sass, 2011), or it may come from the teacher's level of engagement (Albert, 2007). Furthermore, teacher's experience and level of engagement directly impacts students' motivation in class (Albert, 2007; Harris & Sass, 2011). The interaction between the teacher, students' achievement, and students' attitudes therefore work to illuminate motivating factors in students' choice to engage in music classes.

Alongside teacher quality, another important factor to take into consideration is fidelity. Implementation fidelity is a large predictor of student achievement (Little et al., 2013). As one of the teachers was only able to give recorder lessons once a week rather than twice, this may be responsible for any variance found due to teacher. However, results from this study indicated the effect of teachers to be most influential on accuracy of correct notes change scores. Teacher's communication of test-taking strategies and use of assessments could also be in effect (Wiliam, Lee, Harrison, & Black, 2010). In order to ensure a successful implementation of this curriculum, teachers must be aware of how their students are being assessed. Students must also receive lessons at least twice a week on recorder to ensure that results can be represented equally, regardless of teacher.

Strengths

Results of this study indicate that Recorder Karate promotes gains in both music achievement and attitude towards music after only 18 weeks of instruction. This is also the first

instance in which the efficacy of Recorder Karate was empirically examined. The Notation Ninja assessment proved to work well at identifying students' musical literacy across three domains: total notes correct, total attempted notes, and accuracy of correct notes. Sichivista's (2004) adapted survey held internal consistency after being revised to accommodate the reading level of third grade students. Taken together, the design of this project effectively answered each of the research questions posed and presented valuable information as to how Recorder Karate may affect students' motivation to engage in music classes.

Weaknesses

Results of this study are limited solely to the performance of students recognized through their ability to recall notation on a staff as well as their expressed change in attitude towards music. These results do not involve the record of any performance elements (e.g., playing tests). Qualitative information regarding students' performance has previously described relationships between attitude towards music and music achievement (Hewitt, 2015; Renwick & Reeves, 2012; Demorest, Kelley, & Pfordresher, 2017). The current thesis revealed unique variance in accuracy change scores on the Notation Ninja assessment attributable to the teacher. Upon further examination, all students within one teacher's class gave answers to each of the 60 items on this assessment with minimal accuracy. This pattern of responding may have limited any ability to determine a relationship between change scores on the Notation Ninja assessment and attitude change scores. Results from this study are limited to third grade students in a southwest school district: A longer implementation of this curriculum may not only further improve on attitudes towards music, but also create a larger, generalizable connection between attitudes towards music and music achievement.

Pieces of music being used by the teachers in this study may not necessarily be culturally inclusive, disallowing some students the opportunity to connect with this music. If the songs are not familiar or interesting, students will not be so motivated to play them. Accessibility to resources is also an important consideration to be had on students' achievement (Stewart, 2005). If students do not have the support from home or from their schools, then they will be under equipped to learn music than a student who might have that access. Children with disabilities have a limited opportunities for feelings of competence, achievement, and autonomy in the music classroom (McPherson, 2015). This study does not take into account those individual differences a student may have as far as mental and physical health in regards to their success in music classes.

Future Directions

Determining the full effects of this curriculum after one full academic year of implementation should be an important step to make in future projects. Longer implementation of this curriculum may fulfill claims made by Rickard et al (2012). Revealing any possible effects of attitude on music achievement and vice versa would prove to be helpful for the field of music education.

The role of the teacher in implementing Recorder Karate should be highly regarded in future projects. Developing a more in-depth look into how Recorder Karate operates inside of the classroom is important to create any sort of narrative out of this data. Gaining teachers' insights and experiences in implementing this curriculum is necessary for constructing an understanding into how exactly these results are being achieved and to determine any common themes shared between teachers. This insight might also contextualize differences between teachers. Furthermore, the teacher must view students as a continuum of learners to be inclusive

(McPherson, 2015). This could be done be ensuring the activities embedded within the curriculum is accessible to all students regardless of ability while also taking into account individual differences. The teacher must be actively involved in each students' learning.

Another prospect of this project is how the adapted attitude survey (Sichivista, 2004) was interpreted. Sum scores were used to interpret and analyze the effects of Recorder Karate on students' attitudes towards music. However, Sichivista (2004) originally presented subscales that may potentially illuminate individual effects on Notation Ninja change scores. The original subscales were as follows: (1) participants' perceptions of their own abilities; (2) participants' personal experiences in their music classes; (3) participant's social experiences in their music classes; (4) participant's value of music; and (5) participants' intentions to continue musical instruction. Further research on whether items from this adapted survey could fit similar subscales should be conducted for potentially two reasons. Firstly, this would produce an in-depth understanding into how these subscales may influence music achievement independent from one another. Secondly, and perhaps more importantly, determining any evidence of subscales from this adapted survey may elucidate interactions shared between them. Sichivista (2004; 2007) used results to determine variance explained in each subscale by other subscales. Attempting to replicate these results would contribute to the breadth of knowledge on attitudes towards music and their individual effect on music achievement.

