UNDERSTANDING THE EFFECTS OF SEQUENTIAL INSTRUMENTAL MUSIC INSTRUCTION ON ACHIEVEMENT IN LITERACY FOR EIGHTH GRADE STUDENTS: A CASE STUDY OF ONE URBAN SCHOOL DISTRICT

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Abstract

During the past decade urban American schools saw a decline in music programs due to value-based decisions favoring investment in subjects with high stakes testing. At the same time advances in neuroscience research point to a link between playing a musical instrument and increased literacy skills. The purpose of this case study was to understand how playing a musical instrument for five consecutive years relates to measures of literacy achievement for urban middle school students. Furthermore, how the perceptions and beliefs of educators about this relationship affect their value-based decisions was explored. The findings indicate that in seven out of eight independent t-tests of eighth grade scores from the 2014 English Language Arts MCAS exam, a statistically significant difference was found suggesting that instrumental students outscore their non-instrumental peers. Focus groups of administrators, music educators and English Language Arts educators were conducted separately and findings yielded nine major themes relating to educators’ perceptions, beliefs and values. They indicate that educators have a belief system that is built on personal experiences and research. Across all three focus groups the belief was expressed that students who study a musical instrument have higher achievement on measures of literacy. This belief paired with the parallel belief that band builds skills for success, guided educators to advocate for decisions that allocate resources to increase opportunity for instrumental instruction in the studied district. Recommendations for practice include increasing opportunity for sequential instrumental instruction in urban public schools and convening small discussion groups of educators, parents or other to discuss perceptions, beliefs and values.

Keywords: achievement, instrumental music, high stakes testing, middle school, literacy, music education
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Dedication

My children inspire me to be and do so much more than I ever thought I could. This personal accomplishment is shared with them as a testament that anything is possible with hard work and perseverance. I started this journey when Emma was young and she has supported me through it with both interest and assistance. Her siblings Sophie and Aidan joined our family during my time in the doctoral program and enriched our lives in countless ways. Collectively their patience and understanding was mature beyond their years. Their laughter and love made this process bearable and I will especially remember the last year when I had at least one child and the laptop in my lap every weekend.

My parents encouraged me to follow my dreams wherever it might take me. As a child growing up in a small urban city similar to the studied district, they made sure that I had the opportunity to learn an instrument and participate in many other artistic endeavors. They also taught me the value of taking pride in your work. These two attributes have led me here and I am grateful for their ongoing support and belief in me from the beginning.

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Chapter One: Introduction

For decades the arts research community has been interested in the relationship between participation in the arts and academic achievement (Kinney D. W., 2008; Burnaford, 2007; Hetland & Winner, 2001). Interest in this connection stems from the need to justify the importance of the arts in our current curriculum. In the wake of the Common Core State Standards and a barrage of high stakes testing of ‘core’ subjects like English Language Arts (ELA) and mathematics, the value of access to quality arts education has waned (McMurrer J., 2008). Numerous research studies suggest that students who participate in music education programs achieve at higher levels than their peers (Deasy, 2002; Burnaford, 2007). Recent innovations in neuroscience research have illuminated the underlying brain processes that may also support this connection. Results from experimental studies employing magnetic resonance imaging (MRI) point to strong differences between playing a musical instrument and cognitive development (Miendlarzewska & Trost, 2014); specific neuroscience research on language acquisition and music has garnered similar strong differences (Barrett, Ashley, Strait, & Kraus, 2013; Corrigall & Trainor, 2011; Kraus, Hornickel, Slater, Thompson, & Strait, 2014).

Researchers have also noted that specific subgroups such as ‘at-risk’ student musicians score significantly higher on standardized tests, indicating that music education may help to close the achievement gap for this population (Kinney D. W., 2008).

Despite a solid body of research to support correlational effects of the arts on academic achievement, music education programs in American schools are on the decline (West, 2012). Unsurprisingly, this trend is more pronounced in urban public schools where funding and resources are scarce (Berliner, 2009; von Zastrow & Jane, 2004). Research points to some reasons for this decline, including an emphasis and allocation of resources to subjects with high-
stakes testing (McMurrer J., 2008; Heilig, Cole, & Aguilar, 2010). In the current educational paradigm where student scores on high-stakes testing determines the quality rating of a school or district, achievement in these regularly tested subjects is weighed heavily (Beveridge, 2010).

This case study uses both quantitative and qualitative strategies to examine the problem of declining access to instrumental music programs in urban schools by investigating the achievement of student instrumentalists on measures of literacy. Through a case study of three middle schools in an ‘underperforming’ urban district, this examines possible differences in this population of students that have been found previously in the literature as well as stakeholder perceptions about these findings.

**Statement of the Problem**

Since the onset of the federal No Child Left Behind legislation of 2001 and the accompanying high stakes testing for accountability, schools nationwide are reducing time in the arts and other ‘traditionally non-tested’ subjects. The purpose of this decrease in arts education is to increase time and remediation in ELA, mathematics, and science (McMurrer, 2008) with the aim of increasing student test scores (Heilig, Cole, & Aguilar, 2010). This reduction of the arts in our schools paired with the ‘back to basics’ mindset (Babo, 2004) has de-emphasized the importance of the arts (David, 2009). The outlook for a reversal of this trend is not likely as Massachusetts moves forward in its high-stakes testing agenda. Strict accountability measures for schools with lower test scores continue and student achievement is now directly linked to educator evaluation (Massachusetts Department of Elementary and Secondary Education, 2014). Furthermore, with the onset of the Common Core State Standards (Bomer, 2011) many states are in the process of adopting a common set of high-stakes assessments (Doorey, 2012). These new assessments by the Partnership for Assessment of Readiness for College and Careers (PARCC)
departs from testing the recall of facts and intends to have students use critical and creative thinking to solve problems (PARCC, 2014). The acquisition of the afore mentioned skills that are intrinsic to learning in the arts may further solidify the relationship between participation in arts education and overall academic achievement as measured on these new standardized tests. Students who do not have access to arts courses that directly teach critical and creative thinking skills will be at an even greater disadvantage regarding the new breed of standardized tests.

When less music courses are offered, scheduling musical ensembles courses such as band and chorus becomes difficult for administrators. This is another reason why ensemble classes specifically are on the decline nationally (West, 2012). As stated earlier, this is the direct result of funding and value based decisions by district and school level administrators (Kelly, 2012). Opportunities are disappearing at a faster rate for students to participate in music through instrumental ensemble classes in many urban school districts where funding is scarce and test scores are low. As these rigorous, standards based, music ensembles are cut out of the regular school day (West, 2012) students of lower socio-economic status lose access and opportunity. Namely, the beneficial changes in the brain related to language acquisition through regular, sequential music instruction as indicated in neuroscience research (Moreno, Friesen, & Bialystok, 2011; Kraus, Hornickel, Slater, Thompson, & Strait, 2014) are not accessible to students in districts where access is unpredictable from year to year. If studies suggest that the duration of music instruction (Corrigall & Trainor, 2011) and the onset of musical instruction at an early age (Barrett, Ashley, Strait, & Kraus, 2013; Bailey & Penhune, 2013) create a stronger positive difference to academic achievement, and if the effect of music instruction on language development is significant for at-risk students (Kraus, Hornickel, Slater, Thompson, & Strait, 2014), then it is plausible that instructional time in music should be increasing rather than
The topic of this study is the relationship between regular participation in an instrumental ensemble and the acquisition of literacy skills. More specifically, this study examines the relationship between English Language Arts (ELA) scores on eighth grade standardized assessments and playing a musical instrument for five consecutive years. A student studying a musical instrument plays between two-five hours per week depending on the level and individual practice outside of the school day. The perceptions of educators concerning this topic are explored through qualitative methods. The students included in the study are from three urban middle schools in the same district. Each student participated during the regular school day in free instrumental classes. It is important to note that by scheduling the instruction during the school day, these students participated less in traditional or remedial ELA instruction than their non-music peers. Equally important is the fact that the majority of students in the researched schools use musical instruments provided free of charge from the district therefore eliminating the economic advantage variable present in other musical instrument instruction studies.

Current research points to positive differences between learning how to play a musical instrument and increased capacity to process and understand language (Kraus, Hornickel, Slater, Thompson, & Strait, 2014; Miendlarzewska & Trost, 2014). Neuroscientists are beginning to uncover possible causes for this relationship through studies with brain imaging technology. Although many studies suggest a difference, through experimental design with musical treatment groups, researchers are moving closer to claiming casual conclusions (Moreno, Friesen, & Bialystok, 2011); data in this vein is preliminary.

This study reviewed literacy acquisition through the ELA Massachusetts Comprehensive
Assessment System (MCAS) for eight grade students. This quantitative data was presented to educators in three focus groups 1) administrators 2) ELA educators and 3) music educators, to gain insight into their perception regarding the topic and their reaction to the preliminary quantitative data.

**Justification for the Research Problem**

Technological advances in the field of neuroscience have enabled new research on the effect of music instruction on the brain (Miendlarzewska & Trost, 2014; Patel A. D., 2011). Because instrumentalists must multitask to play their instruments they are activating multiple areas of the brain (Barrett, Ashley, Strait, & Kraus, 2013). Research on the cognitive effects of music instruction draws correlational evidence to support a connection between playing music and language acquisition (Tierney & Kraus, 2013). Kraus et al. (2014) through their research of instrumental instruction and at risk students attest, “Musical training is another avenue of enrichment that may counteract some of the auditory deprivation endemic to low SES environments.” Also, due to increasing experimental and longitudinal studies that use brain imaging to examine musicians and language acquisition (Schlaug, Norton, Overy, & Winner, 2005; Skoe & Kraus, Musical training heightens auditory brainstem function during sensitive periods in development, 2013; Miendlarzewska & Trost, 2014; Bailey & Penhune, 2013) researchers suggest that evidence of a casual relationship is forthcoming. While this study did not directly measure brain functioning of student musicians, as stated above, it compared the ELA scores of musicians and non-musicians using data from the statewide Massachusetts Comprehensive Assessment System (MCAS). This is similar to research on the topic that measured relationships between instrumental music study and academic achievement on standardized tests (Babo, 2001; Babo, 2004; Huber J. , 2009; Kinney D. W., 2008). Through
focus groups with ELA educators, music educators and administrators, a discussion about their perceptions, beliefs and values regarding students who persist in instrumental music study and the possible difference to achievement in ELA will further illuminate the topic.

In addition to recent advances in neuroscience research, prominent theorists, educators and researchers (Burnaford, 2007; Darby, 1994; Deasy, 2002; Schlaug, Norton, Overy, & Winner, 2005) recognize that learning in and through the arts supports academic achievement in school. Learning in the arts refers to direct instruction in one or more of the art forms (i.e. arts education); learning through the arts refers to the practice of arts integration where the arts are part of an interdisciplinary approach to learning. A complete literature review of arts integration research edited by Burnaford et al. (2007) details both large-scale studies and discrete program analysis related to the integration of arts learning with learning from other subjects. There are seminal research compendia encompassing multiple studies that highlight findings (Fiske, 1999; Deasy, 2002; Rupert, 2006). Some studies directly explore the relationship between participation in the arts and student test scores such as the study by Memmott and Johnson (2006) that showed a positive relationship between high quality arts programs and high student test scores. Vaughn and Winner (2000) find that higher numbers of arts courses taken in high school correlates to higher scores on the SAT. However, Winner and Cooper (2000) later caution that data only supports a difference thus should not be used as evidence of a casual effect.

Student achievement does not solely come from content knowledge. Achievement also means that a scholar possess skills and habits of mind that lead to their success in school. Studies on these ‘soft skills’ are also present in the arts education research. Hetland and Winner (2001) build on their study of high school art students (Winner, Hetland, Veenema, & Sheridan,
2006) where they outline eight “habits of mind” that artists acquire when working deeply in the arts. Through the 21st Century Skills movement leaders such as Sir Kenneth Robinson (2005) and Daniel Pink (2006) emphasize the importance of students acquiring the 4 C’s, (i.e. critical thinking, creativity, communication, and collaboration) which are all skills associated with the arts (Massachusetts Department of Elementary and Secondary Education, 2008; Florida, 2002; Johnson P., 2009; Trilling, 2009). Schatt (2011) explores in detail how motivation in music can lead to continued motivation in other aspects of school.

**Deficiencies in the Evidence**

The body of research on instrumental music instruction and language acquisition is growing steadily but research specific to middle school students in an urban public school is limited. Research in the area of neuroscience strengthens the argument that a positive difference exists but researchers (Patel & Iversen, 2007; Schlaug, Norton, Overy, & Winner, 2005) suggest that more experimental and longitudinal studies are needed to purport a casual relationship. Also, no known studies examine music instrumental instruction that occurs during school hours, in an urban setting where students are provided instruments free of charge, as is the case with this study. Nor do many studies have data from the higher than state average demographics of ‘at-risk’ indicators and standardized testing question types. Furthermore, mixed methods research in a case study format on this topic is not present and therefore adds to the body of literature.

**Relating the Discussion to Audiences**

Stakeholders that will benefit from this study include students, educators, researchers and policy makers. This study contributes to the body of research on the topic and in doing so informs current and future decisions about the importance of musical instrument instruction in
the public schools. For students, the impact of value placed on this endeavor is that they may be provided access and opportunity during the school day and further increase their capacity to achieve in both musical and literacy endeavors. Both teachers and administrators gained insight and information that may assist them in decision making about school music programs and its place in school reform efforts. The fact that this study takes a closer look at the effect of multiple years of free music instruction in an urban district (by looking at the scores of eighth grade students who have taken instrumental lesson for five years) and correlates to a highly regarded outcome of achievement in ELA, is of interest to researchers because it fills a void in the current literature. Moreover, in urban districts the information provided in this study may be a powerful platform for community members as they inform policy makers about the necessity of funding quality music education programs.

Significance of Research Problem

The implications of this research are significant on a local level as well as informing a broader audience nationally or internationally. As stated earlier, McMurrer (2008) reports that a reduction in arts education in schools is occurring nationally. This trend was witnessed locally during the recent economic recession as tight budgets caused reductions in many districts. The district that this study examines did not escape these cuts and although programs are currently restored, the threat of arts education being devalued is real and looming. During changes in the administrative team of the middle schools in this district there has been lapses in regularly scheduled instrumental courses due to the perceived need for increased ELA and mathematics courses. During this academic year, two of the three middle schools have new principals at the helm. Through the educator and administrator focus groups embedded in this study we have a clearer understanding of educator perceptions concerning instrumental study.
Past research on the relationship between the arts and student achievement on high-stakes testing in ELA and mathematics is inconclusive with some studies yielding significant positive differences (Baker, 2012) and others showing little or no effect (Hetland & Winner, 2001). Yet, many educators attest to the anecdotal evidence that students who participate in musical ensembles seem to achieve more academically. Although differential evidence has been found, until recently with the advent of new neuroscience research the reason behind this difference had escaped researchers. As the neuroscience research begins to zero in on why a link exists between music and language skills (Kraus, Hornickel, Slater, Thompson, & Strait, 2014) more real world study of urban populations is needed on the topic. It has been the experience of the researcher that although reputable neuroscience research is available on the topic, educators value statistical data from their population of students. Thus, analysis of ELA achievement data from this district coupled with focus group information on perceptions, beliefs and values of educators adds to the body of research. Furthermore, a case study of this specific district is unique because stakeholders have expressed support for the instrumental program and resources are in place to provide opportunity to larger than average students of low-SES through the free of charge loan of hundreds of musical instruments.

Similar to other recent studies on music instruction and academic achievement of middle school students (Huber J., 2009; Baker, 2012; Babo, 2004), this investigation provided a clearer picture of this relationship. Also similar to the aforementioned studies, the researcher was not interested in finding a casual link but rather investigating a possible relationship. The uniqueness of this study lies in the use of both qualitative and quantitative data analysis to explore this topic. In this way, the many facets of this urban instrumental program are discussed in light of the possible benefit to student musicians regarding literacy. Through the research a
more concrete understanding of the relationship between participation in a musical ensemble and
standardized test scores emerged. This information equips administrators with authentic research
when making important funding and scheduling decisions.

**Positionality Statement**

As a researcher I am interested in this study because of the possible ramifications for arts
educators and the students that they teach. I have recently separated from the studied district to
assume an Assistant Superintendent position in a nearby suburban district. However, my former
position was as the director of fine arts for the studied urban public school district in
Massachusetts. In that capacity I was a central office, district level administrator who oversaw
the arts education programs (i.e. music, visual art, drama and dance) for 26 schools PreK-12 with
an enrollment of 12,500 students. I am a musician who began my instrumental studies in the
fourth grade as part of an urban public school program. Philosophically, I am concerned about
social justice, access and equity for all students in public school regardless of the barriers that
they need to overcome. Through my knowledge of the research associated with the arts and
student achievement I believe that all students should be afforded the opportunity to
meaningfully participate in these programs. Although I have this bias I was diligent to ensure
that it did not affect my ability to conduct the research.

The district is situated is a small urban city of about 100,000 residents where funding is
scarce and the possibility of cuts to arts programming impends. Despite this fact, the city is an
arts focused community ranked seventh in the nation for working artists per capita.
Overwhelmingly, residents demonstrated their support for arts education during a recent budget
crisis. Yet, parental support of the arts is not adequate for decision-makers if it is not backed up
by ‘hard data’ in this data driven decision-making paradigm.
The school district is considered a “Level 4” district by the Massachusetts Department of Elementary and Secondary Education (MA DESE) which indicates that they must make considerable improvements through the use of a state mandated “Accelerated Improvement Plan” (AIP). During my eleven-year tenure with the district I had witnessed many school and district level administrators (including five different Superintendents), make decisions about arts education that had ramifications on the quality and quantity of arts education programs afforded our students.

Data gathered from this district has the potential to yield results that will further the field of music education and education reform. Due to the fact that this district provides lessons and musical instruments free of charge, the high occurrence of low-income students was controlled for at the outset. Due to the fact that a positive difference was concluded, this may have policy implications in the studied district as well as in other urban districts with similar demographics.

**Research Central Questions**

A. The main question that guided this research was:

   How does playing an instrument for five or more consecutive years affect the literacy achievement of middle school students in an urban public school?

B. Sub-questions to probe deeper into this topic include:

   • How do educators’ (i.e. music teachers, ELA teachers and administrators) perceptions of the value of music education change (or remain the same), when presented with quantitative data on playing an instrument and students’ literacy achievement?

   • To what end do these perceptions affect value-based decisions on the part of administrators and educators about students’ access and equity concerning
instrumental music instruction in public schools?

**Theoretical Framework**

Dewey (2001) posits that learning in school should be interconnected. His argument for schools to be organized with interdisciplinary learning occurring among the subjects is one of the first documented arguments in support of the notion of ‘transfer’ of learning. He supported the theory that the interconnectedness of subjects may yield a positive relationship between the learning in one class and the ability to transfer that learning to novel situations in another subject. Therefore, working under this theory, it is plausible that the learning embedded in playing a musical instrument can transfer to language acquisition and overall achievement in literacy.

Additionally, Dewey (2001) argues that students learn best when actively engaged in learning experiences that relate to their home life and speak to their interests. Music ensemble classes meet these criteria by connecting school and home through a regimen of practicing in both environments as well as serving as an intrinsic motivator that keeps interest high. Musical ensembles perform at many school and community related events that engage families and add to student motivation to participate. Moreover, Dewey (2001) argues that it is through hands-on experiences students learn to think critically. Through the act of ‘doing’ the student internalizes the learning. Active music making is literally ‘hands on.’ As recent neuroscience research suggests, the mind of a musician is engaged on many levels. This includes both ‘in the moment’ decision making and problem solving through detection of auditory cues. Most importantly, music making activates many areas of the brain including the centers for language development. If this is true, then student musicians who are actively engaged in playing their instruments are strengthening their ability to think critically and bolster their ability to process language.
**Dewey, Music Education, Arts Integration and Transfer.** John Dewey (1859-1952) was an influential educational philosopher and practitioner who was the driving force behind the Progressive movement in American education. His work affected all aspects of American schooling across all disciplines and also laid the foundation for modern music education philosophy as evidenced in early music textbooks (Goble, 2005). Dewey advocated for a break from the educational trends of the day, which included the recitation, and drill of facts. Rather, he advocated for an experiential, hands-on approach to learning (Kelly, 2012). Darby and Catterall (1994) cite the philosophy of John Dewey and the Progressive movement as pivotal to the inclusion of arts education in PK-12 schools. Furthermore, Dewey (2001) believed in “fourfold interests — the interest in conversation, or communication; in inquiry, or finding out things; in making things, or construction; and in artistic expression,” (Dewey, 2001, p. 31). He states that, “If there is sufficient intrinsic interest in the material, there will be direct or spontaneous attention, (p. 93). These interests that are present in music ensemble classes have the ability to engage students in their learning. He believed that music was important to society as a whole and increased one’s quality of life (Kelly, 2012) furthermore that musical training was not merely to produce professional musicians.

Dewey’s broader view on the importance of experiences over information, and connectedness of learning versus discrete subject specific learning is a view that remains a point of debate in present day educational circles. Similar to proponents of arts integration, he advocated for the interrelatedness of subjects and the teaching of these subjects not in isolation but in their proximity to how they pertain to the life of the student. He asks in relation to this idea, “How, upon this basis, shall the child get the needed information; how shall he undergo the required discipline? Yes, it has come to this, that with many, if not most, people the normal
processes of life appear to be incompatible with getting information and discipline” (Dewey, 2001, p. 37). In music ensemble classes, students participate due to their high interest in the music making and this interest may serve as a bridge between school and home life.

Further remarks include his dislike of education paradigms where subjects are taught in isolation stating, “It is easier to see the conditions in their separateness, to insist upon one at the expense of the other, to make antagonists of them than to discover a reality to which each belongs” (Dewey, 2001, p. 104).

John Dewey (2001) theorized that all learning was interconnected and therefore learning on one area can be transferred to application in another. They further believed that through hands-on application in various subject areas, students learn critical and creative thinking. In using the theory of interconnectedness as a lens, transfer of learning and difference between music and ELA are plausible.

**Terms Defined**

**Academic Achievement:** is defined as achievement in formal schooling through indicators such as grades, grade point average (GPA), and scores on standardized assessments at the national level (e.g. Scholastic Aptitude Test (SAT), National Assessment of Educational Progress (NAEP), Partnership for the Assessment of Readiness for College and Career (PARCC) examination), or the state level such as the Massachusetts Comprehensive Assessment System (MCAS) which is the measure used in this study.

**At-Risk Students:** “The term at-risk is often used to describe students or groups of students who are considered to have a higher probability of failing academically or dropping out of school. The term may be applied to students who face circumstances that could jeopardize their ability to complete school…” (Great Schools Partnership, 2013). For the purpose of this study groups of
at-risk students include: minorities, those living in poverty, students with special education services, English Language Learners or students whose first language is not English.

**Arts:** one of five performing or visual creative arts including: music, theatre/drama, dance, visual art and media arts. These disciplines have both state and national level standards for pre-kindergarten to grade twelve education.

**English Language Learners:** (ELLs), “…are students who are unable to communicate fluently or learn effectively in English, who often come from non-English-speaking homes and backgrounds, and who typically require specialized or modified instruction in both the English language and in their academic courses.” (Great Schools Partnership, 2013)

**Instrumental Ensemble Classes:** sequential instruction in a small group lesson setting with the objective to teach the reading of music notation and playing of a woodwind, brass, percussion or stringed western traditional instrument. For this study instrumental ensemble classes consist of band instruments (woodwind, brass and percussion) and occur in a group setting of 20-50 students. Regular instruction is at least 30 minutes per class, at least once per week. Most classes in this district’s middle schools occur on average 45 minutes twice in a six-day cycle. It is assumed that instrumental students are practicing at home in addition to playing during classes.

**Music Education:** sequential and authentic instruction in the discipline of music occurring as a regularly scheduled course in school. A certified music educator who is licensed by the state usually teaches music education in public schools. Lessons are designed based on state and national standards and incorporate the learning topics such as singing, reading music notation, playing instruments, composition, music history and improvisation.

**Partnership for Assessment of Readiness for College and Careers (PARCC):** is a newly
developed standardized test that was created by the PARCC organization with the aim to develop a nationwide system for assessing achievement on the Common Core standards. The designers claim that these exams depart from testing the recall of facts with the intention to have students use critical and creative thinking to solve problems (PARCC, 2014).

**Plasticity:** Plasticity is a fundamental organizational feature of human brain function. Traditionally, the brain was thought to be hardwired following critical period in development. However, it is now accepted that the brain has a remarkable capacity to modify its structural and functional organization throughout the life span, in response to changes in environmental input. (Wan & Schlaug, 2010)

**Pull-out Model:** This term is used when instrumental instruction is scheduled during the regularly scheduled time of another subject. Thus students are essentially being ‘pulled-out’ of the regularly scheduled class to receive instrumental instruction. For example, instrumental instruction for beginning clarinetists is scheduled during part of an ELA class because only a handful of students are receiving instruction from each ELA class scheduled at a given time. It is a common model in elementary schools. At the middle level students are sometimes ‘pulled-out’ for large-scale dress rehearsals that require students from multiple grades prior to concerts.

**Socio Economic Status (SES):** “Socioeconomic status is commonly conceptualized as the social standing or class of an individual or group. It is often measured as a combination of education, income and occupation. Examinations of socioeconomic status often reveal inequities in access to resources, plus issues related to privilege, power and control.” (American Psycological Association, 2014)
**Transfer:** the act of learning on one domain or subject area being applicable or reinforcing the learning in another domain or subject area. In arts research this is often referred to as the ‘instrumental argument’ for arts education. Proponents believe that the purpose of arts education is to learn skills that can be transferred to other academic domains thus holding the arts as an instrument in accessing other subject matter.

**Values:** according to (Saldaña, 2009, p. 89) “value is the importance we attribute to oneself, another person, thing, or idea. And attitude is the way we think and feel about oneself, another person, thing, or idea. A belief is part of the system that includes our values and attitudes, plus our personal knowledge experiences, opinions, prejudices, morals, and other interpretive perceptions of the social world.” (p. 89)
Chapter Two: Literature Review

Education in American public schools is in a period of transition and reformation as stakeholders struggle with ever increasing extrinsic and intrinsic demands. Pressures such as federal and state mandated reforms that include high stakes testing, coupled with accountability measures, (Doorey, 2012) rigorous Common Core Standards, (Conley, 2011; Massachusetts Department of Elementary and Secondary Education, 2010) and educator evaluation based on student achievement (MA Board of Elementary and Secondary Education, 2013) are compounded in urban education environments. This is because in addition to these extrinsic pressures, urban schools must also compensate for the inherent educational needs of students from poverty, including cognitive and socio-emotional deficiencies, provisioning for non-academic barriers to success (e.g. unstable shelter or regular nutrition, unpredictable mental or physical health resources) and providing additional supports for a larger than average population of English language learners (Walsh, et al., 2014). With decreasing budgets that are less than adequate to provide for students in these ‘at risk’ populations, educators are faced with difficult decisions as they attempt to close the achievement gap.

In this educational paradigm, music education in our public schools is on the decline (McMurrer, Instructional Time in Elementary Schools: A Closer Look at Changes for Specific Subjects, 2008; David, 2009). The decline is most pronounced in areas with high poverty due to the perceived need for resource allocation toward remediation in traditionally tested subjects such as ELA and mathematics (Basmat & Speigelman, 2012; West, 2012; Parsad & Spiegelman, 2012). The waning of music education in urban schools continues despite the fact that there is ever increasing research to support the relationship between music instruction and academic achievement for students from low socio-economic (SES) backgrounds (Catterall, Dumais, &
Hampden-Thompson, 2012; Slater, Strait, Skoe, O' Connor, Thompson, & Kraus, 2014).

As new research on the arts, learning and brain function become more sophisticated and conclusive the downward trend in music education may reverse if educational leaders and policy makers perceive time dedicated to music as a worthwhile endeavor (Moreno, Friesen, & Bialystok, 2011). In general, the broadness of past arts studies are being replaced with specific research on the benefits of music instruction in relation to cognitive and affective domains (Moritz, Yampolsky, Papadelis, Thompson, & Wolfe, 2012). While causality remains in question, (Miendlarzewska & Trost, 2014; Barrett et al., 2013), the presence of true experimental studies and strong differences of arts learning to benefits in other domains now exist (Tierney & Kraus, 2013) with some focusing specifically on low income students and literacy achievement associated with musical interventions (Slater, Strait, Skoe, O' Connor, Thompson, & Kraus, 2014).

