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Musical Group Participation and Reading Fluency: Is there a connection?

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Abstract

The purpose of this action research was to determine if there is a connection between reading fluency and sight-reading music in a music performance group. Students were given a sight-reading test during their first and second years in band. They also took the Minnesota Comprehension Assessment test in reading during their 5th and 6th grade years. Data collection was obtained using the test scores from students who participated in a musical group (band, choir, orchestra) and students who did not participate in a musical group. Findings indicated that students who participate in a musical group (band, choir, orchestra) have a greater increase in reading test scores than those who do not participate in a musical group.

Musical Group Participation and Reading Fluency: Is there a Connection?

Instruction in music can be a particularly rich source of support for achieving reading literacy. Most basic skills used in text reading or decoding, find parallels in music reading. (Hansen & Bernstorf, 2002). When children are taught to read a book or newspaper, they are taught to read left to right, well, music is also read left to right. There are symbols in books, newspapers, music and other media that represent how a person is supposed to play something or read something. Music and reading have so many of the same symbols it just takes a moment to notice. Hansen, Stuber, and Bernstorf, (2014) states some of the visual elements that are part of both literacy and music are knowledge of letters, words, and sentences, visual focus, and visual memory.

Slater et al. (2014) state, extent of participation in school music programs relates with better performance in many academic areas, including math, reading and higher test scores. Many of the skills involved in literacy can also be found in music. Cunningham and Allington (2011) state that when we see or hear words in a new context, our brain creates new synapses (connections) to those words, making it so crucial that children are exposed to vocabulary and other literacy skills in different and meaningful ways. For students, having the chance to be a part of a successful music program can help them to understand literacy better.

Fluency is defined as the ability to read with speed, accuracy and proper expression (Rasinski, 2006). Reading music has to be done in the same manner as literacy. Finding a connection between the two so others can relate it to each other is the goal. Instruction in music can be a particularly rich source of support for achieving reading literacy (Hansen & Bernstorf, 2002). Most instrumentalist and vocalists read music symbols. Strong decoding skills have been found to be essential for reading text with comprehension (Hansen & Bernstorf, 2002).

Connections that reading fluency and sight-reading music have, makes them correlate with each other and feed off each other. Rashidi and Faham (2011) state that music has been found to contribute to the acquisition of linguistic skills in the areas of reading, writing, listening and speaking. When a student takes part in a musical group, they learn they need to read faster and quicker than those students who are not in a musical group. Instruction in music can be a particularly rich source of support for achieving reading literacy. Most basic skills used in text reading or decoding find parallels in music reading (Hansen & Bernstorff, 2002). The parallels between reading fluency and sight-reading music that can help students achieve greater success on statewide tests, need to be looked at researched to help students succeed.

This study will explore the connection between sight-reading music and reading fluency using data from state tests and sight-reading tests done in the music classroom. It is hypothesized that there will be a difference in reading test scores for those students who are in a musical group compared to those students who are not in a musical group. The research question posed and analyzed in this study is: Is there a connection between reading fluency and sight-reading music in a musical group?

Review of the Literature

The following literature review summarizes key points in connecting reading fluency to sight-reading instrumental music. Johnson and Memmott (2006) state that students in high-quality school music programs score higher on standardized tests compared to students in schools with deficient music education programs. The review looks at a variety of studies done on different parts of reading fluency and how different aspects of music can affect it. This includes playing music while testing taking and taking part in a music group, outside of the general music classroom.

Penttinen and Huovinen (2011) defines sight-reading music as, the unrehearsed performance of notated music. Unrehearsed music is used during first practices of musical group rehearsals. Anyone can practice sight-reading just like they can practice reading. If students take time to read through a piece of music every day, they will notice how they can mentally process information a lot faster and easier.

Reading fluency is defined as reading that demonstrates accurate and effortless decoding, appropriate use of volume, pitch, juncture, and stress, age- or grade-level-appropriate reading rates and appropriate use of text phrasing or “chunking”, leading to comprehension of what one reads (Reutzel, 2009). The development of fluency is apparent in each of the skills needed for decoding. Truly fluent readers will demonstrate high-level skills in phonological awareness, phonemic awareness, sight identification, orthographic awareness, and the ability to use effective cueing systems (Hansen & Bernstorf, 2002). Fluency does not only take place in reading, but it can take place in many other areas as well. Teachers can use effective methods for helping students to become fluent readers (Reutzel, 2009). One way to help them would to expose students to rich and varied models of fluent oral reading. Another way is to provide students with

explicit instruction focused on various aspects of fluent reading, including how to self-regulate and improve their own fluency (Reutzel, 2009).