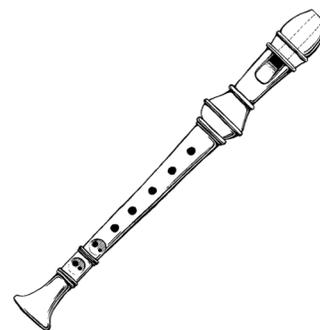**Appendix A**

Music Survey

Name: _____

Music Teacher: _____

Directions: Read the following statements. Circle the answer that best matches you.

Statement	Answers		
1. I learn a lot in music classes.	No	I don't know	Yes
2. It is easy for me to learn about music.	No	I don't know	Yes
3. Singing/playing an instrument makes me feel good.	No	I don't know	Yes
4. I like learning about music.	No	I don't know	Yes
5. I like going to concerts.	No	I don't know	Yes
6. I want to get better in music.	No	I don't know	Yes
7. I enjoy working with my friends in music classes.	No	I don't know	Yes
8. I sing or play better if I practice.	No	I don't know	Yes
9. I like singing with others.	No	I don't know	Yes
10. I can sing or play an instrument well.	No	I don't know	Yes
11. I am doing well in music classes.	No	I don't know	Yes
12. I like singing or playing an instrument.	No	I don't know	Yes
13. I can sing/play songs I like.	No	I don't know	Yes
14. Music is fun.	No	I don't know	Yes
15. I want to be in music classes in the future.	No	I don't know	Yes

References

Albert, D. (2006). Strategies for the recruitment and retention of band students in low

    socioeconomic school districts. *Contributions to Music Education, 33*(2), 53-72.

Allen, R.E. (1992). *The Concise Oxford Dictionary*. Clarendon Press. Oxford: 781

Assor, A. & Connel, J. (1992). The validity of students' self-reports as measures of performance

    affecting self-appraisals. In *Student perceptions in the classroom* (pp. 25-51). Mahwah,

    NJ: Lawrence Erlbaum Associates, Inc., Publishers.

Caldarella, P., Williams, L., Jolstead, K. A., & Wills, H. P. (2017). Managing student behavior

    in an elementary school music classroom: A study of class-wide function-related

    intervention teams. *Applications of Research in Music Education*, *35*(3), 23–30.

    https://doi.org/10.1177/8755123315626229

Chang, Y., Chen, S., Tu, K., Chi, L. (2016). Effect of autonomy support on self-determined

    motivation in elementary physical education. *Journal of Sports Science and Medicine,*

    15(1), 460-466.

Cook, R. (1977). Detection of influential observation in linear regression. *Technometrics,*

    42(1), 65-68.

Cross, I., Hallam, S., & Thaut, M. (2008). *Oxford Handbook of Music Psychology*. Oxford

    University Press.

Denac, O. (2008). A case study of preschool children's musical interests at home and at

    school. *Early Childhood Education Journal*, *35*(5), 439–444.,

    doi:10.1007/s10643-007-0205-4.

Dege, F., Wehrum, S., Stark, R., & Schwarzer, G. (2014). Music lessons and academic

Self-concept in 12- to 14-year old children. *Musicae Scientiae, 18*(2), 203-215.

Demorest, S., Kelley, J., & Pfordresher, P. (2017). Singing ability, musical self-concept, and

    future music participation. *Journal of Research in Music Education, 64*(4), 405-420.

Edgar, S. N. (2017). *Music Education and Social Emotional Learning: The Heart of*

    *Teaching Music***.** Chicago, IL: GIA Publications.

Evans, P. (2015). Self-determination theory: An approach to motivation in music education.

    Musicae Scientiae, *19*(1), 65–83. https://doi.org/10.1177/1029864914568044

Gershenson, S. (2016). Linking teacher quality, student attendance, and student achievement.

    Education Finance and Policy, 11(2), 125-149.

Gliem, J. & Gliem, R. (2003). Calculating, interpreting, and reporting Cronbach's alpha

    reliability coefficient for likert-type scales. In *2003 Midwest Research to Practice*

    Conference in Adult, Continuing and Community Education. Columbus, OH.

Gonzalez-Cutre, D., Sierra, A., Beltran-Carrillo, V., Palaez-Perez, M., & Cervello, E. (2018). A

    school-based motivational intervention to promote physical activity from a

    self-determination theory perspective. *The Journal of Educational Research, 111*(3)*,*

    320-330.

González-Moreno, P., & Mcpherson, G. (2010). Students' motivation to study music: The

    Mexican context. *Research Studies in Music Education, 32*(2), 185-199.