This review of the literature concerns the following question: How does playing an instrument for five or more consecutive years affect the literacy achievement of middle school students in an urban public school? In broader terms this review seeks to explore the relationship between music education and academic achievement. It is organized into four major sections. The first section is a historical perspective of research in arts learning in relation to overall achievement. This lays the foundation for the major trends in the literature and highlights the early discourse on the notion of ‘transfer.’ The next section explores studies specific to music education and student achievement. An emphasis on research pertaining to music instruction correlating with higher scores on standardized testing as well as overlap in musical and language learning is discussed. An overview of the Massachusetts Comprehensive Assessment System with detail on the English language arts standards that are represented on the eighth grade
assessment constitutes the third section. Lastly, the fourth section of this review outlines recent advances in neuroscience research that illustrate a connection between music learning and language. With newly available technology, researchers are able to test and explain the physiological basis for transfer between musical and other cognitive domains (Miendlarzewska & Trost, 2014). Within this review, research specific to urban education and the middle school grade spans will be presented when available. What is not included in this review are studies that solely pertain to a) an art form other than music, b) music and a discipline other than ELA, c) listening to music and academic achievement, or d) music and neuroscience of non-school aged participants.

**Historical Perspective of Arts Research and Overall Student Achievement**

Arts education in American schools is comprised of the visual arts and performing arts that encompass instruction in drama, dance and music. New National Common Core Standards in the Arts released in June 2014 inserts ‘media arts’ as a fifth discipline into this category (National Coalition for Core Arts Standards, 2014). Music education typically is comprised of training in both vocal and instrumental techniques with the later offered as a possibility for specialization through group instrumental lessons and band or orchestra ensembles. The focus of this study is on students who chose to play a band instrument in fourth grade through and have persisted playing the musical instrument throughout the eight grade. Although some of the seminal research on the “arts” and student achievement will be discussed, the primary focus of the review is on prominent and recent research concerning music education.

During the history of modern arts education in schools, practitioners look to the research community to justify the need for increased, equitable, and sustained access. Throughout the over forty year history of Harvard’s Project Zero, researchers such as Howard Gardner, (1983)
with his theory of multiple intelligences and Jessica Hoffman Davis (1999; 2007) who advocates for the importance of the arts in a well-rounded education, helped lay the groundwork for serious study of how the arts affect teaching and learning. In the late twentieth century, movements in arts research began to closely correspond to trends in general education. During this time the notion of ‘transfer,’ whereas, learning in the arts supplements or enhances learning in other subjects, gained prominence in research streams (Deasy, 2002). This theory segmented the research community more so than any other with supporters and dissidents debating the validity of transfer to present day.

During the past three decades the arts research community produced a range of investigations about children and artistic experiences (Deasy, 2002; Burnaford, 2007; Baker, 2012). Possibly the most prominent involved the difference between participation in arts and overall academic success in school. Arts Education Partnership (AEP) publishes compendiums with seminal studies in this vein. One of these edited by Fiske (1999) presented seven major studies on the arts and academic achievement. Within this document, Catterall, Chapleau, and Iwanga (1999) present findings from the National Educational Longitudinal Survey (NELS) that encompass information from over 25,000 students in eighth through twelfth grade. They concluded that over a ten-year period, students with higher participation in the arts had greater academic gains than their non-arts peers. Additionally, students from low socioeconomic status (SES) backgrounds who were involved in instrumental music programs scored higher than non-musicians. Deasy (2002) authored another AEP compendia publication that presents 62 peer reviewed studies representing the breadth and scope of arts research at that time; this publication examines both academic and social development of young people who are involved in the arts. Transfer is a major theme in the included essays (Burnaford, 2007).
A 2005 College Board study reported that student scores on both verbal and mathematics Scholastic Aptitude Test (SAT) exams increased proportionally as the number of years of participation in the arts in high school increased (The College Board, 2005). Furthermore, students who participated for four years in arts education scored 58 points higher than non-arts peers on the verbal section (Rupert, 2006). In a 2009 study of over 200 schools in New York City, findings show that the schools with the top third percentage of graduation rates also had the most access to arts education for their students (Israel, 2009). More recently, Catterall, Dumais, and Hampden-Thompson, (2012) utilized four large national databases sponsored by the U.S. Department of Education to analyze the relationship between academic achievement and arts learning for at-risk students. Among the findings from this research is that arts-engaged secondary students have better grades and higher rates of graduation than those who do not participate in the arts.

The research presented above utilizes quantitative data from large data sets to support the difference between students who participate in arts activities and their success in other measures of academic achievement. There are also a host of studies on arts integration and student success. According to Burnaford et al. (2007) the definition of arts integration is not universal as there is not consensus in the arts education community. At the most basic level most can agree that arts integration is about learning in and through the arts, with the purpose of helping students make connections across disciplines.

Due to the integrative nature of this approach, arts integration practitioners have a heightened interest in transfer and how the arts can enhance learning in other subjects. Studies that highlight large scale school reform efforts such as Changing Education through the Arts Challenge (TETAC) (Hutchens & Pankratz, 2000), the A+ Schools movement (Barry,
Gunzenhauser, Montgomery, & Rabier, 2003; Marron, 2003) and the Chicago Arts Partnership in Education (Fiske, 1999) are included with smaller scale studies on arts integration in the literature review by Burnaford et al. (2007). Another comprehensive resource for this stream of literature is by Gullatt (2008) with the intent of providing a rationale for the benefit of arts programs in the school reform.

More recently through the 21st Century Skills movement, educators, business leaders and policy makers note that students who participate in arts learning have important skills that are needed for the 21st century workforce (Massachusetts Department of Elementary and Secondary Education, 2008; Florida, 2002; Johnson P., 2009; Trilling, 2009). Pink (2006) asserts that the “MFA is the new MBA” (p. 196) because industry is searching for creative and critical thinkers to drive innovation. Friedman (2007) agrees with Pink stating that study of the liberal arts (including music and visual arts) enable people to gain ‘right brained’ skills such as creativity that will be necessary to succeed in a ‘flattened’ global economy. Although the arts are not the only discipline that can cultivate creativity, Robinson agrees that arts disciplines do promote the “skills aptitudes and values that are at the heart of America’s growing ‘creative’ economy…” (Robinson, 2005, p. 3). Although theorists and policy makers cite anecdotal evidence, (Winner & Cooper, 2000) research to support these claims is not abundant.

Baumgartner (2001) cautions that many of the previous studies on arts education and arts integration should be clearly presented as correlational and should not be misconstrued as a case for causation. He states this because variables such as differences in SES and innate ability may be present in arts interested students. Catterall et al. (2012) echo this caution stating that although their current research explores the association between the arts and better academic outcomes, more research is needed that “controls for a wide array of individual and social
variables” (p. 11). Winner and Cooper (2000) eloquently state this sentiment asserting, “The existence of a difference cannot tell us whether the arts cause academic improvement, whether academic achievement causes involvement in the arts, or whether study of the arts and achievement in academics are both caused by some third independent factor” (p. 14).

The Question of Transfer

Eisner (1998) concurs that for arts research to claim transfer there needs to be more experimental, random and specific studies showing statistically significant data. Interestingly, the type of research that he calls for has recently come out in the field of neuroscience and music that is reviewed later in this document. Scripp (2002) contends that there are two differing viewpoints on the role of music education in regard to transfer. He states that “essentialists” believe in the ‘arts for arts sake’ argument emphasizing the intrinsic benefit of learning skills inherent to music making. Those interested in the “instrumental” rationale for music education acknowledge that learning acquired during music instruction can either transfer to other domains or be a catalyst for the learning of connected concepts.

Due to the inclination to justify the importance of the arts in relation to the effect on student achievement in other subjects and the resurgence of arts integration’s prominence over arts education, the aforementioned counter-movement of ‘arts for art’s sake’ arose. Eisner further queries, “Have they ever thought about asking how reading and maths courses contribute to higher performance in the arts?” (Eisner, 1998, p. 51). This movement was fueled by the theory that arts education uniquely provides students with learning that cannot best be obtained elsewhere. Hetland and Winner, (2001) challenged the theory on the arts and transfer through their extensive meta-analysis titled “Arts and Academic Achievement, What the Evidence Shows.” Although theses researchers previously published studies on the relationship between
the arts and academic achievement (Hetland, 2000), through the meta-analysis they contested that statistically significant data was lacking to claim a causal relationship (Winner & Cooper, 2000).

Building on their previously mentioned meta-analysis Hetland, Winner (2006) and their colleagues Veenema and Sheridan conducted a study of high school art students with the intent to understand the arts based learning that occurs when students are actively involved in arts education. What resulted is their book *Studio Thinking* (2007), where they outline eight “Habits of Mind” that artists acquire when working deeply in the arts. These habits of mind are: (1) Develop Craft, (2) Engage and Persist, (3) Envision, (4) Express, (5) Observe, (6) Reflect, (7) Stretch and Explore, and (8) Understand the art world. Davis (2007) adds to this list of innate arts learning citing both visual and performing arts studies. Her additional arts acquired traits are: (1) Tangible product: Imagination and Agency, (2) Focus on emotion: Expression and Empathy, (3) Ambiguity: Interpretation and Respect, (4) Process orientation: Inquiry and Reflection, (5) and Connection: Engagement and Responsibility. The authors suggested that this research forms a basis for further research on the arts and transfer. Few would argue that there is great value to learning arts intrinsic skills and habits of mind however, inroads in neuroscience research also stabilize theories on arts learning transfer to non-artistic domains.

**Music Education and Academic Achievement in ELA**

Baker (2011) cites historical records indicating that the roots of music education can be traced back to 1620 with the advent of Psalter singing in colonial churches. Though, it was not until 1837 that Lowell Mason was the first person to be appointed as a music supervisor in the Boston Public Schools (Baker, 2011). These facts do not discredit the importance or benefits of the other art forms in educational settings. However, the abundance of research on music
education paired with the longevity of this discipline constitutes the rationale for the narrow focus of this study.

There is research that supports a relationship between music instruction and a myriad of possible differences including mathematics and ELA achievement (Vaughn, 2000). The focus in this review remains on the acquisition of language skills that has been measured predominantly through the study of young children involved in musical interventions and through difference between scores on standardized tests and music participation. Regarding the former type of study, Corrigall & Trainor (2011) query, “Because musical skills are associated with reading skills, it is reasonable to ask whether music training improves reading skills” (p.149). They contend that included in the explanation for this potential transfer, is that music training leads to increased auditory sensitivity, reading musical notation is akin to reading text, singing text segmented into syllables may strengthen reading skills and the concentration and focus necessary for music instruction may propel students to persist with reading. Anavari, Trainor, Woodside, & Levy, (2002) noted, “Music, like language, is based in the auditory modality and the primary mode of music production, singing, uses the same vocal apparatus as speech” (p. 112). They contend that both music and speech rely on the combination of smaller segments of sounds that similar to notes in music, in speech are called phonemes. In a study of 100 four and five year olds, Anvari et al. (2002) found that musical skills predicted reading ability. Using an experimental design Moritz et al. (2012) studied ‘phonological awareness sub-skills’ in five year old pre-readers who participated in either a weekly 35 minute regular music class (control group) or a daily 45 minute Kodaly technique music class (experimental group). Significant findings included disproportionately increased ability in rhyming skills, phoneme segmentation and rhythm pattern production for the group that received daily instruction. If phonological
awareness enhances reading ability, Moritz et al. (2012) suggest that musical training in young children could further this aim. Analogously, Moreno, Friesen, & Bialystok (2011) investigated pre-literacy skills and musical training through a 20 day intervention of either music or visual art. Both groups of children improved on the phonological awareness measure but the musical group improved significantly more on the measure of visual-auditory learning.

The Massachusetts Comprehensive Assessment System (MCAS)

According to the website of the Massachusetts Department of Elementary and Secondary Education (MADESE), the Massachusetts Comprehensive Assessment System (MCAS) “…is designed to meet the requirements of the Education Reform Law of 1993. This law specifies that the testing program must

- test all public school students in Massachusetts, including students with disabilities and English Language Learner students;
- measure performance based on the Massachusetts Curriculum Framework learning standards;
- report on the performance of individual students, schools, and districts.

In addition, the MCAS program is used to hold schools and districts accountable, on a yearly basis, for the progress they have made toward the objective of the No Child Left Behind Law that all students be proficient in Reading and Mathematics by 2014.” (Massachusetts Department of Elementary and Secondary Education, 2010).

MCAS assessments are administered at multiple grade levels starting in the third grade and ending in the tenth grade (or until a student passes the exam). Assessments are in (a) mathematics, (b) science and technology/engineering and (c) English Language Arts (reading and composition). As the MADESE investigates an upgrade to the current MCAS, districts in
the Commonwealth were encouraged to “test-drive” the nationally administered PARCC exam. On November 17, 2015, Massachusetts Board of Education voted to develop this next-generation MCAS exam that they state, “…will build upon the best aspects of the MCAS assessments that have served the Commonwealth well for the past two decades. The test will include innovative items developed by PARCC, along with new items specifically created to assess the Massachusetts learning standards.” (Massachusetts Department of Elementary and Secondary Education, 2016)

For the purposes of this study, information pertaining to the English Language Arts MCAS is discussed. Specifically, the 2014 Eight Grade ELA Reading Comprehension MCAS assessment will be analyzed in this study so the following information will pertain directly to that test.

**Ways of scoring for MCAS tests.** Schools and school districts in Massachusetts are held accountable for their students’ test scores on MCAS (or PARCC). Various types of student score reports are provided to determine student achievement levels. According to the website for the Massachusetts Department of Elementary and Secondary Education (MA DESE), “Student results on the MCAS tests are reported according to four performance levels: Warning/Failing, Needs Improvement, Proficient, and Advanced.” (Massachusetts Department of Elementary and Secondary Education, 2014) This way of scoring the report plays heavily into the school and district accountability rating for the year with extra emphasis on the number of students who are scoring proficient or higher. The MA DESE (2014) provides the following general definitions of the four MCAS performance achievement levels which are designated by the scaled score as defined by the Board of Elementary and Secondary Education.
• **Advanced** - Students at this level demonstrate a comprehensive and in-depth understanding of rigorous subject matter, and provide sophisticated solutions to complex problems.

• **Proficient** - Students at this level demonstrate a solid understanding of challenging subject matter and solve a wide variety of problems.

• **Needs Improvement** - Students at this level demonstrate a partial understanding of subject matter and solve some simple problems.

• **Warning (Grades 3-8)/Failing (High School)** - Students at this level demonstrate a minimal understanding of subject matter and do not solve simple problems.

The achievement level is determined by the scaled score. This is a conversion from the actual points that are awarded for correct answers. Each year the scale is decided based on the cohort who participated in the assessment. According to the MA DESE (2014), to be considered “Advanced” a student must score between 260-280; for a “Proficient” rating a student must have a score of 240-258 whereas; “Needs Improvement” is 220-238; and Warning/Failing is considered to be in the range of 200-218.

Percent correct is a simplistic scoring report that illustrates the percent of the questions that students answered correctly rather than the points given that are associated with certain questions. The last scoring report, ‘Student Growth Percentile’ is different than the first three because it takes into account the student’s previous MCAS tests from prior years to calculate the student’s growth over time. It can only be calculated if a student has taken an MCAS of the same subject the previous year. This metric allows for growth to be factored into the general assumption of achievement. This type of report is valuable to show gains made by students in
one year especially if proficiency is not yet reached. However, it is noted that if students are consistently achieving at high levels the opportunity for high growth is not possible.

**Types of questions for the MCAS reading comprehension test.** The ELA MCAS for Eighth Grade has two types of questions: multiple-choice and open-response. This test does not have writing prompts for longer open-response questions because those are usually part of the ELA Composition Test administered in other grades. Multiple-choice questions are a common question type on standardized tests due to the ability to use a machine to score. Students are provided with four answer choices and are prompted to choose the best answer for the given question. Open-response questions are the second type of question on the ELA MCAS test for eighth grade. As stated on the MA DESE (2014) website, these types of questions, “require students to generate rather than recognize, a response,” by creating, “a one-or two-paragraph response in writing.” Open-response scores are calculated through the use of a scoring guide on a scale of 0-4 points. Due to the nuance involved in these types of responses, trained scorers are utilized rather than machines. Lastly, the mechanics of language such as spelling, punctuation, or grammar are not scored for this question type. An example of an open response question on from the 2014 Eighth Grade ELA MCAS is in Figure 2.1.
Figure 2.1 Example of Open Response Question Type – for Reading Anchor Standard Key Ideas and Details

<table>
<thead>
<tr>
<th>Question 7 is an open-response question.</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Read the question carefully.</td>
</tr>
<tr>
<td>- Explain your answer.</td>
</tr>
<tr>
<td>- Add supporting details.</td>
</tr>
<tr>
<td>- Double-check your work.</td>
</tr>
</tbody>
</table>

Write your answer to question 7 in the space provided in your Student Answer Booklet.

7 Explain how the concepts in the article could be applied to a school environment. Support your answer with relevant and specific information from the article.

Source: (Massachusetts Department of Education, 2011)

**Standards addressed on the MCAS reading comprehension test.** The 2014 ELA MCAS test is based on state determined grade level expectations for student learning. These expectations are derived from the “Massachusetts Curriculum Framework for English Language Arts and Literacy,” that will be refereed to in the subsequent section as the ‘Curriculum Frameworks’ (2011). The ‘Curriculum Frameworks’ document is a revision from previous state expectations. The document has the sub-title, “Incorporating the Common Core State Standards for English Language Arts and Literacy in History/Social Studies, Science, and Technical Subjects.” This reflects the fact that the current set of Massachusetts standards is organized by and has content that is in line with, the national “Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects” developed by the National Governors Association (2010). This distinction is important because the national PARCC tests and the new MCAS 2.0 tests that are under development in Massachusetts also are based on these standards.

For the purposes of this study, this information is also important because the student achievement data is also analyzed based on the College and Career Readiness (CCR) Standards
that are addressed in individual questions. This analysis allows the researcher to look specifically at the relationship between instrumental students and specific types of literacy skills. As stated in the ‘Curriculum Frameworks’ document,

The CCR standards anchor the document and define general, cross-disciplinary literacy expectations that must be met for students to be prepared to enter college and workforce training programs ready to succeed. The pre-k–12 grade-specific standards define end-of-year expectations and a cumulative progression designed to enable students to meet college and career readiness expectations no later than the end of high school.

(Massachusetts Department of Education, 2011, p. 4)

Within the Massachusetts Curriculum Frameworks for ELA and Literacy there are four types of ‘College and Career Readiness (CCR) Anchor Standards’ (2011): (1) Reading, (2) Writing, (3) Speaking and Listening, and (4) Language. It is stated that these headings designate the strands of literacy with each strand being headed by a CCR anchor standard that cuts across grade levels followed by grade specific standards in each strand. The 2014 ELA MCAS taken by the eighth graders across the state had two of these CCR Anchor standards/strands represented. The Language Anchor Standard was represented with questions including Vocabulary Acquisition and Use’ while the Reading Anchor Standard had questions originating from strands including - ‘Craft and Structure,’ and ‘Key Ideas and Details’. In the discussion below, each of these strands and standards will be discussed prior to their respective data analysis.

Language anchor standards. The ‘Curriculum Frameworks’ state the following about the Language Anchor standards as a category:
“The Language standards include the essential “rules” of standard written and spoken English, but they also approach language as a matter of craft and informed choice among alternatives. The vocabulary standards focus on understanding words and phrases, their relationships, and their nuances, and on acquiring new vocabulary, particularly general academic and domain-specific words and phrases.” (Massachusetts Department of Education, 2011, p. 10)

Furthermore, Table 2.1 with information taken from (Massachusetts Department of Education, 2011) provides the definition of each anchor standard in the Language Strand.

Table 2.1 College and Career Readiness Anchor Standards for Language

<table>
<thead>
<tr>
<th>Conventions of Standard English</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.</td>
</tr>
<tr>
<td>2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Knowledge of Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Vocabulary Acquisition and Use</th>
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</thead>
<tbody>
<tr>
<td>4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.</td>
</tr>
<tr>
<td>5. Demonstrate understanding of figurative language, word relationships and nuances in word meanings.</td>
</tr>
<tr>
<td>6. Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.</td>
</tr>
</tbody>
</table>

Source: (Massachusetts Department of Education, 2011, p. 33)
The Vocabulary Acquisition and Use questions accounted for 4 points on the 2014 ELA MCAS. An example of a question from the 2014 Eighth grade ELA MCAS that addresses this strand is in Figure 2.2.

Figure 2.2 Example of Language Anchor Standard – Vocabulary Acquisition and Use

What does the word *simulate* mean as it is used in the last sentence of paragraph 10?

A. extend
B. imitate
C. encourage
D. recommend

Source: (Massachusetts Department of Education, 2011)

**Reading anchor standards.** The Reading Anchor Standards also figure prominently in the Eighth Grade ELA MCAS exam. The ‘Curriculum Frameworks’ state the following about the Reading Anchor standards as a category:

“The Reading standards place equal emphasis on the sophistication of what students read and the skill with which they read. Standard 10 defines a grade-by-grade “staircase” of increasing text complexity that rises from beginning reading to the college and career readiness level. Whatever they are reading, students must also show a steadily growing ability to discern more from and make fuller use of text, including making an increasing number of connections among ideas and between texts; considering a wider range of textual evidence; and becoming more sensitive to inconsistencies, ambiguities, and poor reasoning in texts.

(Massachusetts Department of Education, 2011, p. 10)
Furthermore, Table 2.2 provides the definition of each anchor standard in the Reading Strand.

Table 2.2 College and Career Readiness Anchor Standards for Reading

<table>
<thead>
<tr>
<th>Key Ideas and Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.</td>
</tr>
<tr>
<td>2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.</td>
</tr>
<tr>
<td>3. Analyze how and why individuals, events, and ideas develop and interact over the course of a text.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Craft and Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.</td>
</tr>
<tr>
<td>5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.</td>
</tr>
<tr>
<td>6. Assess how point of view or purpose shapes the content and style of a text.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Integration of Knowledge and Ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.</td>
</tr>
<tr>
<td>8. Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.</td>
</tr>
</tbody>
</table>

*MA.8.A. Analyze the meanings of literary texts by drawing on knowledge of literary concepts and genres.

<table>
<thead>
<tr>
<th>Range of Reading and Level of Text Complexity</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.</td>
</tr>
</tbody>
</table>

Source: (Massachusetts Department of Education, 2011, p. 13)
The Craft and Structure questions accounted for 15 points on the 2014 ELA MCAS. An example of a question from the 2014 Eighth grade ELA MCAS that addresses this strand is in Figure 2.3. In the same regard, the Key Ideas and Details questions accounted for 31 points on the 2014 ELA MCAS. An example of a question from the 2014 Eighth grade ELA MCAS that addresses this strand is in Figure 2.4.

Figure 2.3 Example of Reading Anchor Standard – Craft and Structure

<table>
<thead>
<tr>
<th>4</th>
<th>What is the effect of the alliteration in the headings of paragraphs 10, 11, 12, and 159?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A. It creates a playful tone in the article.</td>
</tr>
<tr>
<td></td>
<td>B. It mimics the sounds found in nature.</td>
</tr>
<tr>
<td></td>
<td>C. It emphasizes the importance of music.</td>
</tr>
<tr>
<td></td>
<td>D. It gives a professional feel to the article.</td>
</tr>
</tbody>
</table>

Source: (Massachusetts Department of Education, 2011)

Figure 2.4 Example Reading Anchor Standard – Key Ideas and Details

<table>
<thead>
<tr>
<th>1</th>
<th>Based on the article, why would a company most want to improve its work environment?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A. Maintaining beautiful grounds attracts customers.</td>
</tr>
<tr>
<td></td>
<td>B. Providing opportunities to be with animals reduces stress.</td>
</tr>
<tr>
<td></td>
<td>C. Creating a pleasant space increases efficiency and profits.</td>
</tr>
<tr>
<td></td>
<td>D. Constructing an enclosed conversation area makes people feel safe.</td>
</tr>
</tbody>
</table>

Source: (Massachusetts Department of Education, 2011)

Not all anchor standards in Table 2.2 were directly assessed in the 2014 Eighth Grade ELA MCAS. More information on the Curriculum Frameworks and the MCAS tests can be
Music and Higher Scores on Standardized Testing

In American public schools the common measurement of students achievement is high scores on standardized tests. This speaks to the ample amount of research that highlights a possible correlation in this regard. According to Vitale (2011) the notion that “music makes you smarter” has permeated media campaigns in an effort to increase advocacy for music education programs. In his study that surveyed various stakeholder groups, he found that the perspectives and perceptions of participants are in line with the belief that studying music will make one ‘smarter’ in other academic areas.

Perhaps the most widely quoted statistics in music advocacy campaigns is the information presented on the Scholastic Aptitude Tests (SATs) and student musicians (Vaughn & Winner, SAT Scores of Students Who Study the Arts: What We Can and Cannot Conclude about the Association, 2000). Presented on a yearly basis through the College Board’s group profile report, in the year 2012 it suggested that students who indicated that they participated in music courses scored an average of 23 points above average in math, 31 points above average in reading, and 31 points above average in writing. This statistical analysis of the SATs, a revered indication of student success, gave credence to advocates who sought validation for the benefit of high school music programs. Vaughn and Winner (2000) impress that although the association exists between SAT scores and students with musical backgrounds there are other possible variables that may contribute to this relationship. In his study of students who play a musical instrument and standardized test scores, Babo (2004) controlled for some of these variables including gender, Intelligence Quotient (IQ) and SES. Findings established that music
instruction contributed significantly to the variance in ELA scores even after the previously mentioned variables were taken into account. In a similar study Kinney (2008) also controlled for demographic variables (i.e. SES) in an urban middle school and deduced that sixth and eighth grade band students scored significantly higher than peers who did not play a band instrument. Kinney (2008) also controlled for demographic variables (i.e. SES) in an urban middle school and deduced that sixth and eighth grade band students scored significantly higher than peers who did not play a band instrument.

Many instrumental music programs are scheduled using a ‘pull-out’ or ‘opt-in’ method. This type of scheduling occurs when student musicians are excused from regularly scheduled courses in other academic areas to participate in musical training. With the emphasis on raising student test scores through increased ‘time on learning’ in the traditionally tested subject areas, it is not uncommon for educators, administrators and parents to voice concern over the possible effects of the pull-out model (Hash, 2011). Therefore, the aim of many music studies concerns this question (Thornton, 2013). Overwhelmingly the research suggests that students who are pulled out of class to learn a musical instrument perform better than non-music peers on measures of achievement. Dryden (1992) found that instrumental students received at least equal scores on the Comprehensive Test of Basic Skills with musicians outscoring their peers in the categories of reading and vocabulary. Likewise, Neuharth (2000) examined the effects of a band pullout program for fourth through eighth grade students. After only one year in the music program student test score were significantly higher than those of non-musical peers. Hash (2011) had similar results showing statistically significant differences between band versus non-band students with some categories yielding favorable results for student musicians. He asserted however, that students who choose to participate and persist in the instrumental program may be academically successful prior to electing to join the program. Johnson and Memmott (2006) took a deeper look at the quality of school music programs and the relationship of academic
success. They found that in schools where a high quality music program existed, students scored higher on both ELA and mathematics portions of standardized tests regardless of demographics.

Huber (2009) analyzed the state standardized test scores English language arts of student musicians in grades 6, 7 and 8 in comparison with their non-musical peers and found a statistically significant positive relationship between studying a musical instrument and reading development for this age group. She further found that a significant difference exists between students with more than two years of musical experience and higher ELA test scores. She states that, “evidence implies a true association that intensifies and is sustained over time” (Huber J., 2009, p. 80). Huber also noticed that unlike Fitzpatrick’s (2006) findings, students who play woodwind and brass instruments had higher scores than students who played string instruments. She states that a possible explanation for this discrepancy that was not found in other empirical studies could be attributed to the recruitment process for the community where the study was conducted. In that particular community, students in the third grade are tested using Gordon’s Primary Measures of Musical Audiation (Gordon, n/d) to determine musical aptitude and the higher scoring students are counseled into instruction in band instruments. Thus, a connection between a predisposition for musical aptitude and language development may contribute to the discrepancy in scores. Rounding out this account of a portion of the literature on music participation and standardized test scores, in a review of 24 correlational studies on the topic, Butzlaff (2000) noted “a strong and reliable association between the study of music and performance on standardized reading and verbal tests” (p. 172).

**Neuroscience and Music**

During the past decade, research on the effects of formal music training on cognitive development is more comprehensive and prolific (Miendlarzewska & Trost, 2014). Through
collaborations between scientists, psychologists and music educators this body of work has yielded stronger differences between music education and brain development. Due to the increased use of neuroimaging techniques to study the plasticity, structural differences and processing of both musicians and non-musicians (Miendlarzewska & Trost, 2014) the research community can validate or dispel theories related to auditory processing, cognitive functioning related to music making and how this affects other learning domains. This literature, predominantly experimental in nature, encompasses longitudinal and short-term studies of healthy children and adults across the lifespan as well as individuals with brain related deficiencies. This section of the review will focus on research with child development of language skills and an emphasis on musical instrument instruction.

Performance on a musical instrument requires complex and interconnected skills occurring in tandem. These synchronous skills are reading music notation, adjusting performance based on multisensory feedback from the player and other members of the ensemble, and, employing “bimanual motor activity” rhythmically and within a meter (Miendlarzewska & Trost, 2014). Barrett et al. (2013), concur and add that because musicians are “multi-taskers,” whereas, they are employing auditory, motor, emotional and cognitive processing at the same time, the assumption that their brains would be different from non-musicians is obvious. They cite multiple studies illustrating structural differences in the brains of musicians such as an enlarged auditory cortex (Hodges, 2000), increased gray matter (Gaser & Schlaug, 2003) and changes in gray matter density depending on the brain region (James, Oeschslin, Van DeVille, Hauert, Descloux, & Lazeyras, 2013). These enhancements in the brain remain into adulthood even if the musical training occurred during childhood (Skoe & Kraus, 2012; Skoe & Kraus, 2013). Furthermore, multiple studies contend that the benefits of music
education on cognition can be experienced after only short periods of exposure/experience (Schlaug, Norton, Overy, & Winner, 2005; Hyde, et al., 2009). Schlaug et al. (2005) also note that when they expanded their research to include children who played an instrument for an average of four years, the children had significantly more gray matter and scored significantly higher on measurements such as Gordon’s Intermediate Measures of Music Audiation (Gordon, n/d) and the Vocabulary subtest of the WISC-III than their matched non-musician peers. The two aforementioned studies purport that the structural changes seen in adult musicians are due to musical training (nurture) and not biological predispositions (nature).

While some studies noted differences in the brain structures (Gaser & Schlaug, 2003; Hodges, 2000; Schlaug, Norton, Overy, & Winner, 2005) others found that in the case of musicians, areas of the brain, responded quicker and more consistently to musical and other sound stimuli (Barrett, Ashley, Strait, & Kraus, 2013; Gaab, 2005). Plasticity, the notion that our brains can be modified through our experiences is of particular interest to neuroscientists because of the possible ramifications in treatment or education (Wan & Schlaug, 2010). Music training is ideal for the study of brain plasticity because it is multi modal and akin to the learning of other ‘skills’ it can easily be manipulated to control variables in experimental studies (Wan & Schlaug, 2010). Skoe and Kraus (2013), contend that the brain stem of musicians has a “distinctive neural signature,” (p. 2) and that it occurs because the musical experiences were during “sensitive periods” where brain plasticity is at its height. Exposure to stimuli such as musical training creates and enriching environment which can prolong these sensitive periods permanently altering the brain (Miendlarzewska & Trost, 2014; Bailey & Penhune, 2013).

Kraus and colleagues (Strait, Parbery-Clark, Hittner, & Kraus, 2012; Parbery-Clark, Tierney, Strait, & Kraus, 2012; Strait & Kraus, 2011) indicate through several studies that
auditory processing of speech is affected by musical experiences; the degree of change is proportional to the onset and length of study (Barrett, Ashley, Strait, & Kraus, 2013; Bailey & Penhune, 2013). Researchers focus on the transfer of linguistic skills from music education to the language domain because neural processing is similar or overlaps (Miendlarzewska & Trost, 2014).

In a recent review, Tierney and Kraus (2013) reinforce Patel’s statements and speak to research on music education and the relationship to five functions that are central to reading acquisition: (1) phonological awareness, (2) speech-in-noise perception, (3) rhythm perception, (4) auditory working memory, and (5) sound pattern learning. The first function, phonological awareness, which includes discriminating sounds in speech such as beginning or ending consonants relies on the ability to detect and process frequency and duration quickly. Studies conducted by Anvari et al., (2002) and Forgeard, et al., (2008) showed that there is difference between the ability to perceive pitch and phonemic awareness. Additional studies on music and language include research with people with dyslexia who possess impairment with phonological processing (Gaab et al., 2005). The second language function, the ability to focus attention in order to hear speech through background noise is called “speech-in-noise perception” (Parbery-Clark, Tierney, Strait, & Kraus, 2012, p. 116). This ability is decreased in children with language impairments (Tierney & Kraus, 2013) and increased in musicians (Strait, Parbery-Clark, Hittner, & Kraus, 2012; Strait & Kraus, 2011). Rhythm perception, which includes the ability to notice changes in amplitude, stress on certain syllables and duration of sounds is the third language function supported by research of musical training. Perception of rhythm and synchronicity leads to reading ability and is also at the heart of music and music making. Due to the rhythmic and metrical qualities of music, ongoing experiences in music have been found to
strengthen rhythmic perception (Anvari, et al., 2002; Forgeard, et al., 2008; Moritz et al, 2012).

In an continuing study by Slater, Tierny and Kraus (2013), at-risk elementary children who are involved in an instrumental program called “Harmony Project” were assessed for their ability to tap a beat. The ability to tap a beat has been found to predict reading ability. Even after only one year of instrumental study the group that received the musical instruction could tap the beat significantly better than the control group.

According to Tierney and Kraus (2013), auditory working memory assists in decoding words and phrases to make meaning. It also supports speech as short-term memory for conversation. Auditory working memory is part of the ‘executive function’ cognitive processes that allow us to remain focused (Miendlarzewska & Trost, 2014). It has been found that musicians have superior auditory/verbal working memory because this skill is practiced often through playing or singing alone, in ensembles or in improvisational situations (Chan, Ho, & Cheung, 1996). The last function central to reading acquisition, ‘sound pattern learning,’ occurs when young children are beginning to notice patterns and regularities in sound so that they can better form words. Multiple studies cited in Tierney and Kraus’s review point to the fact that musicians are better able to track patterns in sound because music is replete with auditory patterns (Tierney & Kraus, 2013).

Patel (2011) builds on the neuroimaging studies outlined above that attest that non-linguistic treatments such as music education can enhance the neural encoding of speech and language. He offers the OPERA hypothesis stating that researchers thus far have discovered “how” music enhances language skills yet, his theory answers the question of “why” music enhances language skills. Patel suggests that the following five mechanisms inherent in well-designed musical interventions are the reasons why music and language are strongly linked:
(1) Overlap: there is anatomical overlap in the brain networks that process an acoustic feature used in both music and speech (e.g., waveform periodicity, amplitude envelope),

(2) Precision: music places higher demands on these shared networks than does speech, in terms of the precision of processing, (3) Emotion: the musical activities that engage this network elicit strong positive emotion, (4) Repetition: the musical activities that engage this network are frequently repeated, and (5) Attention: the musical activities that engage this network are associated with focused attention.

(Patel A. D., 2011, p. 1-2)

**Summation**

As evidenced above, ample literature is available to support the further study of the relationship between music instruction and achievement in ELA for middle school aged students. Reaching back to early investigations of the arts and achievement the history of research on this topic is well documented. Longitudinal studies with large sample sizes as well as studies with distinct demographic populations give credence to the correlational aspect of playing a musical instrument and higher student achievement. Although prominent researchers continue to grapple with the question of transfer between domains of learning, the field of neuroscience is contributing greatly to a new stream of research on music and cognitive functioning. This, coupled with investigations of pre-literacy reading skills that correspond to skills learning in music assume a solid theoretical basis for further study of the connection between music instruction and ELA achievement.
Chapter Three: Methodology

Chapter Three outlines the methodology of this study. Included in this chapter is the restatement of the problem and how that connects with the methodology. Restatement of the research questions, description of the site, participants, data collection and analysis procedures are explicitly stated. Lastly, discussion of validity, researcher bias and protection of human subjects is addressed.

Restatement of the Problem

Nationwide, arts education in American schools is on the decline due to the choice to increase time and remediation in ELA, mathematics, and science (McMurrer, 2008) with the aim of increasing student test scores on high stakes tests (Heilig, Cole, & Aguilar, 2010) that are linked to accountability measures for schools districts and even individual educators (Massachusetts Department of Elementary and Secondary Education, 2014). Decision makers at the building level, such as principals, and the district level, such as central office personnel must make value-based decisions about the importance of offering musical instrument instruction when faced with tightening budgets and increasing pressure to raise test scores (Kelly, 2012).

In urban school districts where funding is scarce and test scores are low, opportunities for students to participate in instrumental music classes are disappearing at a faster rate (West, 2012). This fact is even more troubling considering that recent advances in neuroscience research point to the beneficial changes in the brain related to language acquisition through regular, sequential music instruction (Moreno, Friesen, & Bialystok, 2011; Kraus, Hornickel, Slater, Thompson, & Strait, 2014). The effect of music instruction on language development is significant for at-risk students (Kraus, Hornickel, Slater, Thompson, & Strait, 2014), suggesting that at-risk students who have regular participation in instrumental music instruction may
produce higher achievement on standardized tests in ELA.

The purpose of this study is to understand how playing a musical instrument for five consecutive years relates to measures of literacy achievement for urban middle school students. Furthermore, do the perceptions of educators and administrators about this topic affect value-based decisions regarding resource allocation and opportunity for students in an urban public school. A case study (Yin, 2014) of phenomena involving the instrumental music program for eighth grade in an urban school district was the overarching method for this study. This was accomplished in two phases, first by investigating the ELA achievement of eighth grade musicians in an ‘underperforming’ urban district, on standardized assessment measures of literacy. The study examined possible differences in this sample that have been found previously in the literature. Statistical tests done on secondary data analysis (Boslaugh, 2007) yielded quantitative data that was used in the second phase of the study. Educator and administrator perceptions about these findings were elicited through focus groups with the aim of uncovering perceptions about the value placed on instrumental music classes.

Although studies have been previously conducted on literacy achievement and student musicians, this study is unique in two ways. First, the methodology that it employed with a qualitative measurement that informs a qualitative investigation of perceptions has yet to be conducted. Second, the ‘case’ that was studied is unique because it is counter to trends in the research (i.e. resources are increasing for instrumental classes rather than decreasing). Moreover, this district provides a high percentage of the students with free instruments thus eliminating economic barriers to participation for disadvantaged youth.

The research employed a postpositivist interpretive framework, “… whereas the postpositivists argue that reality can never be fully apprehended, only approximated.” (Denzin &
Lincoln, 2000, p. 9). This framework was especially appropriate for the study that used both qualitative and quantitative methods, because as Denzin and Lincoln (2000), continue, “Postpositivism relies on the multiple methods as a way of capturing as much of reality as possible” (p. 9). Creswell (2013) similarly offers, “postpositivists researchers view inquiry as a series of logically related steps, believe in multiple perspectives from participants rather than a single reality and espouse rigorous methods of qualitative data collection and analysis” (p. 24).

Couching quantitative data within a qualitative research framework was appropriate for this study for many reasons. Creswell (2009) provides several characteristics of qualitative research that apply to this study including: “researcher as key instrument,” “multiple sources of data,” “inductive data analysis,” and, “participant meanings” (p. 175). In reference to the researcher as the key instrument, Creswell (2009) infers that when conducting qualitative research, it is the researcher who is personally collecting and analyzing data. Although multiple sources of data may be collected, as is the case with the study, the researcher is of primary importance. Furthermore, the researcher uses an inductive process to analyze the data and identify emerging patterns and themes. Lastly, regarding “participants’ meanings,” Creswell posits that, “in the entire qualitative research process, the researchers keeps a focus on learning the meaning that the participants hold about the problem or issue” (p. 175). This is especially true of the study because the research questions in Phase Two explored the perceptions and values of educators and administrators. Moreover, the use of a single case study methodology is appropriate because according to Yin (2014) this case is uncommon in the sense that many instrumental students receive free instruments and lessons as well as the fact that access to instrumental instruction runs counter to nationwide trends. The following chapter further details the methodology for the study as well as provides a rationale for this methodology.
Research Questions

A. The main question that guided this research was:

How does playing an instrument for five or more consecutive years affect the literacy achievement of middle school students in an urban public school?

B. Sub-questions to probe deeper into this topic include:

- How do educators’ (i.e. music teachers, ELA teachers and administrators) perceptions of the value of music education change (or remain the same), when presented with quantitative data on playing an instrument and students’ literacy achievement?

- To what end do these perceptions affect value-based decisions on the part of administrators and educators about students’ access and equity concerning instrumental music instruction in public schools?

Research Design

The study employed case study as the overarching methodological research design. In the Phase One, statistical tests were applied to data on student tests of literacy that were previously collected and housed in the Massachusetts Department of Elementary and Secondary Education (MADESE) Department’s Data Warehouse. Phase Two of the investigation occurred in present day to elicit the most current perspectives of participants.

In the most recent edition of Yin’s (2014) book on the topic he provides a twofold definition of a case study. He notes that this improved definition is the most current and comprehensive:

1. A case study is an empirical inquiry that
• investigates a contemporary phenomenon (the ‘case’) in depth and within its real-world context, especially when
• the boundaries between phenomenon and context may not be clearly evident.

2. A case study inquiry
• copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as a result
• relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result
• benefits from the prior development of theoretical propositions to guide collection and analysis.

(Yin, 2014, p. 16-17)

In addition to meeting many of the criteria above, there are several reasons why a case study was appropriate for the research study. According to Yin (2014) “how” and “why” questions are best explored through a case study methodology. Consequently, investigating “How playing an instrument affects the literacy achievement of middle school students” and sub-questions posed in the study are in line with this rationale. Merriam (1988) notes that the amount of control that a researcher has on manipulating variables in a study factors into the methodology design. She states that a case study is appropriate when the researcher has little control (Merriam, 1988). Yin (2014) adds that although both case studies and histories can be chosen when there is little control, case study is most appropriate when the study pertains to contemporary issues of today or the immediate recent past. He further submits that a case study is suitable when the questions seek to explain possible casual links in real-world interventions that contain complexities beyond what an experiment or survey can practically investigate (Yin,
2014). Case studies elicit the viewpoints of the participants. (Tellis, 1997) The study accomplishes this by collecting and synthesizing participant responses to relevant, district-derived data on the topic.

To achieve a comprehensive account of the investigation, within the overarching case study design there are two phases. Phase One draws from quantitative strategies aimed at understanding the possible statistical relationship between students’ test scores on measures of literacy and participation in instrumental music classes. Independent t-tests on score reports MCAS were analyzed to examine possible relationships between test scores and regular participation in instrumental classes.

In Phase Two this data was presented to focus groups of educators (i.e. administrators, ELA and music). Questions were designed to ascertain perceptions about these preliminary findings (Appendix F). The objective of these focus groups were to better understand how value-based decisions are made at this site concerning resource allocation and scheduling for instrumental music classes. In collecting and analyzing multiple sources of evidence, the case study possesses greater validity and is more generalizable (Tellis, 1997).

**Research Site**

The site of this study was an urban school district of approximately 12,500 students. In 2014 many of the students fell into the ‘at risk’ category with 75% considered low-income, 55% minority, 5% English Language Learners (ELL), 22% had a first language that was not English and 22% were students with disabilities (Massachusetts Department of Elementary and Secondary Education, 2014). The student data was collected from only eighth grade students. The eighth grade was a class of about 790 students across three middle schools. All three middle schools had similar course offerings, scheduling, demographics and other attributes that might
affect validity.

Regarding instrumental music instruction at this site, all students were offered free instrumental instruction during school and a lottery for free instruments (approximately 350 instruments were available) in the fourth grade. Students could also choose to rent or buy their instrument and receive free instrumental lessons. Students who persisted in the instrumental music program could continue to use a school owned instrument and participate in free lessons in the fifth grade and band class in grades six, seven and eight. All music teachers in the school district were certified by the Massachusetts Department of Elementary and Secondary Education (MADESE). Students were taught a rigorous curriculum that progresses sequentially and builds on prior knowledge from one year to the next. Students were expected to practice outside of the school day to gain proficiency. Students exhibited this proficiency through assessments of skill on their instruments and through public performances as an ensemble.

Focus groups were conducted in one of the middle school buildings and the administration building. Representation from across the district was sought. The physical location of the room helped to maintain confidentiality by being secure and private. As suggested by Yin (2013), the case study must be clearly defined units of analysis; they need to be “bounded” which delineates who is in the study. The phenomenon being studied must be defined and defined any data that is external to the study is considered context.

Participants

In Phase One, student participants in this study regarding standardized test scores were all eighth grade students in the district during the school year 2013-2014. There are approximately 790 students who were in the eighth grade that year. This year was chosen because standardized test scores on MCAS and PARCC exams were not released to the district in a timely manner and
therefore the tests from school year 2014-2015 were not be available until January 2016. Student data was designated “instrumental student” if students were continually enrolled in the district from grades 4-8 and participated in instrumental music class during the entire five years. All other students were designated, non-instrumental students. To determine difference, eight t-tests were applied to the data.

In Phase Two, focus group participants were educators and administrators who were currently employed for this school district or who were employed during the past school year. All participants were certified by MA DESE to teach or supervise in their content area for their designated grade. Participation was voluntary.

**Recruitment and Access**

Upon gaining approval from the Northeastern University Institutional Review Board’s (IRB) (Appendix A) and the Superintendent of Schools for the district (Appendix B), recruitment of participants began. As stated below, building principals were recruited to participate in the focus groups. Regardless of their choice to participate, these administrators and central office administration were given information on the purpose of the study, data collection methods and analysis as well as potential findings and recommendations upon completion of the study. Due to the need to maintain confidentiality for participants involved in focus groups and survey respondents, administrators did not have access to raw data that may identify individual participants.

In Phase One permission from the Superintendent of Schools was received to collect and analyze selected MCAS test data pertaining to students test scores. This data has already been collected by the school district as part of the MA DESE Edwin Analytics Data Warehouse. The researcher was given access to it in an excel spreadsheet for the purpose of de-identifying the
students (i.e. students names and ID numbers were replaced with new numbers). The researcher
in her former job capacity had permission to do this, as all MCAS data was available to her for
program improvement efforts. Due to the fact that standardized test data from school year 2013-
2014 must be utilized, it would be very difficult to obtain permission from individual students.
This is because many students exercise their option to attend high schools other than the district
high school (e.g. charter, vocational, agricultural, private/parochial). Tracking down each of
these students is a cumbersome task and may severely reduce the sample size.

In Phase Two, a “Call for Participants” (CfP) (Appendix C) was issued to garner participants for focus group participation. This CfP described the purpose of the study and participant criteria for selection. It provided potential participants assurance that involvement is voluntary and they may withdraw from the study at any time for any reason. When they chose to participate, each individual signed an “Informed Consent Form” (ICF) (Appendix D), which further detailed the above assurances. The ICF also explained how steps were taken to ensure their safety, anonymity and confidentiality of their responses.

Focus group participants were recruited via electronic mail. In addition, personal invitations from the researcher to key individuals in each category were delivered. Examples of key individuals were the three middle school principals and the three instrumental music teachers at the middle school level. As an administrator in the district for over a decade, the researcher had access to all of these individuals and was confident that the appropriate representation could be obtained.

Data Collection

This study was conducted in two phases so that multiple forms of data could be collected which strengthened the overall investigation. (Yin, 2014; Tellis, 1997; Creswell J. W., 2009) In
Phase One, data was collected from student scores on Eighth Grade MCAS for English Language Arts. This MCAS data was collected through electronically stored student records in the MA DESE Data Warehouse/ Edwin Analytics on-line repository. It was downloaded into a Microsoft Excel workbook where outliers and anomalies were identified. District-level information technology software ipass and Aspen X2 was utilized to retrieve student records to verify participation in instrumental music classes through this scheduling software. The student data was re-coded to identify instrumental and non-instrumental groups. The following breakdown of the scores was analyzed: question types (i.e. multiple choice, open response), standards addressed in the questions (i.e. Craft and Structure, Key Ideas and Details, Vocabulary Acquisition and Use), ways to score the assessment (i.e. scaled score, percent correct, student growth percentile). Histograms illustrating frequency distribution (Appendix I) will be constructed to test for normality. Re-coded student data was uploaded into SPSS software for analysis using Levene’s Test for Equality of Variances and a t-test for independent measures.

Denzin and Lincoln (2000) state, “…Qualitative investigators think they can get closer to the actor’s perspective through detailed interviewing and observation” (p. 10). In Phase Two, the researcher pursued this end through data collection that is primarily in the form of information recorded through focus groups and interviews. This included both quantitative and qualitative information. A background questionnaire was administered prior to the start of the focus group. These prompts did not ask individuals to identify with their name. Questions on this written form included information on the number of years that participants have been teaching in the district or elsewhere, their personal experience playing a musical instrument and/or if a close family member or friend played a musical instrument, and their identification with one or more of the ‘at-risk’ subgroups present in an urban public school setting. Both
demographic and follow-up questions were piloted with at least one educator from each discipline and an administrator who is not involved in the study to ensure that questions were worded clearly.

During semi-structured focus groups of educators and middle school administrators, qualitative data was collected based on participant responses. Mertens (1998) suggests a semi-structured set of five to seven questions as a, “…way to ensure coverage of important issues yet allow for flexibility in responding to group-initiated concerns” (p. 321). Mertens (1998) adds that a benefit of collecting data through focus groups is that the interaction of participants can garner insightful ideas that might not be generated in a single interview or through the use of a questionnaire. Sample questions are provided in Appendix E.

The researcher followed an interview protocol as suggested by Creswell (2009) that includes statements of norms for participants, semi-structured scripted questions, probing questions, time to record participant responses (including consensus or disagreement on the response) and closing remarks of appreciation. During the focus group responses were recorded on an evidence sheet that denotes the date, time and type of participants. Audio from focus groups and interviews were recorded for the purpose of secondary analysis.

Data Storage

Data was collected through both digital and handwritten means. All handwritten notes were kept in a single folder in a secure location at the researcher’s residence. Digital records, including audio files, were kept on the researcher’s personal, password protected, and laptop were transferred to a secure hard drive upon completion of the dissertation. All focus group participants and interviewees were provided pseudonyms to help maintain anonymity. All data
will be kept for five years after the completion of the study. Upon that time, the files will be shredded and destroyed.

**Data Analysis**

Merriam (1998) states that data collection and analysis occur simultaneously in a qualitative case study because, “Emerging insights…direct the next phase of data collection, which in turn leads to refinement or reformulation of one’s questions” (p. 119). Yin (2014) suggests multiple ways to analyze qualitative case study data. In a case study because the researcher is the primary instrument, the qualitative researcher needs to become intimately familiar with the data (Warren & Karner, 2005). This study employed an inductive analytic strategy of “working the data from the ground up” (Yin, 2014, p. 136). In using this strategy the researcher attempted to identify patterns and trends in the data that pointed to relevant connections. An “analytic path” (Yin, 2014) began to emerge as key concepts were threaded together and additional associations are uncovered. Pattern matching was also used as an analytic strategy. Yin (2014) states that the technique of pattern-matching, compares a predicted pattern based on previous literature with an empirically based pattern from the current case study for the purpose of strengthening internal validity.

The researcher analyzed qualitative data through the process of coding. Saldaña (2009) suggests that the coding process is cyclical. It is an iterative process of consideration and reconsideration of the data. He further posits, “Coding is only the initial step toward an even more rigorous and evocative analysis and interpretation for a report. Coding is not just labeling, it is linking,” (Saldaña, 2009, p. 3). To prepare for coding the researcher listened to the audio recordings and read each transcript many times prior to creating a set of working codes to distill and organize the data. The qualitative software Max QDA was chosen to organize and analyze
the data. Once transcripts were uploaded into Max QDA the task of first cycle coding began through selection of transcript passages and assignment of codes.

“Initial coding” as described by Saldaña (2009, p. 81) “is breaking down qualitative data into discreet parts, closely examining them, and comparing them for similarities and differences.” This coding was conducted on each focus group transcript separately. As new themes emerged they were added to the set of working codes. Transcripts were re-coded at least two more times to incorporate new themes that emerged. “Simultaneous coding” (Saldaña, 2009, p. 62) was also used for data that pertained to multiple codes at the same time. In the second cycle coding, the connection to specific codes was weighted so that the overlapping of code assignments was reduced.

Saldaña (2009) proposes, “Rarely is the first cycle of coding data perfectly attempted. The second cycle (and possibly the third and fourth, and so on) of recoding further manages, filters, highlights, and focuses the salient features of the qualitative data record for generating categories, themes, and concepts, grasping meaning, and/or building theory,” (p. 8). As a second cycle coding method the researcher reorganized, condensed and collapsed sub-categories to finalize a set of coded themes. One of the specific methods used in the second cycle is “values coding” because it aligned closely with the sub-questions pertaining to the perceptions, beliefs and values of educators in the studied school district. Saldaña (2009) defines values coding as, “the application of codes and qualitative data that reflects the participants values, attitudes, and beliefs, representing his or her perspective or worldview” (p. 89).

In addition to the background questionnaire (Appendix F) qualitative data was collected through a series of focus groups. The focus groups were audio recorded and the researcher or confidential designee transcribed all comments. First cycle coding was attained through the use
of Max QDA software whereas each group was coded individually and then cross-coded to look for patterns, trends, similarities and differences. Second cycle coding occurred to further refine themes and prepare findings.

Prior to gathering qualitative data in Phase Two, a quantitative strategy of analysis must first be employed so that statistical measurements can be realized. Therefore, in Phase One, a t-test was utilized as a test for statistical significance for eighth grade ELA MCAS scores for instrumental music students compared to non-instrumental music students. The level of significance was set to a Type 1 error rate of .05. Trochim (2006) states, “This analysis is appropriate whenever you want to compare the two means of the two groups.” He further explains that this measurement employs a formula that is a “signal-to-noise metaphor in research: the difference between the means is the signal that, in this case, we think our program or treatment introduced into the data: the bottom part of the formula is a measure of variability that is essentially noise that may make it harder to see the group difference” (2006, p. 1). Even though it was expected that the instrumental group sample would be smaller than the non-instrumental group, the sample size met the minimum criteria to utilize a t-test. Levene’s Test for Equality of Variances was used and distributions run on the data to ensure that the t-tests are reliable measurements of these group differences.

In addition to the analytic strategy mentioned above, the researcher also employed organizational techniques suggested by Yin (2014) that strengthened the reliability of the study. These included maintaining a database of all data that is organized by data type and source and constructing a “chain of evidence” that allowed for a chronological through-line from initial questions to conclusions.
Trustworthiness

Producing valid and reliable analysis is the intention of all quality research (Merriam, 1988; Creswell J. W., 2009). Whereas quantitative studies with experimental designs can factor a degree of validity and reliability through the design at the outset, qualitative methodology can also ensure that quality is upheld through multiple measures of trustworthiness (Creswell J. W., 2009; Creswell J. W., 2009; Merriam, 1988; Yin, 2014). The methods that were applied to ensure trustworthiness in this study are: triangulation, member checking, and presenting thick, rich descriptions in addition to clarifying researcher bias. Each of these are described below:

**Triangulation:** is a tool that illustrates the convergence of lines of inquiry for the purpose of strengthening validity of the study (Creswell J. W., 2009). In the study triangulation was achieved through the use of multiple data sources, collection and analysis methods. In Phase One multiple scoring reports of the MCAS test is an example of triangulation. The triangulation in Phase Two consists of a variety of viewpoints from stakeholders. Using all of these data points for the case study is the third example of triangulation.