Green, S., & Hale, C. (2011). Fostering a lifelong love of music: Instruction and assessment

    practices that make a difference. *Music Educators Journal, 98*(1), 45-50.

Hallam, S. (2001). The development of expertise in young musicians: Strategy use,

    knowledge acquisition and individual diversity. *Music Education Research, 3*(1), 7-23.

Hair, F. Jr, Black, C., Babin, J., Anderson, E. (2010). Multivariate data analysis: A global

perspective (7th ed.). Upper Saddle River, NJ: Pearson Education Inc.

Harris, D., & Sass, T. (2011). Teacher training, teacher quality and student achievement. *Journal of Public Economics, 95*(7), 798-812.

Hedden, S. (1982). Prediction of music achievement in the elementary school. *Journal of Research in Music Education, 30*(1), 61-68.

Hentschke, L., & Mcpherson, G. (2010). Students' motivation to study music: The Brazilian context. *Research Studies in Music Education, 32*(2), 139-154.

Hewitt, M. (2005). Self-evaluation accuracy among high school and middle school instrumentalists. *Journal of Research in Music Education, 53*(2), 148-161.

Jacobi, B. (2012). Opportunities for socioemotional learning in music classrooms. *Music Educators Journal, 99*(2), 68-74.

Klinedinst, R. (1991). Predicting performance achievement and retention of fifth-grade instrumental students. *Journal of Research in Music Education*, *39*(3), 225. doi:10.2307/3344722.

Koops, L. (2018). Musical tweens: Child and parent views on musical engagement in middle childhood. *Music Education Research, 20*(4), 412-426.

Little, M., Sussman, S., Sun, P., & Rohrbach, L. (2013). The effects of implementation fidelity in the towards no drug abuse dissemination trial. *Health Education, 113*(4), 281-296.

Martinez, A., Coker, C., McMahon, Susan D., Cohen, J., & Thapa, A. (2016). Involvement in extracurricular activities: identifying differences in perceptions of school climate. *Educational and Developmental Psychologist, 33*(1), 70-84.

McPherson, G. E. (2015). *The Child as Musician: A handbook of musical development* (2nd ed.). Oxford University Press.

Ng, C. (2017). Australian primary students' motivation and learning intentions for

    extra-curricular music programmes. *Music Education Research, 19*(3), 276-291.

Philipak, B. (2002). "Recorder Karate. a Highly Motivational Method for Young Players". Plank

    Road Publishing.

Pratkanis, & Greenwald. (1989). A sociocognitive model of attitude structure and function.

    Advances in Experimental Social Psychology, 22(C), 245-285.

Renwick, J., & Reeves, J., (2012). Supporting motivation in music education. *Oxford*

    Handbooks Online. doi:10.1093/oxfordhb/9780199730810.013.0009.

Rickard, N., Appelman, P., James, R., Murphy, F., Gill, A., Bambrick, C. (2012). Orchestrating

    life skills: The effect of increased school-based music classes on children's social

    competence and self-esteem. *International Journal of Music Education, 31*(3), 292-309.

    Roorda, D., Koomen, H., Spilt, J., & Oort, F. (2011). The influence of affective teacher–

    student relationships on students' school engagement and achievement: A meta-analytic

    approach. *Review of Educational Research, 81*(4), 493-529.

Scalas, L., et al. (2016). Music self-concept and self-esteem formation in adolescence: A

    comparison between individual and normative models of importance within a latent

    framework. *Psychology of Music*, *45*(6) 763–780. doi:10.1177/0305735616672317.

Sichivista, V. (2004). Music motivation: A study of fourth, fifth and sixth graders' intentions

    to persist in music. *Contributions to Music Edcuation, 31*(2), 27-41.

Sichivitsa, V. (2007). The influences of parents, teachers, peers and other factors on students'

    motivation in music. *Research Studies in Music Education*, *29*(1), 55–68.,

    doi:10.1177/1321103x07087568.

Stewart, J. (2005). Factors related to students' decisions to continue in band. *Contributions to*

Music Education, 32(1), 59-74.

Tobias, E., Campbell, M., & Greco, P. (2015). Bringing curriculum to life: Enacting

project-based learning in music programs. *Music Educators Journal, 102*(2), 39.

Wiliam, D., Lee, C., Harrison, C., & Black, P. (2004). Teachers developing assessment for

learning: Impact on student achievement. *Assessment in Education: Principles, Policy &*

Practice, 11(1), 49-65.

Xie, J., & Leung, B. (2011). Students' motivation to study music: The mainland China context.

Research Studies in Music Education, 33(1), 59-72.

Yoon, K. (1997, April). *Exploring Children's Motivation for Instrumental Music*. Paper

presented at the biennial meeting of the Society for research in Child Development,

Washington, DC.