**Member Checking:** is a quality control tool that assists with ensuring accuracy (Merriam, 1988). As suggested by Creswell (2009), transcripts of focus groups, sections of the draft report, as opposed to raw data, were presented to members of the focus groups to determine if the representations are accurate. It may also include a follow up interview. Overall, member checking provides an opportunity for participants to comment on the findings prior to the final report.
Thick, Rich Description: is used as a writing tool when researchers provide layers of detail in an effort to transport the reader to the setting or provide multiple perspectives (Creswell J. W., 2009). This adds validity and generalizability to the findings (Merriam, 1988).

Clarifying Researcher Bias: allows for transparency on the part of the researcher thus providing a level of comfort on the part of the reader. Creswell mentions that this “self-reflection creates an open and honest narrative…” (2009, p. 192). Furthermore, the quantitative aspect of this study leaves no room for subjectivity. Throughout the process of focus groups that yielded qualitative data, careful attention was paid to ensure that researcher bias was not present in facilitating the focus groups or analyzing the data. As Creswell (2009) states, when a researcher studies his/ her own organization or immediate work setting, this “backyard research” (p. 177) can be compromised if multiple strategies of validity are not employed to “create reader confidence in the accuracy of the findings” (p. 177).

Threats to Internal Validity and Credibility

Lincoln and Guba (2000) state that there are “parallel criteria” whereas quantitative and qualitative research methods are designed to achieve similar ends. For quantitative measurements such as in Phase One of this study, the parallel criterion being referenced is internal validity. For qualitative measurements like in Phase Two of this study, a similar construct is called credibility although it should be noted that these parallel criteria do not accomplish the exact same objectives (Morrow, 2005). Each will be discussed in reference to the appropriate phase below. Due to the design of this study and access to the data, in Phase One it was not possible to randomly assign students to a control group or an experimental group. It was also not possible to match students based on demographics because that detail of data was
not available. In this school district however, all students had the opportunity to play a musical instrument regardless of financial ability. Band instrument lessons began in 4th grade through a lottery system for free instrument loan and free during-school weekly lessons. The scores of all eighth grade students cannot be part of this study due to the fact that not all have been continuously enrolled in the district from grade four through eight. Scores from students who participated in instrumental lessons for any part of their middle school career were also disqualified because this profile creates a third group of students who did not fall into the instrumental music or non-instrumental music group.

As stated above, in Phase Two, focus groups were comprised of educators and administrators from the district. These groups were designed to provide a setting where individuals feel comfortable voicing their thoughts on the topic. This included the purposeful composition of these groups based on job-description (i.e. ELA teachers in a separate group from music teachers) and assurances that individuals with supervisory capacity over other participants are not grouped together in the same focus group.

**Protection of Human Subjects**

The confidentiality of all participants is of utmost importance. Measures were in place to maintain this confidentiality at every step of the process. After students were identified based on their participation in band for five years, each were assigned a number so that all students’ names were absent from further analysis. No student, educator, administrator or group of such was named directly in the study nor were their responses, standardized test scores or participation in music ensembles classes shared. For the purpose of the study, the actual name of the schools and school district were replaced with pseudonyms. In the discussion of findings, quotations were only identified in reference to the type of educator (i.e. administrator, music educator, ELA
Summation

In summary, a case study design was appropriate for the research study for many reasons including the uniqueness of the case and the contemporary topic. More importantly, case study methodology produced data and analysis that provided emergent themes that speak to the research questions. By conducting the study in two distinct phases, whereas relevant quantitative data laid the foundation for rich discussions about perceptions and value based decisions, it was surmised that the findings of the study greatly add to the field.
Chapter Four: Summary of Findings

There is a well-documented trend in American schools regarding the decline of music education programs. In an era of high-stakes standardized testing and dwindling resources, some posit that this waning in music education is a direct result of value based decisions that place importance on tested subjects such as English language arts, mathematics and science. Due to the fact that consequences or accolades are given to schools based solely on the level of students test scores, the tendency to fund programs directly related to subjects that are tested is credible. There is growing evidence in the research community that experiences in music, especially instrumental music, can bolster one’s ability in literacy. Most notably through the use of advances in neuroscience, brain research is fueling increased understanding of the effect of playing a music instrument on literacy areas of the brain.

With this in mind, the purpose of this study was to understand how playing a musical instrument for five consecutive years relates to measures of literacy achievement for urban, middle school students. This was achieved through a case study of an urban, public school district that provides hundreds of free musical instruments to students thus, curtailing the barrier of obtaining an instrument as a requirement of participation. The study occurred in two phases with the first consisting of an analysis of student test score data. The second phase involved three focus groups of educators from this urban district. The intent of the focus groups was to investigate the perceptions, and beliefs of educators on this topic and how those affect value-based decisions regarding resource allocation and opportunity for students in urban public schools.

Research Questions

A. The central question that guided this research was:
How does playing an instrument for five or more consecutive years affect the literacy achievement of middle school students in an urban public school?

B. The sub-questions to probe deeper into this topic included:

• How do educators’ (i.e. music teachers, ELA teachers and administrators) perceptions of the value of music education change (or remain the same), when presented with quantitative data on playing an instrument and students’ literacy achievement?

• To what end do these perceptions affect value-based decisions on the part of administrators and educators about students’ access and equity concerning instrumental music instruction in public schools?

Methodology

The overarching methodological research design for this study was a case study because the researcher investigated phenomenon in a single urban, public school district in relation to the research questions. As a case study it employed both quantitative and qualitative data and analysis methods. According to Yin (2014) this is appropriate in a case study because a case study “relies on multiple sources of evidence, with data needing to converge in a triangulating fashion” (p. 17). He further attests that a case study is suitable when the questions seek to explain possible casual links in real-world interventions that contain complexities beyond what an experiment or survey can practically investigate (Yin, 2014). Furthermore, a case study was chosen because the researcher is attempting to elicit the viewpoints of the participants (Tellis, 1997).

To accomplish this, the study occurred in two phases by collecting and synthesizing participant responses to relevant, district-derived data on the topic. In the Phase One, the data
was previously collected and housed in the Massachusetts Department of Elementary and Secondary Education (MADESE) Edwin Analytics Data Warehouse. Boslaugh (2007) considers this type of data, “secondary data” because it was collected previously for an alternate purpose.

Phase One drew from quantitative strategies aimed at understanding the statistical difference between the literacy test scores of students who played an instrument for five consecutive years (instrumental group) and those who did not (non-instrumental group). Students in the non-instrumental group may have played a musical instrument at some point in their educational careers but did not complete five consecutive years. It is also important to realize that due to limitations in obtaining detailed data form the district, there could have been other extraneous variables that may have contributed to the results. Additionally, the groups could not be matched for demographics such as SES, special education and other high needs indicators that could have mitigated the concern of pre-existing differences between the two groups. Therefore, caution should be exercised in interpreting the results from Phase One data.

A t-test was used to analyze the scores of the 2014 Eighth Grade English Language Arts (ELA) Massachusetts Comprehensive Assessment System (MCAS) for the district. The level of significance was set to a Type 1 error rate of 0.05. ELA MCAS test scores were analyzed through eight t-tests that detailed the following types of scoring - percent correct, scaled score, and student growth percentile. The scores were also analyzed through t-tests disaggregated by question types, (i.e. multiple choice, open response), and the specific literacy standards addressed in the questions (i.e. craft and structure, key ideas and details, vocabulary acquisition and use).

Group sizes were unbalanced with the instrumental group (n=86) being much smaller than the non-instrumental (n=696). Although small, the instrumental group size was large
enough to meet that requirement for a t-test. Distribution histograms were graphed to ascertain if a normal distribution was present. In many cases this was the case but in some instances the instrumental group was skewed due to the higher than average distribution of scores. Distributions for all eight t-tests are included in Appendix I. To meet the assumption that there is “homogeneity of variance” (Lund & Lund, 2013), Levene’s Test for Equality of Variances was conducted prior to the independent t-test and factored into the interpretation of the results. As was stated with the possibility of extraneous variables affecting the achievement scores initially, the unbalanced nature of the groups and skewed distributions should also be considered when interpreting this data. Similar to the caution expressed by previous researchers about the possibility of other factors affecting the results of statistical tests (Winner & Cooper, 2000) it is important to note that it is not the intent of the researcher to prove causation but rather to discuss a potential relationship between playing a musical instrument and achievement in literacy. The eight t-tests are discussed in detail below.

Phase Two of the investigation involved a series of focus groups with teachers and administrators designed to elicit the perspectives of these groups. Perceptions, beliefs and values were discussed in general, pertaining to instrumental study and the difference to literacy achievement. Also discussed were participants’ reaction to the analyzed statistical data from the district. The intent of collecting and analyzing multiple sources of evidence is that the case study will possess greater validity and be more generalizable (Tellis, 1997).

Research Site

The site of this study is an urban school district of approximately 12,500 students. The demographics of these students are discussed in the participant section below. It is important to note that the district enrollment includes high numbers of students classified as ‘at-risk.’ This
classification includes indicators such as low income/low socio-economic status (low-SES), having disabilities, being from a minority race/ethnicity and having poor attendance. All eligible scores eight-grade students during the 2013-2014 school year from all three middle schools were analyzed. All three middle schools have similar course offerings, scheduling, demographics and other attributes that might affect validity.

Regarding instrumental music instruction at this site, all students are offered the opportunity to participate in free instrumental instruction during the school day in grades 4-12. To provide equity and access for students of low-SES, students can rent, buy or borrow their instrument through a free instrument lottery in the fourth grade. There are approximately 250 instruments offered as part of the fourth grade lottery but the interest routinely outpaces the need. Students who persist in the instrumental music program can continue to use a free school owned instrument throughout their education.

Focus groups were conducted with educators from the district who could speak about their thoughts, experiences, perceptions, beliefs and values concerning students who play a musical instrument versus those who do not. Once sanctioned by the upper administration and a middle school principal, these focus groups were held at locations deemed to be convenient by the participants. The physical location of the room helped to maintain confidentiality by being secure and private. The actual location included two conference rooms and a curriculum office on the grounds of a middle school and the central administration building. All participants had previously been in the location of their focus group many times which added to the comfort level.
Participants

**Phase one participants.** The Phase One participants were 782 eighth grade students who were in one of three middle schools in the district during the school year 2013-2014. The individual identity of these students remains completely anonymous. Students were designated “instrumental student” if he/she was continually enrolled in the studied district from grades 4-8 and participated in instrumental music class during the entire five years. All other students were designated, “non-instrumental student.” Some students were exempted from the analysis if they did not take the standard MCAS exam that year or had incomplete recorded scores on the eighth grade ELA MCAS.

The ethnicity and socio-economic status of the students is similar to many urban centers whereas there is higher than state average incidences of low income and minority status. Table 4.1 is presented to illustrate these demographics for this group of students. It was not possible to obtain data specific to only the eighth grade class during the 2013-2014 school year but middle school (i.e. grade 6-8) and district (grades PK-12) demographics are provided.
Table 4.1 Student demographic indicators for school year 2013-2014

<table>
<thead>
<tr>
<th>Indicator</th>
<th>West MS</th>
<th>North MS</th>
<th>South MS</th>
<th>Average (for MS)</th>
<th>New Boston district (all grades)</th>
<th>MA State (all grades)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student enrollment (grade 8 only)</td>
<td>337</td>
<td>371</td>
<td>268</td>
<td>325</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Student enrollment (all grades)</td>
<td>818</td>
<td>1,059</td>
<td>783</td>
<td>887</td>
<td>12,616</td>
<td>954,773</td>
</tr>
<tr>
<td>% minority (all grades 6-8)</td>
<td>56.0%</td>
<td>39.8%</td>
<td>55.6%</td>
<td>50.4%</td>
<td>50.8%</td>
<td>34.0 %</td>
</tr>
<tr>
<td>% Absent 10 or more days (all grades 6-8)</td>
<td>40.7</td>
<td>38.5%</td>
<td>36.6%</td>
<td>38.6 %</td>
<td>38.0%</td>
<td>31.7%</td>
</tr>
<tr>
<td>% First Language not English (all grades 6-8)</td>
<td>18.5%</td>
<td>17.8%</td>
<td>40.7%</td>
<td>25.6%</td>
<td>21.6%</td>
<td>17.3 %</td>
</tr>
<tr>
<td>% English Language Learner (all grades 6-8)</td>
<td>0.1%</td>
<td>0.1%</td>
<td>15.5%</td>
<td>5.2%</td>
<td>4.6%</td>
<td>7.7%</td>
</tr>
<tr>
<td>% Students with Disabilities (all grades 6-8)</td>
<td>20.3%</td>
<td>21.6%</td>
<td>19.9%</td>
<td>20.6%</td>
<td>22.2%</td>
<td>17.0%</td>
</tr>
<tr>
<td>% Free lunch (all grades 6-8)</td>
<td>70.5%</td>
<td>57.9%</td>
<td>80.5%</td>
<td>69.6%</td>
<td>67.1%</td>
<td>32.1%</td>
</tr>
<tr>
<td>% Low income (all grades 6-8)</td>
<td>77.0%</td>
<td>66.7%</td>
<td>86.1%</td>
<td>74.7%</td>
<td>73.4%</td>
<td>47.0%</td>
</tr>
<tr>
<td>% High Needs (all grades 6-8)</td>
<td>80.3%</td>
<td>73.1</td>
<td>89.1%</td>
<td>80.8%</td>
<td>78.6%</td>
<td>47.9%</td>
</tr>
</tbody>
</table>

Source: (Massachusetts Department of Elementary and Secondary Education, 2016)

**Phase two participants.** In Phase Two there were thirteen participants in three different focus groups. All participants completed a background questionnaire designed to give further insight into comments during the focus group. Characteristics of individual participants are not identified however; averages and generalizations about each group culled from these
questionnaires and comments are described below. Focus groups were open to any educator from the district that volunteered and met the criteria of that specific focus group. The criteria were that he/she held licensure in Massachusetts and had experience teaching grades 4-8 in the subject (ELA, music) or field (administration) for the specific focus group. Groups were intentionally separated to allow for authentic responses. All members in a specific group were familiar with each other thus; there was ease of communication that would not be present if participants were meeting for the first time.

**English language arts focus group participants.** The English Language Arts Educator Focus Group had four participants with an average of 16 years of teaching experience ranging from 6.5 to 23 years. Background demographics for this group are presented in Table 4.2. All indicated that they had attained a masters level degree. One out of four teachers taught exclusively in the studied district, two taught predominantly in the district during their career while the last was new to the district. Each was currently involved in teaching English language arts as a classroom teacher, special education co-teacher or curriculum administrator at the middle school level. Three had taught at other levels (i.e. elementary or high school) and in other capacities (i.e. as a bi-lingual educator). When asked, “As a child, would you identify with any of the ‘at-risk’ demographic groups that are being explored in this study (i.e. low-SES, ELL and/or minority)” one of the four identified as low-SES in childhood and another said that she was an ELL as a young student.

Only one out of four had ever studied a musical instrument and that participant only played for one year as a child. All four participants indicated on the background questionnaire that someone in their family learned how to play a musical instrument and some indicated a high level of musicianship of that family member. Each referenced their family members often in
their comments during the focus group. For participants who were parents, they often referenced their children’s musical experiences playing an instrument as well as that of their other immediate family members.

Table 4.2 Background Questionnaire Information: ELA Educator Participants

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>ELA #1</th>
<th>ELA #2</th>
<th>ELA #3</th>
<th>ELA #4</th>
<th>ELA EDUCATOR TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>How long have you been a teacher/administrator in this district?</td>
<td>11 years</td>
<td>23 years</td>
<td>15 years</td>
<td>.5 year</td>
<td>12 years average teaching in district.</td>
</tr>
<tr>
<td>Did you serve in this capacity prior to being employed in this district?</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>1/4 only taught in district</td>
</tr>
<tr>
<td>Total number of years teaching</td>
<td>18 years</td>
<td>23 years</td>
<td>16 years</td>
<td>6.5 years</td>
<td>16 years average: total years teaching</td>
</tr>
<tr>
<td>Have you ever participated in an instrumental music program?</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>1/4 played an instrument</td>
</tr>
<tr>
<td>Has anyone in your family or immediate circle of friends ever participated in an instrumental music program?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>4/4 family or close friends played an instrument.</td>
</tr>
<tr>
<td>As a child, would you identify with any of the “at-risk” demographic groups that are being explored in this study (low-SES, ELL and/or minority)?</td>
<td>Yes, ELL</td>
<td>No</td>
<td>No</td>
<td>Yes, Low-SES</td>
<td>1/4 Low-SES</td>
</tr>
</tbody>
</table>

Music focus group participants. Six educators participated in the Music Educator Focus Group. Background demographics for this group are presented in Table 4.3. Their collective teaching experience averaged seven years with a range of 1 to 9 years experience. Four out of six only taught in the studied district while two others previously taught in different districts. All taught music at some point for grades 4-8. One was currently a curriculum administrator, one
currently taught at the high school level, two were teaching at the middle school level and two were currently teaching at the elementary level. As a highly qualified music educator, the license encompasses grades K-12 for the teaching of instrumental music, choral music or general music studies. Most taught these various types of music instruction at some point in their career yet, all taught instrumental music. Only one music educator in this group has attained a masters degree while four more are in the process of attaining a masters. Two participants indicated that they grew up in the mid to low-SES and one also indicated that he was an ELL as a child.

Predictably, all music educators indicated that they were involved in an instrumental music program where they learned how to play an instrument. All but one experienced instrumental instruction through an elementary/secondary school based program. Many indicated that they play multiple instruments. All also communicated that they had family and close friends who learned how to play musical instruments. Many commented on the fact that many of their family members play instruments stating, “All very musical,” “Most of my family has performed in one way or another in various ensembles…” and, “My father, sister, brother-in-law, fiancé, etc….it is a whole family affair.” This group often referenced their own direct experiences with playing a musical instrument rather than those of their family members. Two of the participants were parents of young children; none of the participants in their group have children of school age or older in their immediate families so that reference could not be made.
Table 4.3 Background Questionnaire Information: Music Educator Participants

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>MUSIC #1</th>
<th>MUSIC #2</th>
<th>MUSIC #3</th>
<th>MUSIC #4</th>
<th>MUSIC #5</th>
<th>MUSIC #6</th>
<th>MUSIC EDUCATOR TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>How long have you been a teacher/administrator in this district?</td>
<td>8 years</td>
<td>7 years</td>
<td>5 years</td>
<td>1 year</td>
<td>1.5 years</td>
<td>6 years</td>
<td>5 years</td>
</tr>
<tr>
<td>Did you serve in this capacity prior to being employed in this district?</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>4/6 only taught in district</td>
</tr>
<tr>
<td>Total number of years teaching</td>
<td>9 years</td>
<td>7 years</td>
<td>5 years</td>
<td>1 years</td>
<td>6.5 years</td>
<td>6 years</td>
<td>7 years average: total years teaching</td>
</tr>
<tr>
<td>Have you ever participated in an instrumental music program?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>6/6 played an instrument</td>
</tr>
<tr>
<td>Has anyone in your family or immediate circle of friends ever participated in an instrumental music program?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>6/6 family or close friends played an instrument</td>
</tr>
<tr>
<td>As a child, would you identify with any of the “at-risk” demographic groups that are being explored in this study (low-SES, ELL and/or minority)?</td>
<td>No</td>
<td>Yes, Low-SES</td>
<td>No</td>
<td>No</td>
<td>Yes, Low-SES</td>
<td>No</td>
<td>2/6 Low-SES 1/6 ELL</td>
</tr>
</tbody>
</table>

**Administrator focus group participants.** Three educators with extensive careers as teachers and administrators participated in the focus group. Background demographics for this group are presented in Table 4.4. Their experience ranges from 23 years to 50 years in education with an average of 34 years. Two of the three had experiences in districts other than the one in question. All have advanced degrees in education and two of the three have earned doctoral degrees. All three have teaching and administration experience at both the elementary and middle school levels. Two of the three indicated having a coaching or athletic background. No participants identified with low-SES, ELL or minority backgrounds.
Only one of the three played an instrument, as a child while the other two did not have that experience. All indicated that they had family members who were involved in music. One reflected often on the experience of her school-aged son, the other on her grandchildren, while the last stated that his mother “sang in numerous choruses and local theater productions.” Although the question was specific to playing a musical instrument the theme of commenting on all types of musical involvement, artistic involvement and co-curricular involvement will be explored in greater detail below.

Table 4.4 Background Questionnaire Information: Administrator Participants

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>ADMIN #1</th>
<th>ADMIN #2</th>
<th>ADMIN #3</th>
<th>ADMINISTRATOR TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>How long have you been a teacher/administrator in this district?</td>
<td>37 years</td>
<td>17</td>
<td>28 years</td>
<td>27 years</td>
</tr>
<tr>
<td>Did you serve in this capacity prior to being employed in this district?</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>2/3 only taught in district</td>
</tr>
<tr>
<td>Total number of years teaching</td>
<td>50 years</td>
<td>23 years</td>
<td>28 years</td>
<td>34 average: total years teaching</td>
</tr>
<tr>
<td>Have you ever participated in an instrumental music program?</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>1/3 played an instrument</td>
</tr>
<tr>
<td>Has anyone in your family or immediate circle of friends ever participated in an instrumental music program?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>3/3 family or close friends played an instrument</td>
</tr>
<tr>
<td>As a child, would you identify with any of the “at-risk” demographic groups that are being explored in this study (low-SES, ELL and/or minority)?</td>
<td>Yes, Low-SES</td>
<td>No</td>
<td>No</td>
<td>1/3 Low-SES 0/3 ELL</td>
</tr>
</tbody>
</table>
Data Collection Procedures

Phase one data collection procedures. In Phase One, standardized test scores from the 2014 Eighth Grade MCAS Test for English Language Arts were collected for 782 eighth grade students. Some student scores were exempted from this study if a student did not have recorded scores on the ELA MCAS or the score report was deemed incomplete. This is a secondary data analysis of existing test scores that were originally collected by the MA Department of Elementary and Secondary Education (MA DESE) and stored in the digital Edwin Analytics data warehouse. The original purpose of this data was intended for district and school improvement planning.

Data was downloaded from Edwin into Microsoft Excel. It was reviewed for any inconsistencies or extreme outliers. There were none found in the data. All of the student data were re-coded with the designation “instrumental” or “non-instrumental” based each student’s participation in instrumental music classes from grades 4-8. It was unknown if students participated in instrumental lessons for 4 or less years therefore there is a possibility that students in the “non-instrumental” group may have played an instrument during their educational career. All data were uploaded into SPSS for data analysis.

The 2013-2014 school year was chosen year because standardized test scores on MCAS exams are not released to the district in a timely manner and therefore the tests from school year 2014-2015 were not readily available. Also, it was the last year that the entire district participated in MCAS prior to moving to the piloting of the PARCC exam. Use of the new PARCC exam would not yield student growth data or accurate comparisons with state averages.

Phase two data collection procedures. During Phase Two, data was collected through three separate focus groups where study participants were asked a series of questions related to
their perceptions, values and beliefs regarding the possible difference between playing a musical instrument for five years and achievement in ELA. The researcher facilitated the focus groups and provided clarifying information, as well as, statistical data from Phase One of the study.

One focus group was conducted for each of the following three types of educators: 1) middle school administrators, 2) music teachers of grades 4-8, and, 3) middle school ELA teachers. Each focus group session lasted approximately 90 minutes. Prior to the discussion, each educator was asked to complete a background questionnaire (Appendix F). The schedule of each focus group had three main sections: a) questioning about basic demographics and baseline perceptions/beliefs regarding instrumental student achievement; b) presentation of the analysis of Phase One student data; c) questioning about reaction to data analysis about student test scores. Appendix F contains the question set for the focus groups that formed the foundation of the inquiry. Clarifying questions were asked but the discussion did not veer far from the original questions. All questions were asked during each group. Participants were told that they could choose not to participate at any time during the session.

Throughout the focus groups, the participants were asked if the researcher’s interpretation of the responses were correct. Consensus form all participants on specific questions were recorded as well as direct responses. All focus groups were conducted at a location familiar to the participants that ensured privacy such as a school conference room. All focus groups were audio recorded. This audio recording was then transcribed and sent electronically to the participants to verify accuracy.
Data Analysis and Overview of Findings – Phase One

**Phase one data analysis - overview.** The secondary data analysis was performed through the use of eight separate t-tests. Each t-test examined an aspect of the literacy achievement scores for the eighth grade ELA MCAS. It was important to analyze these eight scoring reports because educators extract different types of meaning from the different reports to create a complete picture of student, cohort, and school-wide literacy achievement. The eight t-tests included types of scoring (i.e., percent correct, scaled score, and student growth percentile), question types, (i.e., multiple choice, open response), and specific literacy standards addressed in the questions (i.e., craft and structure, key ideas and details, vocabulary acquisition and use). The ELA MCAS at the eighth-grade level is a reading comprehension test and does not measure achievement in writing. Each of these eight t-tests will be discussed in detail below to determine a possible difference between students who studied instrumental music instruction for five consecutive years and those who did not.

The independent t-test is an “inferential statistic that determines whether there is a statistically significance difference between the means in two unrelated groups,” (Lund & Lund, 2013). To designate the two groups the student scores were separated into instrumental students (n=86) and non-instrumental students (n=696). This designation was based on the educational history of each child. Instrumental students were those that played an instrument for five consecutive years in the studied district (i.e., form grades 4-8); Non-instrumental students were those that had not played an instrument for five consecutive years. This group could include students who played four or fewer years but did not include any student who played an instrument in a scheduled eighth grade band class during the 2013-2014 school year.
An additional consideration is that the group size is unbalanced between the two groups. There were 86 in the instrumental group and 696 in the non-instrumental group. The choice to use the data from all instrumental students was made because it was not possible to match the 86 instrumental students (treatment group) to 86 non-instrumental (control group) due to lack of access to demographic identifiers which could constitute moderator and mediator variables. According to Baron and Kenny (1986) a moderator variable can influence or change the strength of the relationship between the two variables; a mediator variable explains the relationship of the two variables. Knowing these moderator and mediator variables (Baron & Kenny, 1986) and matching prior to analysis would have been ideal but was not realistic in this study.

Therefore, two other considerations were made to address the limitation of unbalanced group sizes. The first was that frequency distributions were run to ascertain if data falls within the normal curve (Salkind, 2010). This was done because t-tests rely on an ‘Assumption of Normality.’ According to Mordkoff (2011) the Assumption of Normality, “asserts that the distribution of sample means (across independent samples) is normal.” Mordkoff further states that it is assumed that the population will configure to a normal curve therefore, if a large enough sample is collected then the means from samples of any size will be normally distributed.” Therefore, “rule of thumb” is that a sample of 30 or more is sufficient to assume normality for a t-test. With that said, when a sample is over 30 and does not display normal characteristics, it is important to describe possible causes and ramifications.

All of the distribution histograms are contained in the Appendix I. One can infer from these histograms that the non-instrumental group which is much larger in size, is normally distributed or approaches normal at a greater frequency than the instrumental group. Perhaps if a larger number of students were in the instrumental group normality may be evident. The current
data for the instrumental group is skewed to the left (or negatively) for most scoring categories which means that more of the scores are at the higher end of the distribution. A simplistic reason for this is that these instrumental students scored higher in general than their non-music peers. The Craft and Structure scoring had a normal distribution in both groups and both Vocabulary and Student Growth Percentile had only a slight left skew. Nevertheless, because normality was not achieved in all measures the strength of the t-test may be lessened.

The second consideration to assure the accuracy of a t-tests refers to “homogeneity of variance” (Lund & Lund, 2013). This can be achieved using Levene’s Test for Equality of Variances that was conducted prior to the independent t-test. Lund & Lund (2013) continue stating that Levene’s Test for the Equality of Variances provides a significance value (p-value)…” that, “if it is greater than 0.05, our group variances can be treated as equal” (p. 1). For the purposes of reading all of the tables indicating Levene’s Test for the Equality of Variances, if the significance probability (Sig. value) is less than or equal to 0.05 then equality of variance is not assumed and data should be read from the bottom row of the figure. Likewise, if the significance probability is greater than 0.05 then equality of variances is assumed and the top row of data is notable. Similar to the discussion on normal distribution, in cases where a data set did not meet the assumption of variance, the strength of the test may be lessened.

So that the researcher could “address whether the hypotheses or questions were supported or whether they were refuted…whether the treatment that was implemented actually made a difference for the participants who experienced them,” (Creswell J. W., 2009, p. 167), the following hypotheses were formulated for this phase.
• H1 Null Hypothesis: There is no difference between students who play a musical instrument for five years and those who do not regarding achievement on standardized tests for ELA in the eighth grade.

• H2 Alternate Hypothesis: There is a difference between students who play a musical instrument for five years and those who do not regarding achievement on standardized tests for ELA in the eighth grade.

Seven out of eight measurements yielded statistical significance with the significance level (alpha) set at 0.05 or confidence interval of 95%. This indicates that 95 out of 100 times that the tested population is sampled the same result should occur. An overview of points allocated for sections of the test, statistical significance of the analysis, and mean differences for these eight tests are provided in Table 4.5. All eight t-tests are discussed in the subsequent sections. Separate tables illustrating each independent t-test accompany the narrative description. These tables include scores for the instrumental and non-instrumental groups and $p$ value.
Table 4.5 Independent t-tests for Spring 2014 Eighth Grade ELA MCAS Data

<table>
<thead>
<tr>
<th>Heading</th>
<th>Subheading</th>
<th>Points allocated</th>
<th>Statistically significant</th>
<th>p value</th>
<th>Mean difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ways to Score</td>
<td>Scaled Score</td>
<td>200-280 pts.</td>
<td>Yes</td>
<td>&lt; .001</td>
<td>10.433551</td>
</tr>
<tr>
<td>Ways to Score</td>
<td>Percent Correct</td>
<td>0%-100%</td>
<td>Yes</td>
<td>&lt; .001</td>
<td>14.579</td>
</tr>
<tr>
<td>Ways to Score</td>
<td>Student Growth Percentile</td>
<td>0-100</td>
<td>No</td>
<td>0.121</td>
<td>4.889</td>
</tr>
<tr>
<td>Question Types</td>
<td>Multiple-Choice</td>
<td>36 pts.</td>
<td>Yes</td>
<td>&lt; .001</td>
<td>14.90434</td>
</tr>
<tr>
<td>Question Types</td>
<td>Open-Response</td>
<td>16 pts.</td>
<td>Yes</td>
<td>&lt; .001</td>
<td>13.59376</td>
</tr>
<tr>
<td>Language Standard</td>
<td>Vocabulary Acquisition and Use</td>
<td>4 pts.</td>
<td>Yes</td>
<td>&lt; .001</td>
<td>13.33951</td>
</tr>
<tr>
<td>Reading Standard</td>
<td>Craft and Structure</td>
<td>15 pts.</td>
<td>Yes</td>
<td>&lt; .001</td>
<td>15.01019</td>
</tr>
<tr>
<td>Reading Standard</td>
<td>Key Ideas and Details</td>
<td>31 pts.</td>
<td>Yes</td>
<td>&lt; .001</td>
<td>14.64271</td>
</tr>
</tbody>
</table>

As illustrated in the Table 4.5, there was statistical significance for two out of three analyzed ways of scoring (i.e. Percent Correct, Scaled Score). Denoted by ‘No’ in the ‘Statistically significant’ column above, Student Growth Percentile did not show significance. Each of the ways of scoring is important to educators as they plan for improvement measures for individual students or cohorts.

Significance was also found for analysis of both types of questions. Taken together, these constitute the entire test (i.e. Multiple-Choice and Open-Response). Analysis of the question type is important because if the findings indicated that one group scored higher on one type of question or the other, educators can make preparations to enhance student skills. For
example, students who struggle with open response questions have difficulty organizing their thoughts, synthesizing information and/or using evidence from the text in support of their answer. Therefore, based on the findings discussion during the focus groups would be warranted.

As part of a detailed analysis of the ELA standards addressed in the questions, all showed significance. The ELA teachers expressed that some of these categories are difficult for students to demonstrate mastery. This indicates that students who played a musical instrument for five years scored higher than students who did not play. Based on the strength of this collection of analysis, the researcher rejects the null hypothesis. Therefore, we find a difference between students who play a musical instrument for five years and those who do not regarding achievement on standardized tests for ELA in the eighth grade. Each t-test will be described below with its accompanying tables and figures.

**Phase one data analysis - ways of scoring.** The MCAS test score is displayed different ways so that educators have the ability to take a deep look at the data and design program improvements. For administrators one of the most important scoring displays designates the student achievement level. This achievement level is defined by a pre-determined range of the scaled score. The ‘Scaled Score’ is a conversion from the actual points that are awarded for correct answers. Each year the scale is decided based on the cohort who participated in the assessment. This scale is translated into the achievement level mentioned above. ‘Percent correct’ is calculated based on the number of actual questions that a student answers correctly. Some questions are worth more than one point, however, the percent correct report does not account for this weighting. The last scoring report, Student Growth Percentile is different than
the first three because it takes into account the student’s previous MCAS tests from prior years to calculate the student’s growth over time.

**Phase one data analysis - scaled score.** Schools and school districts in Massachusetts are held accountable for their students’ test scores on MCAS (or PARCC). This accountability is largely determined on the ratings of proficiency or ‘achievement ratings’ for all of the students in the school or district. Achievement ratings are based on ranges of the scaled score. An independent-samples t-test was conducted to compare instrumental students and non-instrumental students regarding the scaled scores. There was a significant difference in the scores for instrumental students (N = 86, M= 247.4651, SD = 10.24144) and non-instrumental students (N = 696, M = 237.0316 SD = 13.56844) conditions; t (780) = 8.564, p < .001 (with p ≤ .05). These results suggest that instrumental music instruction has an effect on achievement in MCAS standardized tests of literacy through the realization of a higher scaled score.

Furthermore, it is important to note that the instrumental group has a mean score of 247 that is considered “Proficient” (240-258) according to the MA DESE (2014) whereas; at 237 the non-instrumental group has a mean that is “Needs Improvement” (220-238). Statistical analysis for group statistics pertaining to scaled score are presented in Table 4.6 and independent samples tests for scaled score are presented in Table 4.7.

Table 4.6 Group Statistics for Scaled Score

<table>
<thead>
<tr>
<th>SCALED SCORE</th>
<th>Student Type</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Instrumental</td>
<td>86</td>
<td>247.4651</td>
<td>10.24144</td>
<td>1.10436</td>
</tr>
<tr>
<td></td>
<td>Non-Instrumental</td>
<td>696</td>
<td>237.0316</td>
<td>13.56844</td>
<td>.51431</td>
</tr>
</tbody>
</table>
Table 4.7 Independent Samples Test for Scaled Score

<table>
<thead>
<tr>
<th>SCALED SCORE</th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>8.564</td>
<td>125.149</td>
<td>&lt; .001</td>
</tr>
</tbody>
</table>

Phase one data analysis - percent correct. An independent-samples t-test was conducted to compare the MCAS achievement level of instrumental (N = 86) and non-instrumental (N = 696) eighth grade students. There was a statistically significant difference between the student instrumentalists and those who were not instrumentalists regarding the achievement level, instrumentalists (M = 73.26, SD = 14.234) and non-instrumentalists (M = 58.68, SD = 18.916), t(780) = 8.606, p ≤ .05, CI.95, 11.226, 17.932. For educators who are accustomed to grading on a 100-point scale, the percent correct scoring report is a concrete illustration of achievement. In the data presented above, on average instrumentalists outscore their peers by 14.579%. Statistical analysis for group statistics pertaining to percent correct are presented in Table 4.8. Independent samples tests for percent correct is presented in Table 4.9.

Table 4.8 Group Statistics for Percent Correct

<table>
<thead>
<tr>
<th>PERCENT CORRECT</th>
<th>Student Type</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Instrumental</td>
<td>86</td>
<td>73.26</td>
<td>14.234</td>
<td>1.535</td>
</tr>
<tr>
<td></td>
<td>Non-Instrumental</td>
<td>696</td>
<td>58.68</td>
<td>18.916</td>
<td>.717</td>
</tr>
</tbody>
</table>
Table 4.9 Independent Samples Test for Percent Correct

<table>
<thead>
<tr>
<th>PERCENT CORRECT</th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>10.780</td>
<td>.001</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>8.606</td>
<td>.001</td>
</tr>
</tbody>
</table>

In addition to the comparison between students in the district who play an instrument and those who do not, Table H1 in Appendix H shows a comparison between all students in the studied district and the state of Massachusetts regarding the percent of correct answers.

**Phase one data analysis - student growth percentile.** An independent-samples t-test was conducted to compare instrumental students and non-instrumental students regarding the Student Growth Percentile (SGP). There was not significant difference in the scores for instrumental students (N = 86, M = 49.09, SD = 26.934) and non-instrumental students (N = 646, M = 44.20, SD = 29.361) conditions; t (730) = 1.564, p = 0.121 (with p ≤ .05). The number of non-instrumental participants in this group is lower than all other calculations (N = 646). This is because 50 students whose scores were analyzed for all other t-tests were not eligible for a student growth percentile calculation. More than likely these 50 students did not have a MCAS score from subsequent years and, therefore growth could not be calculated. This assumption is plausible based on the knowledge that all instrumental students could be analyzed considering that their continuous membership in a district instrumental program was verified prior to the
Regardless of the total number of participants, these results suggest that instrumental music instruction has no significant effect on the amount of growth that a student realizes on MCAS for ELA from one year to the next. Statistical analysis for group statistics pertaining to Student Growth Percentile are presented in Table 4.10 and independent samples tests for Student Growth Percentile are presented in Table 4.11.

Table 4.10 Group Statistics for Student Growth Percentile

<table>
<thead>
<tr>
<th>STUDENT GROWTH PERCENTILE</th>
<th>Student Type</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Instrumental</td>
<td>86</td>
<td>49.09</td>
<td>26.934</td>
<td>2.904</td>
</tr>
<tr>
<td></td>
<td>Non-Instrumental</td>
<td>646</td>
<td>44.20</td>
<td>29.361</td>
<td>1.155</td>
</tr>
</tbody>
</table>

Table 4.11 Independent Samples Test for Student Growth Percentile

<table>
<thead>
<tr>
<th>STUDENT GROWTH PERCENTILE</th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>1.564</td>
<td>113.647</td>
<td>0.121</td>
</tr>
</tbody>
</table>

*Phase one data analysis - question types.* According to the MA DESE (2014), the ELA MCAS for Eighth Grade has two types of questions: multiple-choice and open-response. Together these two types of questions constitute the entire test. Educators use these reports to adjust their instruction and design programs for student success. When diagnosing student
deficiencies a close look at achievement on types of questions is needed to design instructional strategies. Additionally, open-response questions typically require a higher level of synthesis therefore, analyzing a group of students’ ability to do this is beneficial to educators. As described in detail below, both t-tests yielded statistically significant results thus indicating that when combining the two sections as a whole, that there is a difference between playing a musical instrument for five consecutive years and higher achievement on standardized tests of literacy.

**Multiple-choice questions.** An independent-samples t-test was conducted to compare instrumental students and non-instrumental students in the category of multiple-choice questions. There was a significant difference in the scores for instrumental students (N = 86, M = 77.8023, SD = 15.32996) and non-instrumental students (N = 696, M = 62.8980, SD = 20.20869) conditions; t (780) = 8.181, p < .001 (with p ≤ .05). These results suggest that instrumental music instruction has an effect on achievement in MCAS standardized tests of literacy. Specifically, these results suggest that instrumental students outscore their peers on multiple-choice questions as part of these literacy tests. Statistical analysis for group statistics pertaining to multiple-choice question types is presented in Table 4.12 and independent samples tests for multiple-choice question types are presented in Table 4.13.

<table>
<thead>
<tr>
<th>MULTIPLE-CHOICE</th>
<th>Student Type</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Instrumental</td>
<td>86</td>
<td>77.8023</td>
<td>15.32996</td>
<td>1.65307</td>
</tr>
<tr>
<td></td>
<td>Non-Instrumental</td>
<td>696</td>
<td>62.8980</td>
<td>20.20869</td>
<td>0.76601</td>
</tr>
</tbody>
</table>
Table 4.13 Independent Samples Test for Multiple Choice

<table>
<thead>
<tr>
<th>MULTIPLE-CHOICE</th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>11.349</td>
<td>.001</td>
<td>6.607</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>8.181</td>
<td>124.719</td>
<td>&lt; .001</td>
</tr>
</tbody>
</table>

**Open-response questions.** Another independent-samples t-test was conducted to compare instrumental students and non-instrumental students regarding question types. This test was conducted on the scores concerning open-response questions. There was a significant difference in the scores for instrumental students (N = 86, M = 62.9070, SD = 17.36096) and non-instrumental students (N = 696, M = 49.3132 SD = 20.67932) conditions; t(780) = 6.498, p < .001 (with p ≤ .05). These results suggest that instrumental music instruction has an effect on achievement in MCAS standardized tests of literacy. Additionally the results suggest that instrumental students outscore their peers on open-response questions as part of these literacy tests. Statistical analysis for group statistics pertaining to open-response question types is presented in Table 4.14 and independent samples tests for open-response question types are presented in Table 4.15.

Table 4.14 Group Statistics for Open-Response

<table>
<thead>
<tr>
<th>OPEN-RESPONSE</th>
<th>Student Type</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Instrumental</td>
<td>86</td>
<td>62.9070</td>
<td>17.36096</td>
<td>1.87208</td>
</tr>
<tr>
<td></td>
<td>Non-Instrumental</td>
<td>696</td>
<td>49.3132</td>
<td>20.67932</td>
<td>.78385</td>
</tr>
</tbody>
</table>
### Table 4.15 Independent Samples Test for-Open Response

<table>
<thead>
<tr>
<th>OPEN-RESPONSE</th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>8.113</td>
<td>.005</td>
<td>5.846</td>
</tr>
</tbody>
</table>

**Phase one data analysis - literacy standards addressed.** The 2014 ELA MCAS test is based on state determined grade level expectations for student learning. These expectations are derived from the “Massachusetts Curriculum Framework for English Language Arts and Literacy.” For the purposes of this study, this information is also important because the student achievement data is also analyzed based on the College and Career Readiness (CCR) Standards that are addressed in individual questions. This analysis allows the researcher to look specifically at the relationship between instrumental students and specific types of literacy skills. The Eighth Grade ELA MCAS has questions that address two types of anchor standards: Language and Reading.

**Language anchor standard – vocabulary acquisition and use.** An independent-samples t-test was conducted to compare instrumental students and non-instrumental students in the category of questions addressing vocabulary acquisition and use. There was a significant difference in the scores for instrumental students (N = 86, M = 76.1628, SD = 19.89198) and non-instrumental students (N = 696, M = 62.8233, SD = 25.72481) conditions; t (780) = 5.661, p
< .001 (with p ≤ .05). These results suggest that instrumental music instruction has an effect on achievement in MCAS standardized tests of literacy pertaining to Vocabulary Acquisition and Use. Statistical analysis for group statistics pertaining to Vocabulary Acquisition and Use standards addressed in questions is presented in Table 4.16 and likewise, an independent samples tests for standards addressed by these questions are presented in Table 4.17.

Table 4.16 Group Statistics for Vocabulary Acquisition and Use

<table>
<thead>
<tr>
<th>VOCABULARY ACQUISITION AND USE</th>
<th>Student Type</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Instrumental</td>
<td>86</td>
<td>76.1628</td>
<td>19.89198</td>
<td>2.14501</td>
</tr>
<tr>
<td></td>
<td>Non-Instrumental</td>
<td>696</td>
<td>62.8233</td>
<td>25.72481</td>
<td>.97510</td>
</tr>
</tbody>
</table>

Table 4.17 Independent Samples Test for Vocabulary Acquisition and Use

<table>
<thead>
<tr>
<th>VOCABULARY ACQUISITION AND USE</th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>20.736</td>
<td>.000</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>5.661</td>
<td>123.118</td>
</tr>
</tbody>
</table>

Reading anchor standard – craft and structure. An independent-samples t-test was conducted to compare instrumental students and non-instrumental students in the category of questions addressing craft and structure. There was a significant difference in the scores for instrumental students (N = 86, M = 73.5116, SD = 18.03835) and non-instrumental students (N = 696, M = 58.5014, SD = 22.12261) conditions; t (780) = 7.086, p < .001 (with p ≤ .05). These
results suggest that instrumental music instruction has an effect on achievement in MCAS standardized tests of literacy pertaining to Craft and Structure. Statistical analysis for group statistics pertaining to Craft and Structure standards addressed in questions is presented in Table 4.18 and likewise, an independent samples tests for standards addressed by these questions are presented in Table 4.19.

Table 4.18 Group Statistics for Craft and Structure

<table>
<thead>
<tr>
<th>CRAFT AND STRUCTURE</th>
<th>Student Type</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Instrumental</td>
<td>86</td>
<td>73.5116</td>
<td>18.03835</td>
<td>1.94513</td>
</tr>
<tr>
<td></td>
<td>Non-Instrumental</td>
<td>696</td>
<td>58.5014</td>
<td>22.12261</td>
<td>.83856</td>
</tr>
</tbody>
</table>

Table 4.19 Independent Samples Test for Craft and Structure

<table>
<thead>
<tr>
<th>CRAFT AND STRUCTURE</th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>6.006</td>
<td>.014</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>7.086</td>
<td>119.028</td>
</tr>
</tbody>
</table>

**Reading anchor standard – key ideas and details.** A final independent-samples t-test was conducted to compare instrumental students and non-instrumental students in the category of questions addressing Key Ideas and Details. There was a significant difference in the scores for instrumental students (N = 86, M = 74.2907, SD = 13.73177) and non-instrumental students (N = 696, M = 59.6480, SD = 19.26255) conditions; t (780) = 8.869, p < .001 (with p ≤ .05). These
results suggest that instrumental music instruction has an effect on achievement in MCAS standardized tests of literacy pertaining to Key Ideas and Details. Statistical analysis for group statistics for Key Ideas and Details standards addressed in questions is presented in Table 4.20. An independent samples tests for standards addressed by these questions are presented in Table 4.21.

Table 4.20 Group Statistics for Key Ideas and Details

<table>
<thead>
<tr>
<th>KEY IDEAS AND DETAILS</th>
<th>Student Type</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Instrumental</td>
<td>86</td>
<td>74.2907</td>
<td>13.73177</td>
<td>1.48074</td>
</tr>
<tr>
<td></td>
<td>Non-Instrumental</td>
<td>696</td>
<td>59.6480</td>
<td>19.26255</td>
<td>.73014</td>
</tr>
</tbody>
</table>

Table 4.21 Independent Samples Test for Key Ideas and Details

<table>
<thead>
<tr>
<th>KEY IDEAS AND DETAILS</th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>18.558</td>
<td>.000</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>8.869</td>
<td>.001</td>
</tr>
</tbody>
</table>

Phase one data analysis and findings – summary. In seven out of eight independent t-tests statistical significance was found to support a difference between students who played a musical instrument for five consecutive years and those who did not. Students who played an instrument consistently had higher achievement on standardized tests of literacy. In the case of Student Growth Percentile, the measurement that did not show statistical significance, it is noted
that this score measures the rate of growth in relation to peers but is not a measure of high achievement. Therefore, based on the strength of this collection of analysis, we reject the Phase One null hypothesis and find a difference between students who play a musical instrument for five years and those who do not regarding achievement on standardized tests for ELA in the eighth grade. The difference between the two groups speaks directly to the central question of this study.

Data Analysis and Overview of Findings – Phase Two

In the second phase of data collection and analysis the researcher employed methods from the qualitative tradition. The collection of data in Phase Two was through three separate focus groups consisting of either middle school administrators, music educators of grades 4-8 or middle school English Language Arts (ELA) educators. The researcher facilitated the focus groups with a set of questions designed to elicit the perceptions, beliefs and values of participants. Data was collected through a background questionnaire as well as through audio recording of the session with notations of consensus or other interpersonal interaction. Transcripts of the audio were produced and sent to participants for verification of accuracy.

In reference to qualitative data analysis, Miles and Huberman (1994) state that this method consists of "three concurrent flows of activity: data reduction, data display, and conclusion drawing/verification" (p. 10). The researcher chose to analyze the data through the process of coding that according to Saldaña (2009) is a cyclical iterative process of consideration and reconsideration of the data. The codes were derived from transcripts of the focus groups that were uploaded into the qualitative software Max QDA for organization into the first cycle assignment of codes. An inductive analytic strategy of “working the data from the ground up” (Yin, 2014, p. 136) was utilized to identify patterns and trends in the data that point to relevant
connections. As a second cycle coding method the researcher reorganized, condensed and collapsed sub-categories to finalize a set of coded themes (Saldaña, 2009).

**Discussion of Themes and Sub-Categories**

Through the process described above, the researcher arrived at nine major code themes. Three code categories concerned direct references to subjects that were pervasive throughout the discussions. The first code category was a direct reference to district policies that affect opportunity for students to participate in the instrumental program. The second concerned direct reference to ‘at-risk’ or urban students and families; and the third was for statements that referenced next steps or planning for future action. The other six codes pertained to aspects of participants’ perceptions, beliefs or values. Therefore, the fourth code contained general statements about what the participants were basing their perception, beliefs or values. The fifth was about the perceived relationship between ELA and music. The sixth and seventh code categories were about beliefs that were expressed - namely, that “band students have higher achievement” and that “band builds skills for success.” Lastly, the eighth and ninth code categories were based on expressed values. One contained statements on valuing indirect results of participation in musical instrument instruction while the last code category was about the participants’ value of providing opportunity for all students. The nine code categories that represent the major themes are in Figure 4.1.
Figure 4.1 Code System Major Themes

- Reference to: District policies/resources
- Reference to: At Risk Students/Urban District
- Basis for perception, belief, value
- Perception: Relationship Between ELA and Music
- Belief: Band Builds Skills for Success
- Belief: Band Students Have Higher Achievement
- Value: Indirect results of participation
- Value: Providing opportunity
- Planning for next steps

Figure 4.1 has the major code categories or themes while Figure 4.2 is a more detailed look at the final coding categories and sub-categories. The sub-categories represent more specific thoughts in the major categories. During second cycle coding some of the subcategories were reorganized or re-categorized. This was especially true if the sub-category only had a small number of codes or if it only had codes from one focus group. Findings from each of the major themes and some of the more salient sub-categories are discussed in detail below. In the discussion of these findings for each sub-section, information from the administrator focus group is presented first, followed by music educators and finally ELA educators.
Figure 4.2 Complete Code System with Major Themes and Sub-Categories

<table>
<thead>
<tr>
<th>Reference to: District Policies/Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Perception: short-sighted vs. Long term thinking</td>
</tr>
<tr>
<td>• Support from Stakeholders</td>
</tr>
<tr>
<td>• Personnel</td>
</tr>
<tr>
<td>• Time/scheduling</td>
</tr>
<tr>
<td>• Number of Free Instruments</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reference to: ‘At-Risk’ Students/Urban District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basis for Perception, Belief, Value</td>
</tr>
<tr>
<td>• Belief Based on Research</td>
</tr>
<tr>
<td>• Reference to Brain Science</td>
</tr>
<tr>
<td>• Belief based on Personal Experience</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Perception: Relationship Between ELA and Music</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Perceptions, beliefs and values statements</td>
</tr>
<tr>
<td>• Difference</td>
</tr>
<tr>
<td>• Questions about other factors contributing to difference</td>
</tr>
<tr>
<td>• No difference or difference for math</td>
</tr>
<tr>
<td>• Possible explanations</td>
</tr>
<tr>
<td>• Vocabulary/Language</td>
</tr>
<tr>
<td>• Details</td>
</tr>
<tr>
<td>• Reading</td>
</tr>
<tr>
<td>• Listening</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Belief: Band Students Have Higher Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Belief: Students who are ‘involved’ do better in life</td>
</tr>
<tr>
<td>• Belief: Providing Life experiences/background knowledge</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Belief: Band Builds Skills for Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Student Engagement/motivation</td>
</tr>
<tr>
<td>• Creating a culture of Band</td>
</tr>
<tr>
<td>• Band students are involved</td>
</tr>
<tr>
<td>• 21st Century Skills</td>
</tr>
<tr>
<td>• Social Emotional Learning</td>
</tr>
<tr>
<td>• Habits of Mind</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Value: Indirect Results of Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Value: School Culture/planning</td>
</tr>
<tr>
<td>• Value: Interdisciplinary connection</td>
</tr>
<tr>
<td>• Band as a motivator for grades</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Value: Providing Opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Value: Educating the Whole Child</td>
</tr>
<tr>
<td>• Fighting for Children’s Needs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Planning for Next Steps</th>
</tr>
</thead>
</table>
(1) Reference to: district policies/resources. A common theme across all three focus groups was references to district policies concerning resource allocation. Participants in all groups referenced the budget cuts that occurred in the district over 15 years prior and the detrimental effects that the cuts had on the instrumental opportunities for students. One administrator commented that this previously lack of resource allocation to music programs was short sighted because it, “Negatively impacts students… it’s a huge disservice to the kids, and they [decision makers] have to be very smart about where they’re going to cut, because this is the only shot [for an urban child].” Across focus groups they spoke with pride that the music program was in the process of “re-building” and that opportunity was afforded the significant ‘at-risk’ population in the schools. All three groups had consensus that more district resources should be dedicated to instrumental music programs to provide increased opportunity for especially for ‘at-risk’ students.

The administrators felt that it is “unfortunate” that the arts are the first place that decision-makers look for cuts. One administrator stated, “Unfortunately, in this district in the past, it [music] has always been the first place that gets eliminated or cut. These positions get cut, and it’s very unfortunate that it is the mindset in the past of some of the people who make those decisions, because it happens typically.” The administrators who participated spoke about being vocal against cuts to the arts in the district. They were proud of the “re-building” of the instrumental program and attributed some of the growth to having free instruments. One administrator lauded the amount of instruments that are available saying, “A lot of kids who couldn’t afford to purchase or rent an instrument to participate, that [we offer instruments], right there says a lot to kids about wanting you to have this opportunity, because this could be the key to your life. This could very well be the thing that helps you build your confidence.”
Administrators want to add more instruments and personnel to the music program so that more students could have the opportunity to participate.

Music educators agree that instrumental music is one of the first things to be cut. They feel that this is because the instrumental classes do not provide planning time for classroom teachers therefore their worth is de-valued. They also feel that stakeholders do not know how many resources (i.e. time and money) are expended to present a high quality public performance. They concur that public performances are key to gaining stakeholder support.

ELA teachers agree that the arts are the first to be cut stating, “I think that’s the first thing they cut when they need money and if they realized that these are the future people and look at how much they are growing, and they are doing all this important work, and if we’re cutting it and we’re not giving them the opportunity to grow...”

*Perception: Shortsighted vs. long-term thinking.* As part of the first code “References to district resources/policies,” administrators expressed that it is shortsighted to cut music programs because it, “Negatively impacts students,” and for, “urban kids it’s their only opportunity” one purported. “It’s a huge disservice to the kids, and they have to be very smart about where they’re going to cut, because this is the only shot [for an urban child].” Administrators also cited seeing the effect of the cuts from the past and noting the importance of the ‘rebuilding’ period over the last decade in this district.”

Music educators agreed that at times other stakeholders are concerned when instrumental students are missing time in other classes (i.e. through a group lesson pull out). Stakeholders therefore, may have a shortsighted or limited view of the potential impact of instrumental instruction. Music educators note that, “This district, we look too often at the short-term. Your [the researcher’s] study is five years... over a long time can make a huge difference when you
actually commit to these programs.” They noted that students and teachers feel immense pressure to make short-term gains on measures of literacy by the district and in statewide testing. They commented that although they do not like the high degree of value placed on high-stakes testing, they commented, “I can see both sides of it because the district is underperforming about a lot so we have to move quick. And, I get that, I get that urgency.”

Regarding the ELA teacher focus group, an ELA teacher expressed that the concern she felt previous to learning about the differences between instrumental and ELA are now unwarranted in her mind. She stated, “But, in lieu of our conversation, I guess we shouldn’t be so worried about kids being pulled [for instrumental instruction] because that’s going to help them in the long run anyway.” ELA teachers also agreed that they often look at short-term results on assessments and not at trends over a longer period of time. They appreciated the opportunity to learn about differences between different subjects.

**Support from stakeholders – community and parents.** In reference to stakeholders in the community, the administrators noted that cultural organizations exist that supports the arts in our schools. They also said that stakeholders who are decision makers at all levels (i.e. state legislators, city officials and School Committee members) need to also understand the “big picture” regarding the impact that “this category [arts] of subject areas that kids should have access to.”

Regarding parents and community supporters, the music teachers felt that concerts and displays of student musicianship are an important avenue to gain public support. They added that they see growing support in recent years that has yielded higher amounts of students playing instruments throughout the grades. This community support and awareness manifests itself in different forms of parent advocacy. Demanding schedule changes for their students to ensure
that band is included in their child’s schedule, as well as public displays of advocacy for budget enhancements were increasingly seen in recent years. The music educators commented that the trend of providing more opportunity to be involved in instrumental instruction was recently being extended to all ‘types’ of students including “substantially separate” special education students, ELLs and even home schooled children.

*Support from stakeholders – within the schools administrators and teachers.*

Administrators commented that they think that stakeholders within the schools do not always value the importance of the arts. They stated, “We have teachers within our own schools that don’t value the unified arts classes, or they pull kids from their classes. They think their classes are more important than a music class, and they give that perception off to children, to other teachers.” They commented that personally they have worked to change the culture within their schools with policies such as weighting the unified arts classes equal to other academic courses for determination of honor roll etc. In regard to support from other administrators in the district they feel that support is still, “mixed.” They noted that some administrators feel the need to cut the arts first because they think it would have less impact than other cuts. However, they reported that other administrators were, “coming around” and the value of the arts in the district was “improving.”

One other salient point in this code sub-category was a reference to recent state accountability determinations that designated the district’s arts magnet school as a Level 1, rising from a Level 3 the year before. The administrators applauded the accomplishment as a testament to their personal belief that a strong arts program does not take time away from learning the other subjects. They believe that time in arts education instruction increases achievement overall. One administrator commented that other district administrators should see this accomplishment as an
opportunity to learn about best practices for school improvement efforts. They emphasized that the arts magnet school had the buy-in from stakeholders within and outside the school. Regarding this belief they commented, “Think if we can tap into that and learn from that, as a colleague I would want to know, what did you do? How did you do it? Look at the kids who are involved in the dance program, in the music programs. The performances at [the arts magnet school] are unbelievable, but you have the buy-in from the staff, you have the enthusiasm from the staff. They’re very positive about being an arts-integrated school, so when you have that, you have everybody on board and the understanding is there. I think our colleagues would want to tap into that for sure.”

In the music educator focus group participants cited the fact that there is a high turnover rate for administration in the district. Having the support of administrators for the instrumental program, especially regarding scheduling and funding, is crucial. Therefore, if a new administrator is placed at the helm of a school and that person has an unsupportive mindset, it can cause major setbacks for the instrumental program. They recalled a time when this had happened in recent history and the years that it took to recruit and teach student musicians after significant enrollment drops. They also voiced understanding of the priorities that are tugging at administrators stating, “This [instrumental music] is a very small piece of the puzzle. So I think that a lot of times upper administration is looking at the larger pieces and trying to figure out how we can put those together to get improvements in test scores.”

Music educators expressed that having the support of non-music educators is important. They believe that in school communities where they are afforded that support and cooperation, instrumental programs grow and thrive. They similarly expressed understanding of why other educators may not be as supportive as they would like stating, “I can also see where classroom
teachers, grade level teachers, they may be looking at their jobs. If a principal is looking at test scores from a previous year and deciding whether or not the teacher is welcomed back at the school next year, I feel like I would not really prioritize band and playing instruments, that would not be high on my priority list.”

ELA teachers candidly voiced concern that students were occasionally participating in instrumental learning during regularly scheduled ELA classes. They expressed specific trepidation that those students would fall behind in ELA due to missed instruction. Interestingly, all ELA educators articulated an ease of that concern after viewing Phase One findings. They directly communicated this by stating, “Well, I won’t be so annoyed anymore when they are pulled from my class. I won’t. I’ll be like, Oh, that’s good for them” and, “I mean, if this helps them, we should definitely be pushing them to play an instrument.” They also noted that their administrators in the past 5-7 years showed strong support for the arts programs. Due to this administrative support they have seen a growth in opportunity for the students in their school. Their thinking was that if all administrators in the district had access to, “This [Phase One] data, they might show increased support.” One ELA teacher concurred stating, “I think that it takes the principals at all the different schools to prioritize what their priorities are and the value added [from instrumental education].”

**Personnel.** Administrators voiced the need to hold steady or increase the instrumental music at their schools to provide more students with opportunity. They spoke proudly of their individual accomplishments in this regard in the face of tight budgets throughout the years. Music educators agreed that increased staffing is needed to provide more opportunities to students. They added that personnel are specifically needed to bring back instruction in orchestral stringed instruments. Stringed instrument instruction was cut 15 years ago and
recently the program was resurrected at one middle school due to increased music personnel and repair and maintenance of the district’s previously owned inventory of over 100 instruments. Music educators also referenced the other cuts to personnel 15 years ago and the expectations of the community for public performance to be on par with pre-cut levels. They asserted that it takes many years to re-build an instrumental program and that during that time it is not possible to produce high level public performance. They also spoke with enthusiasm about the current direction of the instrumental program but noted that tightening budgets are always a cause for concern regarding possible personnel reductions in instrumental music.

Of the three groups, the ELA teachers most emphatically expressed a need for more music teachers. They spoke specifically about the need for at least one more music teacher at one of the middle schools due to class sizes that were over 45 students. Interestingly, they articulated that they planned to request another music teacher rather than the currently proposed technology teacher position that slated to be hired in the next month. All agreed that after the presentation of Phase One data they were convinced that the students needed more opportunities in music rather than another technology teacher. Woven into the sub-text of their preference was their belief that STEM education (i.e. science, technology, engineering and mathematics) was over emphasized in our schools in recent years. They also spoke broadly about the need for more personnel because they felt that more students should have the opportunity to learn instrumental music. ELA teachers expressed the desire to have string instrument instruction reactivated in the other two middle schools. They saw this as opportunity for students to begin instrumental instruction at the middle school level if they could not in grades 4 and 5.

**Time/scheduling.** This sub-category is linked with the number of personnel available at each middle school but many participants articulated specific beliefs associated with scheduling
therefore, it is a separate sub-category. Administrators expressed that scheduling that allows for students to continue instrumental or vocal instruction is important. They did not believe that scores on standardized tests would increase due to increased instructional time in ELA and mathematics if it were at the expense of decreased time in unified arts subjects. They cited negative changes at the high school level two decades ago regarding scheduling. These changes to the block schedule that has since been reversed, excluded high achieving students from taking band because they needed to be scheduled in to Advanced Placement and honors level courses. Administrators also noted that creative scheduling of music ensembles (i.e. band and chorus) at the elementary level could work to the advantage of the school community providing opportunities for common planning time etc. Similar to the discussion about personnel, these administrators spoke about their personal efforts to provide opportunity for students to participate in instrumental instruction through their scheduling decisions.

Music educators felt that they could provide more opportunity to students if there was more time allotted in the schedule. They talked about the district lacking adequate music education due to lack of personnel and scheduling at the elementary level. Although increases in time and personnel has occurred in the past decade, two thirds of the elementary schools have general music scheduled every other week rather than as a weekly occurrence. They noted that that during the last school year it was proposed to move to a weekly elementary music schedule through increases in personnel but due to budget constraints it was not possible. Their hope was that decision makers would enact upon this budget increase in subsequent years. They believe that an increase in foundational music knowledge at the lower grades will create instrumental students who persist in playing an instrument in the upper grades.
Music educators also spoke of the need for increased small group instruction with like instruments in the upper grades where students are currently taught in large groups of mixed instrumentation. Music educators spoke adamantly about the importance of secondary level scheduling being driven by student choices, such as their desire to continue band. Interestingly, over the past five years, the band teachers at every middle school have gained expertise and skill with the scheduling software program. Therefore, each middle school band teacher is trusted by the administration to be on the master scheduling committee and oftentimes personally oversees the input of student schedules. They also spoke passionately about the need to keep instrumental lessons in the school day. They reflected on administrator scheduling decisions that relegated music ensembles to an after-school only activity for a period of time. Collectively they stressed that due to the many barriers for urban students (e.g. lack of transportation, dangerous conditions for walking home alone, working parents, childcare of younger siblings and the need to work in the teen years), an after-school only band offering caused dramatic declines in student participation in the instrumental program.

ELA educators expressed a belief that more time is needed for students to participate in instrumental classes. They expressed the same observation as the music educators that an after-school only offering caused a decline in band enrollment stating, “A couple of years ago they had to just do band after-school where, it didn’t work... overall, it was a very difficult thing.” At the middle school level instrumental classes are currently scheduled as a separate class but in some districts it is a ‘pull-out’ from a pre-existing class. ELA teachers reiterated that ‘pull-out’ scheduling that removes band students during scheduled ELA time causes stress for ELA teachers. This is especially true in the spring when the concert season coincides with the state assessment window. They stated, “It is a bit of an inconvenience when they are pulled. They are
not pulled often, but when they are it seems like a pivotal point in the year...we already feel stressed and ‘behind the eight ball’ so when they are pulling them for the spring concert it is like, Oh my God it [testing] is next week and we don’t have enough time.”

**Number of free instruments.** It is important to note that this district has large inventory of free loaner instruments that students can use. This inventory is unsurpassed by any other district in the state. A top state arts education official in a personal communication to the researcher confirmed this fact. Each year the district provides between 250-300 instruments to beginning students who are supported throughout their education if they continue to play. The total number of instruments owned by the district and loaned to students in any given year is between 1,400-1,600 instruments. Administrators recounted the progress that had been made in the district regarding increasing opportunity for students through increasing access to free instruments. One stated, “I only know what was happening here and that the work that was being done here was significant because each year we had an increasing number of kids who had access to instruments free of charge.” Administrators acknowledged that the district has many free instruments for students to use but suggested that there is not enough. They spoke of students being on a waiting list for instruments. They used the terms, “problematic, unfortunate, still not enough,” and, “significant” to express the need for more instruments so that more students could participate. They conveyed that other urban districts could have similar test scores for instrumental students if they were offering the number of students the same opportunity. Administrators articulated that although they have a large number of instruments available in comparison with other places, it was not nearly enough to fill the need.

Music educators expressed similar sentiment as administrators as they agreed with the following statement, “And, I think we were really fortunate to have a lot of free instruments that
we give our kids. But, it's just heartbreaking when you get all of this interest and you just don’t have enough instruments to go around to provide the same experience for everyone. And they come from a family where maybe their parents can’t rent an instrument or they can’t buy an instrument so it’s tough and makes it hard.” Although all focus groups expressed the need for more free instruments, as evidenced above, the music educators spoke eloquently about actual instances of knowing the need but not having enough to provide for all. One continued, “I like to not turn students away who want to play an instrument. That’s probably the hardest part, is telling a kid I’m sorry, we ran out of instruments. You did not make the lottery.”

The ELA educators agreed that resources should be diverted so that more students could play instruments. Individually they had a limited understanding of the lottery process at the elementary level but noted that they know of instances when students were not afforded the opportunity to learn due to an instrument shortage. One ELA educator added to this stating that she witnessed ‘at-risk’ students becoming disengaged when they did not receive the opportunity to play an instrument while peers were allowed to be involved. She stated, “I think that you’d see more ‘bang for your buck’ with kids more engaged with band in our classrooms if you had more instruments.”

(2) Reference to: ‘at-risk’ students/urban district. A common thread among all three groups was multiple direct and indirect references to students who are ‘at-risk’ of academic failure. The groups acknowledged that many ‘at-risk’ students are enrolled in the district and thus referenced the possible effect of music instruction on this population. These students come from demographic groups that have risk factors associated with low achievement. Risk factors include families of low income/low socio-economic status, minorities, English language learners and students with disabilities. The participants referenced their perceptions, beliefs and values
concerning this group of students that is usually larger than average in urban centers. Regarding the district in this study it is interesting to note that in three of these demographic areas longitudinal data displays an upward trend that is far above the state average. (Appendix G)

Administrators acknowledge that large numbers of students in the district are considered ‘low income’ and receive free or reduced price lunch. They stated that the district reached a threshold of overall poverty and therefore every student in the district receives free lunch. Administrators stressed that for urban students whose families cannot afford private instrument lessons or rentals of instruments, the program that the district currently offers is the only opportunity that they have to learn how to play an instrument. One summed it up stating that if decision makers, “...cut these programs, it’s a huge disservice to the kids, and they have to be very smart about where they’re going to cut, because this is their only shot.” Furthermore, by the district providing these resources for disadvantaged students it sends a message that, “We want you to have this opportunity, because this could be the key to your life. This could very well be the thing that helps you build your confidence.”

The administrators spoke convincingly about the social emotional learning that takes place as part of instrumental instruction. They spoke about taking safe risks and building confidence. Personal and professional stories were recounted of students that courageously weathered public performances and ‘grew taller’ after praise of their accomplishments. One administrator asserted, “Studies go back years about why kids become involved in dangerous behaviors, because they lack that ability to internally value themselves. For our kids here, it is that opportunity to, within a kind of a comfort area, take those risks. And these [activities] are when kids will take risks. I just want them to take positive risks.”
There was also robust conversation in the administrator group about seriously looking at the arts as part of a turnaround model for underperforming schools. Citing the success of the arts magnet school one administrator offered, “If we do this [increased arts education], this is what we can expect to happen [high student achievement]…Now, did it happen overnight? No, but in two short years it has turned itself on its head. So they actually have moved much faster than turnaround schools are projected to move…It’s a tough choice because it’s a different choice [to increase the arts]. It’s not safe to take that risk, and as you know, most districts that are at level 4 or 5 don’t want to go outside the box. There’s a very specific strategy for being a turnaround school.”

Music educators also spoke passionately about their work with ‘at-risk’ students. They expressed that they have an opportunity to, “change a lot of kids lives in the district,” by involving them in instrumental programs that they otherwise would not have access to due to barriers of poverty and language. They talked about “seeking-out” students who may need this opportunity. Also, they commented that they have seen an increase in recent years of low-SES/low income students and ELL students who chose to join the band program. Moreover, they specifically noted the fact that students who are ELLs may be frustrated with verbal communication but can easily find success through playing an instrument. Similar to the administrator group, the music educators spoke about the confidence that is built through instrumental music instruction and how important that can be to ‘at-risk’ students who need positive experiences. They continued this thought stating that in music ensembles students experience a “second home” which can be a refuge in an otherwise chaotic life. One added, “One of the things we forget, is the hardship these kids have and especially the ‘at-risk’ students. What they face in their daily lives. The music program is an outlet for that. It gives them a place
to feel safe but also a place to get some of that out. Some of those negative feelings. Something that happened at home when their day is ruined but then they get to band and all of a sudden, it’s OK. And that’s one of those intangibles about music programs.”

ELA educators spoke to the “enriching” nature of instrumental programs and agreed that the positive effect of playing a band instrument would be more pronounced in the ‘at-risk’ population. They did not mention the positive effects on social emotional learning for students who are part of the instrumental ensembles. They did offer their perception that other students look to the band students as positive role models especially when they see them in performance.

(3) Basis for perception, belief, and values. Participants in all three focus groups candidly shared their thoughts on various topics. They were provided the research questions at the beginning of the session so they knew that the researcher was interested in learning about their perceptions, beliefs and values. Unsurprisingly, they shared information on this often through direct statements and stories that provided insight into their thinking. After first and second cycle coding some sub-categories in this theme emerged. The findings for these sub-categories related to perceptions, beliefs and values are discussed in the next sections.

Belief: based on research. Participants in the administrator group cited educational research as a place that they drew their beliefs. They were interested at the onset of the session to know about the studies that the researcher used in the literature review and interested to know about the Phase One data analysis. Noting that all three had advanced degrees with two of the three holding doctorates in education, their reliance on research to fuel their beliefs was not surprising. The major research topics that they referenced were those about ‘at-risk’ youth, student engagement through co-curricular activities, and, brain research on learning. When presented with the Phase One data analysis one administrator remarked, “Statistics don’t
lie…these findings are significant to support that schools should be offering instrumental music programs to kids.”

Music educators also frequently quoted educational research during the focus group session. They cited recent brain research on the connection between playing a musical instrument and learning how to read. Additionally, they spoke about articles that they had read that indicated that successful people (i.e. high earners, those in the medical field etc.) also play a musical instrument. They perceived that “more of the brain” was used when playing an instrument thus making transfer to other domains possible. Prior to being presented with the Phase One data analysis, the group joked that they hoped that difference was found because it would be a good advocacy tool to highlight the importance of their work. When asked about their value of music instruction they echoed that it was “invaluable” and jocularly admitted that the researcher shouldn’t have expected a different answer. They also commented that only “research, facts and proof” to the contrary could alter their perception, belief or value of music instruction regarding its ability to foster student success in ELA.

Educational research was only discussed briefly during the ELA educator focus group. They initially offered the perception that they thought that music instruction was more closely linked with achievement in mathematics. As the session progressed they also referenced current brain research with music therapy for athletes who experienced concussions. One ELA educator commented at the end of the session, “This is exciting. I mean this, seeing those standards [with increased achievement for instrumental students]… First of all I’m shocked, and second of all I’m amazed. We really do need to do more with the music. And, it seems to me like it would be in a way, less expensive than some of the things that they are putting into place to address [achievement].”
**Belief: based on personal experience.** Every participant in each group offered personal experiences from which they based their perceptions, beliefs and values. The administrators recollected multiple professional first-hand experiences with instrumental students spanning the course of their career. They also spoke at length about the experiences of their own children and grandchildren. Their professional and personal experiences seemed to be weighted equally regarding how their values for instrumental music were formed.

The music educators naturally spoke about their professional experiences teaching music with accounts of individual students and groups of students. As self-proclaimed “music/band kids” they spoke at length about their own experience learning how to play an instrument and how that shaped their beliefs and values on the topic. In response to the group consensus that “research, data and hard facts” could change their beliefs or values one music educator offered an alternate idea stating, “I don't think it would be easy to change my opinion even if I’m [presented] with facts. Just because I’ve been doing it, I’ve seen it with my own eyes. Seeing is believing.”

Collectively the ELA teachers had very limited experience playing an instrument whereas, only one had played for a year as a child. They were not well versed in educational research pertaining to music. Therefore, they drew on their professional and personal experience as a source to articulate their perceptions, beliefs and values. They referenced students that they had in class as well as their own children, grandchildren or close relatives. This group in particular cited examples about their close family members. Interestingly, they noted that the presentation of research from Phase One had altered their perception, belief and value of instrumental music instruction significantly.
(4) Perception: relationship between ELA and music. This theme was also persistent through the focus group sessions due in part to the series of questions presented. An inductive process (Creswell J. W., 2009) or bottom up approach was used to analyze the data and identify emerging patterns of themes. Because each transcript was analyzed separately on the first coding cycle, some patterns only emerged in one or two focus groups. Nevertheless, the information expressed was salient and therefore warranted a separate sub-category. As stated in the participant demographic section, the administrators had the most collective and individual experience; they often referred to their direct experience with the topics presented and also made connections with their personal experiences with their own children and grandchildren. Although the administrators spoke at length about higher overall student achievement for students who play a musical instrument, they also commented that music was a language and therefore increased reading abilities for instrumentalists was plausible.

Overwhelmingly, music educators expressed the belief that a relationship exists between playing a musical instrument and increased achievement in ELA. All agreed that students who persevere in playing an instrument for five years have a higher likelihood of achievement in ELA. They spoke to their perception that music reading was akin to reading in literacy. They noted that students in their band classes had indicators of high achievement such as high participation in eight grade/high school dual enrollment classes, participation in national honor society and proficient or advanced designations on their MCAS scores. The music educators shared perceptions, beliefs and values that were based on their experiences with students. Their own experiences learning how to play an instrument as well as those of their family and close friends also featured prominently in their answers. At times they discussed current research on the topic. A good amount of their thought process centered on the way in which students learn to
play an instrument, how music is a type of language and the skills that one acquires as they become a musician. Being able to articulate the above allowed them to have a deeper discussion about why a relationship is possible between achievement in ELA and playing a musical instrument. As stated, when asked if there was anything that could alter their perception about instrumental music instruction and achievement in ELA beliefs and or values about the topic they agreed that only clear data indicating otherwise could lead them to believe differently. They also noted that the Phase One data presented, “reinforced their thinking,” regarding playing an instrument and an increase in achievement in ELA.

The ELA educators entered the focus group session and almost immediately expressed a desire to know the outcomes of the Phase One data analysis. They expressed that they perceived that there was a relationship between increased ability in mathematics and playing a musical instrument based on research studies that they heard about but that they saw little to no connection to ELA. They asserted that they were curious about the topic, which is why they answered the ‘Call to Participants’, and joined the focus group. During the course of the focus group the ELA educators increasingly voiced personal experiences that could support a connection between ELA and instrumental music playing. They drew mostly from personal experiences with their own children who played an instrument or a close family member or friend.

Like the music educators, the ELA educators said that data, especially data from students in the district, could alter their perspective and thus their beliefs and values toward the importance of instrumental music. The statements that were expressed at the beginning of the focus group session were very different than those expressed at the end. They communicated an increased value of instrumental instruction through statements like, “This is exciting... I’m
amazed and we really do need to do more with the music,” and “I can give you a personal view, my daughter is in fifth grade and she’s been doing piano since first grade and we let her stop...but I can tell you after this [focus group], she’s going right back to piano.”

**Difference.** As a group, the ELA teachers’ initial perception was that there was little to no difference between students who played a musical instrument and those who did not regarding literacy achievement. They expressed that they realized that “band kids” were usually high achievers by the number of them that were in advanced placement or advanced learning (i.e. gifted and talented) programs of study. One teacher articulated that she gained this perspective through conversations with other teachers when she expressed concern about and students missing ELA class. She said that they stated to her, “Those are the band kids. They’re all doing well in English so I’m not too upset about it.” At the end of the focus group session the ELA teachers conveyed a strong belief in a difference between playing a musical instrument and achievement in ELA stating, “Well, I won’t be so annoyed anymore when they pulled from my class…I’ll be like, “Oh, that’s good for them.”

**Questions about other factors for difference.** All three groups expressed that they would like to see the data on ELA standardized test scores and instrumental instruction broken down further to illustrate sub-groups of ‘at risk’ populations such as ELLs, special education and low-SES/low income. During the ELA educator focus group session, they grappled with other possibilities for the difference beside the practice of playing an instrument. They voiced the possibility that instrumental students were already academically inclined prior to playing an instrument, that the parents of these students could readily afford instruments and therefore, they had the opportunity, or, that perhaps their persistence in the program was a product of parental support. On each occasion that a participant provided an alternate rational, another participant
refuted it with description of personal or professional first hand knowledge. The dynamic of the group was interesting because the researcher could witness perceptions being changed through group discussion and new beliefs being expressed based on the stated experiences of colleagues.

**No difference/or difference for math.** The ELA educators initially stated perceptions like the following about instrumental instruction, “I always assumed that it was helpful for math, to increase math scores,” and “My general perception is that it wouldn’t have any effect on their literacy at all.” By the end of the session the statements were, “It’s interesting…it makes sense though when you think about it…You know, there’s some kind of connection [with math]. But this [ELA connection] didn’t occur to me I guess.”

**Possible explanations for difference.** Administrators offered some possible explanations for their belief that there is a difference between playing an instrument and ELA achievement. They cited that music was a language and that in reading musical notation, the brains of musicians are stimulated differently. They chose to comment on specific aspects of the Phase One data analysis. They zeroed in on thoughts pertaining to why there was not a significant difference in Student Growth Percentile (SGP). Their belief was that because band students consistently scored higher than peers, high growth scores would be hard to obtain. One stated, “It’s like somebody who had a 99 before. They can only grow 1%. There’s not a whole lot of room to grow… I would think that for those [instrumental] kids the growth would be hard, and maybe that's why it’s a little lower.”

Music educators also seemed unfazed by lack of difference with the SGP stating, “That makes sense,” and “I'm not surprised.” Some areas that did show difference were discussed as also making sense to the participants. This included drawing similarities between the skill of identifying key ideas and details in reading passages and the work of a musician to hone details
of musical performance. Or the similarity of vocabulary acquisition in ELA and the abundance of “musical vocabulary” needed to play an instrument. Music educators commented about students making sense of musical vocabulary, using roots from the Italian terms and transferring knowledge of descriptive musical words to ELA class.

Educators in the ELA focus group came to the same conclusion as the other groups regarding the lack of difference with SGP. They stated, “I was thinking that these kids are so high anyway. Maybe it’s hard to get higher growth? They’re not going to make huge leaps because they’re already at the top.” Similar to the music teachers, ELA teachers noted the skill that musicians gain in noticing and reacting to details in music. They offered examples such as, “chord changes” and being more “keyed into how the music changes.” Furthermore, they agreed that it makes sense because, “It [music] is a language. You know, it has it’s own vocabulary. They say it’s the universal language and so it would make sense that they would be better at vocabulary acquisition. They’ve already learned a whole new language.” As a group they agreed that the standards Key Ideas and Details and Vocabulary Acquisition are difficult concepts to teach and areas where students struggle. Therefore, they saw the potential value in boosting these scores through instrumental instruction.

**Vocabulary/language.** Music teachers commented that musicians are able to communicate more effectively than non-musicians. Speaking about their own music making and listening to others musicians in the context of the changing aspects of musical sound (e.g. pitch, dynamics, tone) is analogous to speaking and listening in the ELA context. ELA teachers emphasized the language and vocabulary skills that musicians use stating, “It’s things just like staccato and words that I’ve never even heard of. You have to use your inference skills. You have to figure it out. You have to decode it. So I think they are using the same skills.”
**Reading.** With specific mention of reading, one administrator recounted the progression to proficiency that her son has experienced during the time that he played an instrument for several years. She believed that through learning to play the drums he was reading music and possibly strengthening his reading skills. Another agreed with this assertion basing her perception on the fact that her granddaughter is a prolific reader and has been in the band for many years. Music teachers believe that if a musician learns to play by rote they will not receive the full impact of a difference to literacy because they are not ‘reading’ the notes. They also agreed that they believe that music students have more background knowledge to draw upon when answering literacy questions on standardized tests. The notion that music is a language and therefore the notation is being ‘read,’ made this aspect of literacy transfer an easily agreed upon belief in all focus groups.

**Listening.** One music teacher quoted brain research during the focus group that led to his beliefs regarding the value of music education for ‘at-risk’ students. Without directly citing the article, he alluded to the research about “speech-in-noise perception” (Parbery-Clark, Tierney, Strait, & Kraus, 2012, p. 116) that is referenced in Chapter Two of this study. There was consensus in the group that this research was plausible as a possible reason for urban music students to achieve in literacy.

**Belief: Band students have higher achievement.** Each focus group articulated the belief that students who are involved in instrumental instruction have higher achievement in general. Administrators articulated it decisively stating, “Band kids pretty much rise to the top,” and, “There’s no question in my mind that kids who participate in music and continue that through those five years or more become real successful in life,” and, “Kids engaging in band would do better than their counterparts who aren’t in the band in the end.”
An unequivocally articulated belief by the administrator group was that students who are regularly involved in athletics achieve at equally high rates to instrumental students. The fact that students are “involved in a focused activity” is what they believe is helping young people to develop. They noted that students need to find a suitable activity that piques their interest and that only offering one type or the other would be a disservice to the students. All agreed that it is through the experience of co-curricular activities like musical ensembles, students learn the skills to be successful. One offered this statement, “Research has indicated that co-curricular activities have this characteristic called “holding power,” which engages kids more actively in their education beyond the classroom day. And, those kids usually have better organizational skills, better time-management skills, become leaders in other capacities within the school, can do all these things and hold a job, and always seem to be ... If you want something done, ask a busy person kind of adage.” This group based their belief on anecdotal evidence of cohorts of children over the course of many years. One mentioned that she had seen data analysis on the school level that was similar to the Phase One analysis in this study. The school-based data had the same results indicating that students involved in the instrumental program had high achievement on standardized tests. They also mentioned their perception that instrumental students consistently attend “top-notch” colleges upon graduation that is a testament to their ability to achieve.

The music teachers expressed that their belief was also based on the cohorts of students whom they have taught as well as their peer group when they attended secondary school. They cited the fact that their current instrumental classes are composed of disproportionate amounts of students on honor roll, getting high GPAs, participating in Honor Society and dual enrollment. Due to the fact that music educators were previously “instrumental students” at school, they
frequently drew from their own experiences. In this case they noted that there was a high percentage of “band kids” in the top 10 of their graduating class. They also came to the same assertion as administrators of the belief that oftentimes-instrumental students are also highly involved in athletics, drama or other clubs.

The ELA educators also expressed a belief that instrumental students have higher achievement compared to their non-instrumental peers. They recounted large numbers of students in their high level courses being ‘pulled-out’ for instrumental lesson or rehearsals. They spoke about close friends and family members who played instruments being, “very, very smart intellectually,” or even classified as “brilliant.”

(6) Belief: Band builds skills for success. Music educators agreed that student musicians learn many skills for success that can transfer to most types of learning. One that they cite as important is the ability to focus for long periods of time and focus with the intent to respond immediately through playing. They also felt that music students “learn how to learn” through good practice habits that allow them to apply the same skills to novel situations in order to learn new music or improvise with new sets of people. Similarly, taking ownership of your own learning and goal setting were also discussed as learned musical behavior. One teacher stated, “I think part of that is that they can feel immediate success. In so many other things they don’t get the immediate benefits because [in music] they can tell if they played something correct. They know if they have played it right so they immediately know that they know it. They’ll be happy if they’ve achieved the goal. Like you said before, even if it’s a small one. It doesn’t have to be a large achievement for a kid to be a positive experience.”

(7) Value: Indirect results of participation. The ‘indirect’ results of participation in instrumental music instruction are those results that both non-musical and not a direct intended
outcome of music instruction. Participants articulated value of three areas that fit into this category.

**Value: school culture/planning.** During the administrator focus group, at times participants spoke specifically about instrumental music but also provided insight that encompassed broader categories such as all music (i.e. instrumental, choral and general music), ‘performing arts’ (including drama and dance), ‘arts’ (including visual and media arts), and ‘unified arts’ (including physical education, technology, library education etc.). Thus, the administrators often saw instrumental music as part of a larger group of classes taught by specialist educators. This categorization was prominent in their articulation of their values concerning school culture and school-wide improvement efforts. It is interesting to note that this was not one of the specific questions during the focus group but the consensus views expressed are worth mentioning as part of the value system for administrators. In speaking about the value of music and the arts, they referenced personal beliefs that “unified arts teachers” can positively affect the climate and culture of a building through their work with students. The community building in instrumental ensembles, and providing an outlet for creativity was mentioned alongside the nature of school concerts to bring parents and community members together. In this regard they also spoke about the usefulness of “unified arts” scheduling that allows for common planning time for teachers of other subjects and the large number of students that can be placed in music ensemble courses thus bringing down class sizes elsewhere. One stated, “If our colleagues look at this data and they see it as a win-win situation. While my students are at fine arts, they’re at the music program that provides time for me to plan more effective lessons. It’s a win-win for everybody.” One last point that administrators stressed regarding their value of the “unified arts teachers” was that at times these educators are underappreciated. Each stated that
they personally made an effort to ensure that all educators in their buildings were on equal
ground.

Value interdisciplinary connections. Both administrators and ELA educators articulated
a value of the interdisciplinary learning that may be a result of music education. As was the case
with the administrators’ expressed value of enhancements to school culture, this category was
not part of the standard set of questions presented to each group but rather permeated discussion
throughout the session. Administrators commented on the ability for teachers of the unified arts
to provide instruction in their subject area that has a direct relation to mathematics or English
language arts citing the benefit for students to make cross-curricular connections. The music
educators did not reference interdisciplinary connections as a value that they hold regarding
instrumental music instruction.

In the ELA focus group, the participants spoke frequently about the value that they place
on interdisciplinary connections. They recounted instances when the band teacher brought
cultural instruments into their classrooms or made direct references in music class to literature
that students were reading as a grade level. This group also spoke about connecting with other
unified arts teachers on cross-curricular learning. ELA educators expressed that they valued the
high level of engagement that the students displayed during inter-disciplinary learning and spoke
about a desire to do more of this in the future.

Value: Band as a motivator. As part of referencing the value of instrumental instruction,
administrators spoke of the motivational aspect of instrumental instruction. They recounted
discussions with academically struggling students who were excelling in instrumental
instruction. One stated that he said the following to a student, “I went to see you perform. I was
amazed at how well you did. You must have made a great effort to perform that well. I want to
see that same kind of effort over here, in these [academic] areas.” The administrator continued, “Kids start to say, hmmm, this person cares about me. They recognize that I worked hard. They watched me perform. They’ve acknowledged it. They’ve also said, if I can do it here, there’s a great possibility I can do it here.” In the same regard, they also spoke about the importance of music teachers speaking about student motivators and sharing strategies to motivate underperforming students with their grade level counterparts. They noted that sometimes affording students to excel in other areas gives them the confidence needed to put forth their best effort in all areas. Also, administrators asserted that experiences in band could serve as a powerful intrinsic motivator for students to experience success from hard work and perseverance.

ELA teachers spoke more about the experience of band being an intrinsic motivator for students to attend school stating, “I have nephews that were ‘at-risk’ and the music has really been the motivator for them to get good grades and to study and to really – go to school. Because they, they weren’t ‘school oriented at all’ until the instruments came.” They also recounted conversations with underperforming students saying to them, “Come on, your grades aren’t doing so well, so you know you want to go to the concert and you want to be able to participate.”

(8) Value: Providing opportunity. Administrators spoke passionately about their philosophical stance that urban public schools should be providing opportunity to “develop the whole-child.” They valued that through instrumental instruction, children were developing more aspects of their intelligences (Gardner H., 1999) that could not otherwise be addressed in the other subjects. These administrators spoke adamantly about their personal advocacy efforts in the face of past budget cuts to the instrumental program citing times when they addressed the
school committee and upper administration to defend their decision to keep instrumental music in place at their respective schools.

Music educators noted that the current offerings in the district provide opportunities for students of low-SES that would not be available if not provided by the district. They also noted that they personally look for new ways to provide hands on playing opportunity that will engage students. This includes reactivating the string ensembles as well as offering non-traditional instrumental ensembles (e.g. ukulele, mariachi and world music drumming) and a variety of instrumental based courses (e.g. piano class and guitar class).

(9) Planning for Next Steps. During each focus group the participants spoke with conviction about their beliefs and values. The atmosphere in each session was collegial and relaxed. There was also a sense that the conversation had both meaning and importance. Participants were polite about conversational turn taking but also spoke over each other when excited or engaged. While at times, they offered differing viewpoints; they also allowed the thoughts that were expressed to influence their thinking. One very interesting facet of the group discussion was that during each focus group the participants discussed possible actions that they could take to advance their values regarding instrumental music instruction.

In the administrator focus group the participants suggested that the data from Phase One of this study and future disaggregated data on ‘at-risk’ subgroup populations would be important for their school communities. They also felt that the central office administration and their principal-level colleagues in other schools should closely examine (1) what is happening in the instrumental classes that are creating high achievement, (2) the success of the arts magnet school and (3) the habits of the high achieving students in general to see how that success could be replicated.
Music educators expressed, “We need to continue to advocate for it, making sure that people know about our programs, not just the parents but the teachers and administrators in the buildings that might be able to give us a resources.” In addition to continued advocacy, a next step that they expressed was to offer greater and varied opportunities for students to play instruments. They stated that the data from Phase One, “Just affirms my belief that we need to continue to push for instrumental music... we’ve talked about providing even more instrumental, nontraditional ensembles like guitar ensemble, piano classes, drumming classes, whatever it may be so that hopefully we can expand how many kids actually do this. Because if this is the kind of difference that we’re getting then I think that we should keep going. And I’d love to be able to show this [Phase One data] to as many people as possible.”

The ELA teachers expressed the greatest change in their collective perception of the connection between ELA and instrumental music learning. During the session they offered many possibilities for next steps that would support more students participating in instrumental instruction. By the end of the session they all sincerely stated that they valued instrumental instruction during the school day for urban youth based on the data presented from Phase One analysis. Similar to the administrators, they thought that it would be useful to have data disaggregated by sub-group and also to have demographic data for their students each year that designates students’ individual interests. The intent of this is so that teachers can get to know their students and direct them into greater participation in co-curricular activities.

While some of their expressed next steps concerned inter-disciplinary planning and coordination with the music teachers, some of their other suggestions were specific to increasing access and opportunity to play musical instruments. They stated that as a school community they should do more to encourage students to participate or persevere in music ensembles. One
simply said, “I mean, if this helps them, we should definitely be pushing them to play an instrument.” As stated earlier, one ELA teacher went so far as to declare that she was going to allow her daughter to quit playing an instrument but now had a change of heart on the topic. By the end of the session the ELA group believed that sequential music instruction is a possible preventative measure and they valued being “proactive” so that perhaps they would need less “re-teaching and summer school.” They expressed that they were going to approach their principal to make sure that she knew about this data and to advocate for hiring an additional music teacher at their school.

**Phase two data analysis and findings – summary.** The Phase Two data analysis and findings illustrate the perceptions, beliefs and values of three different types of educators regarding students who play a musical instrument and their achievement in ELA. The findings point to many areas where there is convergence among the thoughts of the three groups. Other areas offered variation and distinct differences between the groups of educators.

**Summation**

With the purpose of understanding how playing a musical instrument for five consecutive years relates to measures of literacy achievement for urban middle school students, the findings from this case study illustrate data relevant to the central question and sub-questions relative to uncovering the perceptions, beliefs and values of educators in the studies district. Findings from both phases, (1) an analysis of student test score data from school year 2013-2014, and (2) qualitative coding analysis from three focus groups of educators, provided in-depth insight into the topic.
Chapter Five: Discussion of Findings and Implications for Practice

The problem of practice that this study seeks to address is the diminishing occurrence of music education in American public schools due to value-based decisions that weigh subjects on high stakes testing heavier than non-tested subjects (McMurrer, 2008; Heilig, Cole, & Aguilar, 2010). Innovations in neuroscience research corroborate with educator anecdotal accounts that students who play musical instruments have higher degrees of success on measures of literacy and cognitive functioning (Barrett, Ashley, Strait, & Kraus, 2013; Corrigall & Trainor, 2011; Kraus, Hornickel, Slater, Thompson, & Strait, 2014; Miendlarzewska & Trost, 2014). The literature also indicates that music education may help to close the achievement gap for ‘at-risk’ student musicians who score significantly higher on standardized tests, (Kinney D. W., 2008).

The purpose of this study is to understand how playing a musical instrument for five consecutive years relates to measures of literacy achievement for urban middle school students. Furthermore, do the perceptions of educators and administrators about this topic affect value-based decisions regarding resource allocation and opportunity for students in an urban public school.

Research Questions

A. The central question that guides this research is:

How does playing an instrument for five or more consecutive years affect the literacy achievement of middle school students in an urban public school?

B. Sub-questions to probe deeper into this topic include:

• How do educators’ (i.e. music teachers, ELA teachers and administrators) perceptions of the value of music education change (or remain the same), when presented with quantitative data on playing an instrument and students’ literacy achievement?
• To what end do these perceptions affect value-based decisions on the part of administrators and educators about students’ access and equity concerning instrumental music instruction in public schools?

**Limitations of the Study**

The first limitation is in this case study is that the district is exceptional in the number of free instruments that are offered to the students and the historically embedded culture of support for a strong instrumental program. Although this feature makes it a good candidate for case study research because it highlights a break with traditional urban school districts, it is also a limitation because it represents over a decade of resource allocation that is not easily replicated. Other limitations of this study included lack of access to disaggregated data, access to only one reliable measure of English Language Arts and some different demographics in each focus group. Regarding the disaggregated data, in addition to noting if a student was an instrumentalist or non-instrumentalist, it would be ideal if the researcher could identify the students in the sample according to ‘at-risk’ subgroups. This would allow for further analysis that speaks directly to this point. It would also allow for groups that are matched on these factors prior thus eliminating the unbalanced nature of the groups. Although the ELA Massachusetts Comprehensive Assessment System (MCAS) test for eighth grade is a valid and reliable measure of student achievement in ELA, access to data from a similar measure of ELA (e.g. benchmark testing, common assessments or PARCC exams) would make the study even stronger.

Lastly, through the open ‘Call for Participants’ procedure the researcher could not control for the demographics within or across focus groups. To allow for greater participation the researcher sought approval to extend the call to educators of grades 4-8 instead of only 6-8 as originally proposed on the IRB. The thinking behind this was that instrumental instruction
begins in grade 4 in the studied district so it made sense to extend the invitation. These variables resulted in a music educator group that was skewed younger and with less years of teaching experience than the other two groups. While more experienced, the administrator focus group had a smaller number of participants. Also, the ELA focus group consisted of educators predominantly from the same middle school. They did comment on their past experience at other schools in the district including grades 4-8 but their ‘next steps’ comments were indicative to their current school community.

**Research Design Review**

Case study was employed as the primary methodological research design. This is appropriate because the researcher intended to investigate phenomenon in a single urban public school district. Through this investigation both quantitative and qualitative data collection and analysis were utilized so that multiple sources of evidence could be triangulated (Yin, 2014). According to Tellis (1997) a case study is also an appropriate research design when the researcher desires to elicit the viewpoints of the participants.

In Phase One the study utilized data that was previously collected and housed in the Massachusetts Department of Elementary and Secondary Education (MADESE) Edwin Analytics Data Warehouse. Termed “secondary data” by Boslaugh (2007) because it was collected previously for an alternate purpose, the scores of eighth graders who participated in the Spring 2014 administration of the MCAS for ELA were analyzed. The intent of this analysis was to understand the statistical relationship between students’ test scores on measures of literacy and participation in instrumental music classes. To achieve analysis a t-test was used to determine statistical significance and difference of test scores for instrumental music students compared to non-instrumental music students. Prior to running the t-tests, Levene’s Test for
Equality of Variances was calculated so that an assumption could be made for each t-test regarding the “homogeneity of variance” (Lund & Lund, 2013). Eight independent t-tests were conducted on three types of score representations: (1) ways of scoring, (i.e. percent correct, scaled score, and student growth percentile), (2) question types (i.e. multiple choice, open response), and (3) specific literacy standards addressed in the questions (i.e. craft and structure, key ideas and details, vocabulary acquisition and use).

The second phase of the study followed more traditionally qualitative methodology. A series of three educator focus groups were designed to elicit the collective perspectives of administrators, music teachers and ELA teachers. In Phase Two participant demographic data was collected through a background questionnaire (Appendix F). More importantly, the information that the researcher sought was the perceptions, beliefs and values pertaining to instrumental study and the possible difference to literacy achievement. The same standard set of focus group questions were used for all groups (Appendix G) with facilitated clarifying questions when needed. All three of the focus groups had the same agenda that included baseline information gathering, a brief presentation of Phase One data, and a follow-up discussion to gauge if perceptions, beliefs or values had changed based on the presentation.

Focus group transcripts were created from the audio recordings of each transcript. When complete the transcripts were sent to the participants of each respective focus group to assure accuracy. The transcripts were read thoroughly, multiple times to establish working codes categories. Next, the transcripts were uploaded into the qualitative software MaxQDA12 where first cycle coding occurred in this digital platform. Second cycle coding was achieved in the same fashion through which code categories were condensed to form the final major themes presented in the findings.
**Overview and Discussion of Findings**

The findings for this study uphold findings that are present in emerging neurological research. The Phase One analysis showed a strong positive difference between students who play a musical instrument for five consecutive years and those who do not in relation to achievement on measures of literacy achievement. These results directly relate to the central question of the study - *How does playing an instrument for five or more consecutive years affect the literacy achievement of middle school students in an urban public school?*

The results also directly relate to the theoretical framework concerning Dewey’s (2001) theory on the interconnectedness of subjects taught in schools. He supported the idea of transfer of learning from one subject to another as explored in this study between learning to play a musical instrument and literacy. Findings from Phase One support this theory that it is plausible that the learning embedded in playing a musical instrument can transfer to language acquisition and overall achievement in literacy. Findings from Phase Two also support the theoretical framework because educators expressed perceptions and beliefs that students who learn how to play a musical instrument can transfer knowledge and skill to literacy.

In Table 5.1, statistical significance is displayed by scoring category. This table displays that in 7 out of 8 independent t-tests, the instrumental group outscored their non-instrumental peers.
Table 5.1 Statistical Significance by Category

<table>
<thead>
<tr>
<th>Major Categories of Scoring</th>
<th>Statistically significant</th>
<th>Group with higher scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ways to Score</td>
<td>2 out of 3 statistically significant</td>
<td>Instrumental</td>
</tr>
<tr>
<td>Question Types</td>
<td>2 out of 2 statistically significant</td>
<td>Instrumental</td>
</tr>
<tr>
<td>Language Standard</td>
<td>1 out of 1 statistically significant</td>
<td>Instrumental</td>
</tr>
<tr>
<td>Reading Standard</td>
<td>2 out of 2 statistically significant</td>
<td>Instrumental</td>
</tr>
<tr>
<td>Total</td>
<td>7 out of 8 statistically significant</td>
<td>Instrumental</td>
</tr>
</tbody>
</table>

The participants spoke about their perceptions and beliefs regarding playing a musical instrument and transfer to literacy. Each group noted that music is a ‘language’ and therefore they believed that through reading music students were strengthening their reading skills. They also spoke about musicians’ ability to focus on details in music, listen and adjust to other musicians and improve through goal setting. Some also cited brain research that points to a connection between playing a musical instrument and literacy acquisition. They affirmed and constructed their beliefs through reflection on personal experiences. Overall, the Phase One statistically significant data resonated with focus group participants. Taken together, this data points to an assumption that playing a musical instrument for five or more years positively affects the literacy achievement of middle school students in an urban public school.

In the problem of practice section of this study it was noted that across America music education is waning in lieu of increased emphasis on other tested subjects. (McMurrer, 2008) This is due to value-based decisions on the part of educators and administrators (Kelly, 2012). Therefore, it was important to understand the perceptions, beliefs and values of educators
through two study sub-questions.

(a) How do educators’ (i.e. music teachers, ELA teachers and administrators) perceptions of the value of music education change (or remain the same), when presented with quantitative data on playing an instrument and students’ literacy achievement?

(b) To what end do these perceptions affect value-based decisions on the part of administrators and educators about students’ access and equity concerning instrumental music instruction in public schools?

Discussion about themes as they relate to the central question and first sub-question.

The central question and two sub-questions were woven into the line of inquiry throughout all three focus groups. After multiple cycles of coding, the transcripts from these sessions yielded nine major themes that will be discussed in relation to the questions below. Most major themes directly relate to the central question. This means that statements made during the focus groups provide insight to assist in answering this question.

Reference to: District policies/resources. Regarding the first theme: Reference to: District policies/resources, participants across all three groups referenced the fact that district resources are provided to ensure that urban students have access to five years of instrumental instruction. They cited a large inventory of available free instruments but also emphatically decried that more instruments should be purchased to fill the need and level of interest. They also spoke of their distain for past budget cuts when resources were not allocated to this type of learning and of the years of “rebuilding” that needed to take place due to those short-sighted decisions. All groups voiced concern that it is “unfortunate” that the arts are always the “first thing to be cut” when budgets are tight so that funding can remain intact for tested subjects. Administrators spoke passionately about preserving instrumental music in the face of these
value-based, budgetary decisions because they believed that students who participate in “co-curricular” activities would achieve at higher rates than their peers. As is the case with the need for increases in equipment, all three focus groups agreed that increases in personnel were also needed so that more students could have the opportunity to participate.

Upon receiving the Phase One data analysis presentation that indicated with statistical significance that instrumental students who have played for five consecutive years outscore their non-instrumental peers on measures of literacy, the administrators and music educators stated that their belief was affirmed. Due to the fact that the original belief held by ELA educators was that there was no relationship between instrumental instruction and ELA, their response after learning about the Phase One data was unequivocally in support for increases in instrumental instruction funding, personnel and time. All groups stated multiple times that they value instrumental instruction for urban students. Additionally, in light of the statistical data they will intensify their support for more district resources allocated to that end. The last theme highlights the specific “next steps” statements that educators expressed however; each group articulated that they personally wanted to do more.

Reference to: ‘At-risk’ students/urban district. The second major theme discusses Reference to: ‘At-risk’ students/urban district. Questions were designed to explicitly ask for the educators’ views on instrumental instruction and ‘at-risk’ students however, this topic often resurfaced unprompted. Participants overwhelmingly spoke about the need to provide access and equity to urban ‘at-risk’ students. They felt strongly that the district was unique in providing the resources to allow urban students to participate for five consecutive years. However, if other urban districts designed a similar program they felt that those districts would yield the same positive results in ELA. The groups also voiced unequivocal support for increasing opportunity
to the ‘at-risk’ student population because (a) due to income limitations the families could not afford it otherwise and, (b) if instrumental instruction is a catalyst for higher achievement in ELA it would be a worthwhile investment in school turnaround efforts; moreover, a worthwhile investment in the future lives of the students. By the end of the sessions in all three groups the participants expressed their belief that the district should seriously consider increasing instrumental instruction to be offered on a wider-scale as part of the turnaround efforts to increase academic achievement.

*Basis for perception, belief, value.* The information from the focus groups regarding the third theme, *Basis for perception, belief, value,* did not speak as directly to the central question as it did to the sub-questions. One common thread was that all educators based their initial beliefs and values more on personal experience than on research. They spoke about their own experience as a musician, their close friends and family members who play instruments and the students in their classrooms. The importance of having first-hand knowledge of the topic resonated as they spoke from the heart about their perceptions, values and beliefs. What was also interesting to note was the power of discussion and sharing among focus group participants who knew and seemed to respect each other. Especially in the ELA educator focus group it was apparent that the first-hand accounts of colleagues during the session were quickly acclimated by participants and even altered originally held perception, beliefs or values. Each focus group had discussion about educational and neuroscience research that perceptions, beliefs and values were based on. Even though their personal experiences weighed heaviest and peer suggestion clearly altered their thinking, all groups articulated that only ‘hard data’ would sway them. This was the case with the ELA teachers who originally believed that instrumental instruction had no relationship to ELA achievement. By the end of the session they declared that they would
strongly advocate for another music teacher and “sell” the virtues of the instrumental program to students in an effort to increase literacy achievement for their urban school. One went so far as to state that she was going to reverse a recent personal decision to allow her daughter to quit playing the piano in light of the new information.

Perception: Relationship between ELA and music. A wondering throughout this study is if the adage “perception is reality” has any bearing on educators and their thoughts about instrumental students. This is reflected in the sub-questions but also speaks directly to the central question in relation to the fourth theme, *Perception: Relationship between ELA and music*. This is because the participant statements give voice to the thinking of the educators on this topic. They grappled with their initial beliefs about a possible difference, discussed reasons why the results occurred, and re-affirmed or articulated newly held beliefs that there is a difference between the instrumental and non-instrumental groups regarding ELA achievement. Concisely, administrators and music teachers believed at the outset of the focus groups that a positive difference for instrumental players would be present. Administrators generalized this difference to all students who are “involved” which included instrumental students, athletes, thespians etc. Administrators did attest that music is a language and therefore they believed that reading skills could transfer to achievement in ELA. Music educators agreed with the sentiment about students who are “involved” becoming more academically successful. Also agreeing that music was a language with reading notation as a major part of the skills set, music educators cited more specific attributes about learning how to play a musical instrument that can contribute to bolstering literacy skills. These included pitch discrimination and a heightened ability to listen, hyper-focus on details, the ability to creatively communicate a musical thought through expression, and a command of a breadth of music related vocabulary and background
knowledge. As stated, these two groups did not change their initial perception, belief or values after presented with Phase One data analysis.

The ELA teachers however, had a complete change. They expressed an initial perception that music instruction had no difference to ELA. They believed that instrumentalists were more likely to have strengthened mathematics skills. It was only after the presentation of Phase One data analysis and through discourse during the focus group that their perception, belief and value on the topic changed. The ELA group seemed to have moments of realization and insight about the difference that they articulated in statements such as, “It’s interesting…it makes sense though when you think about it... didn’t occur to me I guess.” This information speaks to possible implications for future research that will be explored in a subsequent section.

**Belief: Band students have higher achievement.** The fifth theme, Belief: Band students have higher achievement, is a sentiment that cut across all three focus groups and speaks to the central question. All educators expressed the belief that band students were high achieving students. They recounted many personal and professional experiences with instrumental students who were in advanced coursework, honor societies, had high achievement on standardized testing, were among the top academic students in their class, or, were accepted to elite universities. Like the “perception is reality” adage, a second wondering is if the belief that band students are high achieving students somehow creates a self-fulfilling prophecy? Is it through adoption of the identity of ‘band kid’ that students also adopt the identity of ‘good student’? All three focus groups referenced the ‘band kids’ when they spoke about their positive attributes. The administrators and music educators also expressed that students become immersed in the culture of band as they begin to take on this identity. The administrators contributed the academic success of band students in part to “positive peer relations.” They contend that
especially at the middle school level, the influence of one’s peers is paramount. The music
teachers added to this idea stating that music ensembles become “like a second family” whereas,
not only do students learn positive behaviors from each other but also through positive relations
with adults. They noted that with urban, ‘at-risk’ students, developing a reliable support network
and trusting adult relationships is vital.

The ELA teachers alluded to this idea of a self-fulfilling prophecy but questioned the
direction of the relationship between participation in band and academic success. Rather than a
flow from participation in band to academic success, they wondered if academically gifted
students were gravitating to instrumental music study? Or, as an extension of this thought, if the
students who participate in instrumental instruction are doing so because they have parental
support at home and thus, are also expected to do better academically than peers who do not have
parental support? During this debate other participants contended that they had first hand
knowledge that parental support was not always present for high achieving eighth grade
instrumental students. They also stated that they witnessed students participating in instrumental
programs at the elementary school who were not all considered advanced. Other than the line of
inquiry that was resolved through discourse, the general belief of ELA educators mirrored the
other two groups. Whereas the administrators and music educators held steady in their belief,
the consensus of the ELA educators changed to all believing that band students have higher
achievement.

**Belief: Band builds skills for success.** While the previous theme speaks to the belief that
instrumental students are academically advanced, the sixth theme articulates the educators’ idea
of why this may be the case. Most of the educators relied on first-hand experiences to construct
their perceptions and beliefs. They articulated their *Belief: [that] Band builds skills for success.*
They spoke in practical terms that participation in an instrumental ensemble helped students to learn time management and organization skills. One administrator mused that band students were busy people due to rehearsal and events therefore, the adage, “If you want something done, ask a busy person” relates to band students’ ability to complete necessary requirements for academic success. Focus group participants also recognized that students who are involved in musical ensembles learn the importance of collaboration and teamwork. The music educators reflected on the fact that instrumental students learn how to focus for long periods of time. Also through playing music they have a mechanism to receive immediate feedback, learn how to set goals and feel success when those goals are achieved. The participants in the focus groups did not waver or intensify their belief after the presentation from Phase One findings.

Value: Indirect results of participation. The seventh theme, Value: Indirect results of participation, did not directly relate to the central question. These statements concerned topics such as: the value of inter-disciplinary lessons and the benefit of musical ensembles on school culture/climate. The only direct connection to the central question was the articulation that participation in instrumental music can be used as a motivator for students to keep their grades up or attend school when they may otherwise not choose this path. This theme did not cut across all three focus groups with no codes in the transcript of the music educators. Music educators, who most often spoke from their own experience learning how to play instruments, made more direct references to musical learning including the benefits of this learning. Therefore, it is not surprising that they did not articulate a value of indirect results of participation in band. What this code does illustrate is that ELA educators and administrators value other extra-musical aspects of music instruction. The ELA educators spoke about their value of interdisciplinary connections with music and their subject to strengthen student engagement and interest. This
theme did not change during the course of the focus group session. Even as the ELA teachers adopted new perceptions, beliefs and values about instrumental instruction, they held fast to their original value of indirect benefits from music instruction.

**Value: Providing opportunity.** The direct link between the central question and the theme *Value: Providing opportunity* is that these educators expressed a deep value for providing urban students the opportunity to play instruments for five or more years. The administrators and music educators felt strongly that it was their obligation to provide this opportunity for ‘at-risk’ students because of their belief system that it will ultimately help students succeed in life.

The case study of this district has the unique feature that thousands of students are provided the opportunity to play completely free of charge through the instrumental loan program. All students receive lessons and ensemble classes free of charge as well, thus, creating an opportunity based program. Administrators proudly spoke of their staunch advocacy efforts to rebuild and maintain funding for the instrumental program. ELA teachers expressed that they appreciated the past administrators of their buildings who supported the instrumental program during difficult budgetary times. Music educators commented that they wanted give students the opportunity to play even if that meant large class sizes. Without these structures of support and intrinsic motivation to continue to provide this opportunity to ‘at-risk’ students it is the belief of participants that the results of the Phase One data and thus, the response to the central question, would be very different. The theme of providing opportunity was pervasive and ardently articulated in every focus group. After hearing about the difference between playing an instrument and achievement in ELA all three groups intensified their desire to provide opportunity for ‘at-risk’ students. Their specific suggestions for next steps are discussed in the next section.
Planning for next steps. The ninth and final major theme titled Planning for next steps, does not directly relate to the central question because many of the statements in this category occurred after the Phase One data was discussed. It does provide great insight into the first sub-category. The planning on the part of all subgroups comes directly from their intensified value of instrumental instruction. All three groups said that they would like to see disaggregated data for ‘at-risk’ sub-groups. The ELA teachers and administrators voiced that they would try to obtain this data for current assessments. The administrators expressed that they would continue to advocate for instrumental music instruction among other next steps including speaking to colleagues about the arts as part of a turnaround strategy. Music educators also stated that they would continue to pursue more opportunities for urban students who want to play a musical instrument. They spoke about offering more non-traditional music ensembles as well as increasing the effort to increase orchestral string instruction. The ELA teachers spoke most frequently about the next steps that they wanted to pursue. This included advocating for another music teacher at their school, encouraging their students to continue or begin playing instruments and working more closely with the music teachers on planning and interdisciplinary lessons.

Discussion on the second sub-question. The second sub-question was directly linked to the central question and first sub-question. It also connects the questions to the problem of practice. The second sub-question reads: To what end do these perceptions affect value-based decisions on the part of administrators and educators about students’ access and equity concerning instrumental music instruction in public schools?

Through this study it is clear that educators draw on their perceptions and beliefs to make value-based decisions. These decisions concern allocation of resources such as funding, time, personnel, as well as individual actions such as advocacy, support and professional passion for
instrumental instruction. Educators spoke from a mission driven perception that in an urban district it was the obligation of the schools and of the educators as an extension of the schools, to provide opportunity and access for all students. Receiving statistical information about the connection between playing an instrument and higher achievement on ELA served as a catalyst to intensify support for increased opportunity in instrumental music. This also speaks to the problem of practice that accountability measures for schools are based on students’ achievement on high-stakes testing. Therefore, it was viewed that if playing a musical instrument increases the likelihood that urban students will score higher on these tests, instrumental instruction in this district is no longer de-valued as a ‘nice extra’ but rather as a proactive intervention for student success.

**Credibility, Trustworthiness, Reliability and Validity**

The overarching methodology of this research is a case study, which is derived from the qualitative research tradition. Because of this, credibility and trustworthiness are important considerations. Due to the fact that this study also employs quantitative methods through the statistical analysis in Phase One, reliability and validity safeguards are also discussed. Creswell (2009) notes that the intention of all quality research is to produce valid and reliable analysis. Lincoln and Guba (2000) state that there are “parallel criteria” whereas quantitative and qualitative research methods are designed to achieve similar ends. Both will be discussed in reference to the appropriate phases of data collection and analysis.

Quantitative studies factor a degree of validity and reliability through the design at the outset. Although Phase One was not an experimental design with random or matched sampling, through analysis of all complete scores of eighth graders who experienced two different treatments, the researcher created the best possible scenario. Data analysis was conducted for
scores collected in a year where all three middle schools administered the same test, had similar course offerings, scheduling, demographics and other attributes that might affect validity.

Qualitative methodology ensures that quality is upheld through multiple measures of trustworthiness (Creswell J. W., 2009; Merriam, 1988; Yin, 2014). Through collecting and analyzing multiple sources of evidence as part of this case study, greater validity is achieved (Tellis, 1997). Triangulation illustrates the convergence of lines of inquiry for the purpose of strengthening validity of the study (Creswell J. W., 2009). In this study triangulation was achieved through the use of multiple data sources such as student test scores, district demographic information, background questionnaires, and focus group responses from three different stakeholder viewpoints.

Additional trustworthiness methods that the researcher applied are: member checking, presenting thick, rich descriptions and clarifying researcher bias. Member checking is a quality control tool that assists with ensuring accuracy (Merriam, 1988). During this study member checking was utilized during focus groups through clarifying questions. Also, all focus group participants were provided an opportunity to read through the transcript of their session and respond with any clarifications or corrections.

As a writing tool, “thick, rich description” was used to provide layers of detail in an effort to provide multiple perspectives (Creswell J. W., 2009). In this study, this was employed through discussion of Phase Two findings. Lastly, the clarification of research bias is key in providing transparency on the part of the researcher. While the quantitative aspect of this study leaves no room for subjectivity, regarding Phase Two, Creswell (2009) posits that this “self-reflection creates an open and honest narrative…” (p. 192). During the focus groups the researcher was careful to project a non-biased viewpoint through prepared questions and little
commentary even when prompted by the group. In the multi-step coding process the researcher kept her bias in mind to avoid conclusions that were not solely derived from the transcripts.

**Implications for Future Study**

The findings and results of this study are supported in current literature. The recent wave of neuroscience literature on playing a musical instrument and literacy development corroborate the Phase One results. There are implications for future study based on the findings that point to a deeper or longitudinal perspective on the data. Looking specifically at the sub-categories for ‘at-risk’ populations, namely, low-income/low-SES, minority, ELL and special education, will provide insight into playing a musical instrument and the literacy development of these groups of students. Another avenue to studying this difference could be through longitudinal studies that track student achievement in literacy over the course of many years. This data is currently available regarding the scores of standardized tests in ELA but a challenge to this is that there is currently no indication of instrumental versus non-instrumental students in the statewide data management system. Therefore this task will be the responsibility of the individual districts.

Another implication for future study is that additional measures of literacy could be collected and analyzed. Many school districts use regular benchmark tests that have a beginning of the year, middle of the year and end of the year administration that could provide interesting data on student growth. The new PARCC test is administered in many states across the nation and would allow for a comparison that crosses state lines. Unfortunately, Massachusetts will be moving to a new test called MCAS 2.0 in the next two years so this comparison will not be as universal at that time.

Moving away from data on student achievement and focusing more on what was suggested in the focus groups, the participants spoke about students gaining confidence and
building skills for success. These responses pointed to a belief that students who are involved in band exhibit positive self-esteem and thus have the confidence to take on safe risks or challenges. As schools continue to think about social and emotional learning and how that effects the overall development of students, a future area of study could be looking at building of self-efficacy (Bandura, 1994) through instrumental instruction. Bandura (1994) states that self-efficacy concerns the belief that an individual is capable; it is developed partly through mastery experiences and peer models. This process describes the basic tenants of instrumental instruction especially in regard to instrumental ensembles. For the ‘at-risk’ population research on self-efficacy and instrumental instruction could yield information to further the field because Bandura (1994) suggests that self-efficacy assists in resilience during adversity and coping with stress.

A last area for greater reflection centers around the documented change in values and belief on the part of the ELA educators when presented with statistical data on instrumental instruction and achievement in ELA. It would be interesting to investigate if this change in belief and value would occur if the data were not from the educators’ district.

**Implications and Recommendations for Practice**

This study yielded implications for both the studied district and the field as a whole. Through the analysis of student assessment data a positive difference was found between playing an instrument for five consecutive years and higher achievement on standardized measures of ELA. This type of data is readily available to all districts in Massachusetts if they are interested in conducting a similar analysis. It would take extra effort to designate students who are instrumentalists vs. non-instrumentalists. Therefore, it is recommended that this metric be added to state required reporting. Furthermore, as recommended by focus group participants, a closer
look at disaggregated data based on sub-groups is recommended for educators to gauge the impact of instrumental instruction on student achievement.

Through the focus group process educators expressed a belief that students who studied an instrument had higher academic success. They felt that the statistical data affirmed this belief. More importantly, in addition to recent advances in neuroscience research, they also suggested other possibilities why this difference exists. Therefore, it is recommended that schools and researchers take a closer look at aspects of ‘band culture’ that builds skills for success. This investigation may yield implications for student growth in social-emotional learning (SEL) and resiliency for urban students.

One aspect of the focus groups that the researcher found surprising was the strong desire for educators to make plans for next steps and take action. In each session there was a sense that the statistical information was an important tool that could allow them to advocate more effectively for equity and access to the instrumental program for ‘at-risk’ students. Overall the focus group with the ELA teachers proved interesting due to the fact that they articulated different beliefs at the start of the session than at the end. The results of the data analysis as well as the statements of their colleagues influenced them. Implications from this surround the power of small group discussion. Thus, a recommendation for schools that want to promote a culture that values instrumental instruction is, to use similarly structured small group discussions to highlight current research and discuss the value of instrumental instruction. From these small groups may arise practical and exciting next steps. Additionally, some of the educators also spoke from their perspective as parents who have decided to encourage their children to persevere in playing a musical instrument based on their belief that it promotes achievement. Therefore, a similarly structured small group informational setting for parents and guardians may
promote increased support for instrumental students at home.

Lastly, even in an urban district that provides free instruments to thousands of students, investment in equipment and personnel to provide opportunity to ‘at-risk’ students needs to increase. Through candid focus group discussions the implications of the research has already generated suggestions for this increase. Participants voiced this recommendation in all three groups due to their belief that participation in instrumental music programs will lead to success for urban students. It is recommended that urban schools across the nation increase resources for instrumental music programs as an intervention aimed at narrowing the pervasive achievement gap between students that are ‘at-risk’ and those that are not.

Conclusion

During the past decade as schools across the country saw a decline in instrumental music programs, due to value based decisions favoring investment in traditionally tested subjects, the studied district offered increased opportunity for urban students to learn how to play an instrument. With this as the backdrop for the case study, the purpose of this study was to understand how playing a musical instrument for five consecutive years relates to measures of literacy achievement for urban middle school students. Of further interest to the researcher were the perceptions and beliefs of educators about this relationship and how those affect value-based decisions concerning instrumental music instruction in urban public schools.

The findings from Phase One data analysis of the 2014 English Language Arts Massachusetts Comprehensive Assessment System exam for 782 eighth grade students, indicate that instrumental students outscore their peers on high-stakes measures of literacy. In seven out of eight independent t-tests a statistically significant difference was found between students who played a musical instrument for five consecutive years and those who did not. These findings
should be interpreted with caution due to unbalanced group sizes and is not intended to constitute a case for causation.

During Phase Two, three separate focus groups were conducted with educators grouped by position in the district: (1) administrators, (2) music educators, and (3) ELA teachers. The findings from these focus groups yielded nine major themes that relate to the central question and sub-questions. Taken together findings indicate that educators have a belief system that is built on first-hand experiences and research. During the focus group discussions there was also evidence of educators considering the perceptions, beliefs and values of their peers in relation to statistical data. Educators across all three focus groups expressed a belief that students who study a musical instrument have higher achievement on measures of literacy. In the studied urban public school district, this belief paired with the parallel belief that band builds skills for success, guides educators to advocate for decisions that allocate resources to increase opportunity for instrumental instruction.
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http://www.apa.org/topics/socioeconomic-status/


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Appendices

Appendix A: IRB Application

For NU IRB use:

Date Received: 8/27/15 reviewed 9/29/15  
NU IRB No. CPS15-04-17  

Review Category: ___________________ Approval Date ______________

APPLICATION FOR APPROVAL FOR USE OF HUMAN PARTICIPANTS IN RESEARCH

Before completing this application, please read the Application Instructions and Policies and Procedures for Human Research Protections to understand the responsibilities for which you are accountable as an investigator in conducting research with human participants. The document, Application Instructions, provides additional assistance in preparing this submission. Incomplete applications will be returned to the investigator. You may complete this application online and save it as a Word document.

If this research is related to a grant, contract proposal or dissertation, a copy of the full grant/contract proposal/dissertation must accompany this application.

Please carefully edit and proof read before submitting the application. Applications that are not filled out completely and/or have any missing or incorrect information will be returned to the Principal Investigator.

REQUIRED TRAINING FOR RESEARCH INVOLVING HUMAN SUBJECTS

Under the direction of the Office of the Vice Provost for Research, Northeastern University is now requiring completion of the NIH Office of Extramural Research training for all human subject research, regardless of whether or not investigators have received funding to support their project.

The online course titled "Protecting Human Research Participants" can be accessed at the following url: http://nhpr.nihtraining.com/users/login.php. This requirement will be effective as of November 15, 2008 for all new protocols.

Principal Investigators, student researchers and key personnel (participants who contribute substantively to the scientific development or execution of a project) must include a copy of their certificate of completion for this web-based tutorial with the protocol submission.

Certificate(s) Attached
Certificate(s) submitted previously – on file with the NU’s Office of Human Subject Research Protection
Appendix B: Study Permission Letter

Dear Superintendent,

As you are aware, in addition to serving as the Director of Fine Arts for the district, I am also a candidate for a doctoral degree at Northeastern University. In this capacity, I am writing to seek permission to conduct a case study of the instrumental music program at our middle schools. Pseudonyms will be used at all levels of the study so that the identity of the district, schools and individuals will remain confidential at all times.

The design of this study is both quantitative and qualitative with two distinct phases. The data collection and analysis in Phase One is designed to study the ELA standardized test scores of the eighth grade cohort from SY 2013-2014. In this regard, I have discussed access and data collection with key gate-keepers (e.g. Technology Director, Data and Assessment Director) in our district who assure me that there are no barriers to success in collecting this data. Upon analysis of this preliminary data analysis that may illustrate patterns and trends regarding ELA scores and participation in instrumental classes, a series of focus groups will convene. The focus groups will consist of middle school music teachers, middle school ELA teachers, and administrators. This phase is designed to elicit participant perceptions about the preliminary statistical data to gauge value-based decision making on the topic.

The purpose of my study is to understand how playing a musical instrument for five consecutive years relates to measures of literacy achievement for urban middle school students. Furthermore, I want to better understand if the perceptions of educators and administrators about this topic affect value-based decisions regarding resource allocation. Through a case study I will be able to triangulate data and deeply explore the conditions that surround this topic.

It is my hope that this study will provide insight into the phenomenon that is supported in the research literature and through anecdotal accounts. This investigation will give us a detailed account of both the statistics and educator perceptions.

If you have any questions regarding this study, please call me at 508-99704511 ex 3352 or the chairperson of my committee, Dr. Carol Young, at Northeastern University, 508-587-2834. Thank you for your time and consideration.

Sincerely,

Kerri Anne Quinlan-Zhou, Director of Fine Arts

Doctoral Candidate, College of Professional Studies Northeastern University
Appendix C: Call for Participants

Dear Educators and Administrators,

I am Kerri Anne Quinlan-Zhou, the Director of Fine Arts for this district and a doctoral student at Northeastern University in Boston, Massachusetts. In fulfillment of my doctoral studies, I will be conducting a research study exploring the relationship between participation in the instrumental music program and measures of literacy for eighth grade students. As an ELA/music teacher or administrator, I invite you to participate in this research study.

Data collection for this study includes semi structured interview responses, demographic information and short questionnaire. There is the possibility of a brief, follow-up interview to clarify findings. Focus groups and interviews will last approximately 45 -60 minutes and may include a follow-up interview of approximately 20 minutes.

Participation in this study is voluntary, and participants have the right to cease participating at any point during the study without penalty. Focus groups will take place at your convenience and at a comfortable, private location in one of our schools. Pseudonyms will be used for each participant throughout this study and all personal information will be kept strictly confidential. Further, participation in this study will in no way affect participants’ performance evaluations. All data collected will be stored in a locked cabinet and on an encrypted hard drive and will be destroyed after five years.

Your participation in this study will be greatly appreciated. If you have any questions, please contact me. Thank you very much.

Sincerely,

Kerri Anne Quinlan-Zhou
Appendix D: Informed Consent Form

Informed Consent Form Northeastern University, College of Professional Studies

Investigator Name: Kerri Anne Quinlan-Zhou

Title of Project: Understanding the Effects of Sequential Instrumental Music Instruction on Achievement in Literacy for Eighth Grade Students: A Qualitative, Case Study of One Urban School District

Informed Consent to Participate in a Research Study: You are invited to take part in a research study. This form will provide information about the study and your role in it. You may ask the researcher any questions that you have. When you are ready to make a decision as to your participation, please inform the researcher. You are not obligated to participate. If you decide to participate, the researcher will ask you to sign this statement and will give you a copy to keep.

Why am I being asked to take part in this research study?

You have been asked to participate in this study because you are – a middle school music teacher, a middle school ELA teacher, a middle school administrator or a central office administrator.

Why is this research study being done?

The purpose of this research is to understand how playing a musical instrument for five consecutive years relates to measures of literacy achievement for urban middle school students. Furthermore, do the perceptions of educators and administrators about this topic affect value-based decisions regarding resource allocation.

What will I be asked to do?

If you choose to participate in this study, the researcher will ask for your participation in an audio-taped interview or focus group that centers on your perceptions about preliminary data concerning literacy and instrumental music participation in our school district. After focus group data has been gathered, each participant will be offered the opportunity to review the data from sessions to check for accuracy and/or edit their responses. As with all other parts of this study, this is voluntary.

Where will this take place and how much time will it take?
Interviews will take place at one of the schools during a convenient time and place for the participant and in a private office or classroom. Each interview will not exceed one-hour.

*Will there be any risk or discomfort to me?*

There are no foreseeable risks involved in taking part in this study. All responses will be kept confidential and the research will be destroyed after the project is completed.

*Will I benefit by being in this research?*

There will be no direct benefit to you for taking part in the study. However, the information learned from this study may help schools and further the field of research on the topic.

*Who will see the information about me?*

Your role in this study will be confidential. Only the student researcher will see the information about you. No reports or publications will use information that can identify you in any way. All audiotapes, observation forms, and documents will be secured throughout the duration of the study. This information will be stored for five years and then destroyed.

*What if I do not want to take part in the study?*

You are not required to participate in this study. Stopping your participation will not affect your professional standing. At any time during the study, you may refuse to answer questions or end your participation. If you choose not to participate, ignore this form.

*Who can I contact if I have questions or concerns?*

Kerri Anne Quinlan-Zhou Work # (508) 685-5196

Email kquinlan-zhou@drregional.org

Carol Young, Ed.D. Principal Investigator –Overseeing Study Northeastern University, Boston Campus # 508-587-2834 Email: c.young@neu.edu

If you have any questions about your rights as a participant, you may contact Nan C. Regina, Director, Human Subject Research Protection, 960 Renaissance Park, Northeastern University Boston, MA 02115 tel. 617-373-4588, email: n.regina@neu.edu

You may call anonymously if you wish.

*Will I be paid for my participation?*

There is no compensation for participation in this study.
Will it cost me anything to participate?

There is no cost to participate in this study.

I have read, understood and had the opportunity to ask questions regarding this consent form. I fully understand the nature of my involvement in this research study as a participant and the potential risks involved. Should I be selected, I agree to participate in this study on a voluntary basis.

___________________________________ Research Participant

(Printed Name)

___________________________________ Research Participant

(Signature) Date
Appendix E: Interview Questions

My proposed research interest: to understand how playing a musical instrument for five consecutive years relates to measures of literacy achievement for urban middle school students.

**Study Main question:**

How does playing an instrument for five or more consecutive years affect the literacy achievement of middle school students in an urban public school?

**Study Sub-questions:**

How does this relationship strengthen, weaken or remain the same based on a) socio-economic status, b) designation as an English Language Learner (ELL) or c) minority background?

How do educators’ (i.e. music teachers, ELA teachers and administrators) perceptions of the value of music education change (or remain the same), when presented with quantitative data on playing an instrument and students’ literacy achievement?

To what end do these perceptions affect value-based decisions on the part of administrators and educators about students’ access and equity concerning instrumental music instruction in public schools?

**Background questions (to be answered prior to the focus group or interview)**

1. How long have you been a teacher/administrator in this district? Did you serve in this capacity prior to being employed in this district – if so, for how many years?

2. Tell me about yourself as an educator. Background?

3. Have you ever participated in an instrumental music program? If so, please describe your
experience.

4. Has anyone in your family or immediate circle of friends ever participated in an instrumental music program? If so, please describe your perception of their experience.

5. As a child, would you identify with any of the “at-risk” demographic groups that are being explored in this study (low-SES, ELL and/or minority)?

6. What is your general perception about achievement in literacy/ELA for eighth grade urban students who participate in instrumental programs for five years?

7. Based on this perception, what is your current position on the value of instrumental music instruction?

Draft Focus Group/Interview Questions (to be administered after Phase One quantitative data is presented to the participants)

**Question 1:** In light of the statistical information that was just presented from our district about the relationship between literacy achievement and participation in instrumental classes – have your perceptions about the topic changed or stayed the same? Please explain.

Do you have thoughts that pertain specifically to “at-risk” demographic groups?

How do you think your colleagues in other disciplines first perceived the topic and what is your assumption of their perception when presented with the data?

Do you think that it is important for real-world data to be presented on this topic? Why?

**Question 2:** Based on your current perception of this relationship, how do you value instrumental music instruction?

Did this new information change your value of instrumental music instruction? If so, how?

How do you think other stakeholders value instrumental music instruction? What makes you think that?

**Question 3:** Based on your value of instrumental music instruction, how should resources be allocated? At the school level? District level? State/federal level?

Is there any other pertinent information that you would like to share?
Appendix F: Background Questionnaire

1. How long have you been a teacher/administrator in this district?

_____________________

a. Did you serve in this capacity prior to being employed in this district  Y / N

   b. – if so, for how many years? ________________

2. Tell me about yourself as an educator. Background?

3. Have you ever participated in an instrumental music program?  Y / N

   If so, please describe your experience.

________________________________________________________________________

4. Has anyone in your family or immediate circle of friends ever participated in an
   instrumental music program?  Y / N

   a. If so, please describe your perception of their experience.

________________________________________________________________________

5. As a child, would you identify with any of the “at-risk” demographic groups that are
   being explored in this study (low-SES, ELL and/or minority)?

________________________________________________________________________
Appendix G: Demographic Shifts

Demographic Shifts Trending Toward Higher Percentages of ‘At-Risk’ Students in the Studied District

For students with disabilities the district is 5.5% higher than state average in school year 2013-2014. This is an increase of 2.2% from twenty years ago. The percentage of minority students illustrates an increase in students identified as non-white rising 25.8% over twenty years; 17.1% in the last ten years; and the gap between state and district average widening from a 5.7% difference in school year 1993-1994 to a 17.3% difference in 2013-2014. Enrollment indicators for ‘low income’ shows similar trends with a 25.8% increase in the district over twenty years; 17.1% increase during the past ten years; and a widening gap between state and district averages resulting in a 37.3% higher low income enrollment for the district in 2013-2014.

Figure G1 Twenty year longitudinal Student Enrolment Data for Students with Disabilities
Figure G2 Twenty year longitudinal Student Enrolment Data for Students - Minorities

Source for all figures: (Massachusetts Department of Elementary and Secondary Education, 2016)
Appendix H: Percent Correct Comparison Between State and District Scores

The “All Items” category shows that all the eighth grade students in the entire district had 60% of the answers correct while the state average for that test was 72% correct this being 12% lower than the state average. When the instrumental and non-instrumental student scores were disaggregated as seen in Tables 4.11 and 4.12 above, the mean score for instrumental students was 73.26 % correct while non-instrumental students had a mean of 58.68% correct. Therefore, in comparing these samples of urban students to all of their eighth grade peers across the state, the mean for the non-instrumental students 13.32% below the state average while the mean for the instrumental students is above the state average by 1.3%.

Table H1 Percent Correct District and State Comparison

<table>
<thead>
<tr>
<th>Subject/Standard/Question type</th>
<th>Possible Points</th>
<th>District % Correct</th>
<th>State % Correct</th>
<th>District/State Diff</th>
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<tbody>
<tr>
<td><strong>English Language Arts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All items</td>
<td>52</td>
<td>60%</td>
<td>72%</td>
<td>-12</td>
</tr>
<tr>
<td><strong>Question Type</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple Choice</td>
<td>36</td>
<td>64%</td>
<td>77%</td>
<td>-13</td>
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<tr>
<td>Open Response</td>
<td>16</td>
<td>50%</td>
<td>62%</td>
<td>-12</td>
</tr>
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<td><strong>Strand / Topic</strong></td>
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<td></td>
</tr>
<tr>
<td>Language Anchor Standard</td>
<td>6</td>
<td>56%</td>
<td>68%</td>
<td>-12</td>
</tr>
<tr>
<td>Vocabulary Acquisition and Use</td>
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<td>64%</td>
<td>74%</td>
<td>-10</td>
</tr>
<tr>
<td>Reading Anchor Standard</td>
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<td>61%</td>
<td>73%</td>
<td>-12</td>
</tr>
<tr>
<td>Craft and Structure</td>
<td>15</td>
<td>60%</td>
<td>73%</td>
<td>-13</td>
</tr>
<tr>
<td>Key Ideas and Details</td>
<td>31</td>
<td>61%</td>
<td>72%</td>
<td>-11</td>
</tr>
</tbody>
</table>

Source: (Massachusetts Department of Elementary and Secondary Education, 2014)
Appendix I: Histograms of Frequency Distributions

Figure I.1 Scaled Score Distribution for Instrumental Group

![Histogram for Instrumental Group](image)

Figure I.2 Scaled Score Distribution for Non-Instrumental Group

![Histogram for Non-Instrumental Group](image)
Figure I 3 Percent Correct Distribution for Instrumental Group

Figure I 4 Percent Correct Distribution for Non-Instrumental Group
Figure I 5 Student Growth Percentile Distribution for Instrumental Group

![Histogram](https://via.placeholder.com/150)

- Mean = 49.09
- Std. Dev. = 28.334
- N = 56

Figure I 6 Student Growth Percentile Distribution for Non-Instrumental Group

![Histogram](https://via.placeholder.com/150)

- Mean = 44.20
- Std. Dev. = 29.31
- N = 648
Figure 1.7 Multiple Choice Distribution for Instrumental Group

![Multiple Choice Distribution for Instrumental Group](image1)

Figure 1.8 Multiple Choice Distribution for Non-Instrumental Group

![Multiple Choice Distribution for Non-Instrumental Group](image2)
Figure I 9 Open Response Distribution for Instrumental Group

![Histogram showing frequency distribution of OpenResp for Instrumental Group with mean = 77.80, Std. Dev. = 15.33, N = 86.]

Figure I 10 Open Response Distribution for Non-Instrumental Group

![Histogram showing frequency distribution of OpenResp for Non-Instrumental Group with mean = 62.80, Std. Dev. = 20.20, N = 506.]
Figure I 11 Vocabulary Distribution for Instrumental Group

Figure I 12 Vocabulary Distribution for Non-Instrumental Group
Figure I 13 Craft and Structure Distribution for Instrumental Group

![Histogram for Instrumental Group]

Mean = 73.51
Std. Dev. = 18.038
N = 85

Figure I 14 Craft and Structure Distribution for Non-Instrumental Group

![Histogram for Non-Instrumental Group]

Mean = 58.50
Std. Dev. = 22.123
N = 895
Figure I 15 Key Ideas Distribution for Instrumental Group

Figure I 16 Key Ideas Distribution for Non-Instrumental Group