Assessments

Common Core State Standards call for testing students not only in math and reading but also in subjects like foreign language, economics, the arts, and physical education. The Common Core State Standards both for mathematics and for English language arts and literacy are explicit in their focus on what students are to learn (Porter, McMaken, Hwang, & Yang, 2011). State- and nation-wide testing in most Minnesota schools happens twice a year. One set of tests, the FastBridge test is done in the fall and the MCA (Minnesota Comprehensive Assessment) tests are done in the spring of the year. Students are tested in reading, mathematics as well as science.

Assessments are done in both reading and fluency, but oftentimes, the value of assessment, which is to determine what children know in order to scaffold their learning, is overlooked (Abadino & Turner, 2005). Assessments have become a crucial part in classrooms across the nation including the music classrooms. Watkins and Farnum (1962) have designed a book, the Watkins-Farnum Performance Scale, to help with assessments in band. This is a standardized achievement test for all band instruments for year to year progress records as well as sight-reading tests.

The Minnesota Comprehensive Assessment tests are given to students in the Fairmont School District once a year, based on their grade level and subject area. Music can play an important role in raising test scores and finding out what the correlation between the two is a very interesting topic. Slater et al. (2014) states, music training has been associated with enhanced language and learning skills, suggesting that music programs could play a role in helping children stay on task academically. There is evidence that rhythm and reading abilities

call upon common neural resources and that both depend upon the temporal precision and consistency of neural responses to sound (Slater et al., 2014) Finding connections between sight-reading instrumental music and reading fluency can help determine if students who participate in music have higher test scores in reading than those that don't.

Skills in both reading and music

As music educators, teachers know that during the process of learning to read music, students practice similar skills in reading class. Hansen and Bernstorf (2002) state in the reading classroom, children with emerging skills can name familiar signs and symbols whereas in the music classroom children who perform symbol reading at the emerging stage can respond to symbols paired with or representing musical elements or sounds. As a result of the Common Core State Standards, music students are experiencing new activities in their ensembles and music classes that focus on expressing ideas through listening, speaking, reading and writing (Cangro, 2014). Music educators and reading teachers should connect and compare the parallels with each subject. Language and music both depend on phonatory and articulatory mechanisms that are rudimentary in other primates, and both depend, for their appreciation, on distinctly human brain mechanisms dedicated to the analysis of complex, segmented, rapidly changing streams of sound (Sacks, 2008). Music educators can reflect on reading and language development in their classrooms and teachers can create a sizeable library of tools for their classroom that can be used to enrich the learning of their children.

Children who do better academically, are more likely to choose and persist with music training (Costa-Giomi, 2012). In most schools, music programs are one of the first programs to leave schools because of budget cuts. If music programs are discontinued, students will be deprived of kinesthetic, aural, oral, visual, and emotional experiences that can ultimately bring written texts to life (Hansen & Bernstorf, 2002). Learning in music can open doors to different

influences and can have life-changing experiences that can contribute to students' skills in reading.

Music encompasses all aspects of children's learning. There have been several studies conducted that suggest music can assist students in all areas of literacy, but more specifically with reading comprehension (Anderson & Fuller, 2010). The ending goal for subjects, such as reading, math and science is to pass the assessments at the end of the year. Music is also one of those subjects where students are tested during the year. Helping students learn those different subject areas and their relationship to music could be beneficial to students. Reading fluency and comprehension are related but what is the relationship it has with sight-reading in instrumental music. Hansen et al. (2014) state, through music, children learn to: understand language, experiment with rhythm, words, tempo and melody, think creatively, make a connection between print and spoken words, and listen. Using these things can help children read better and comprehend what they are reading.

Literacy is defined as the process of using reading, writing, and oral language to extract, construct, integrate and critique meaning through interaction and involvement with multimodal texts in the context of socially situated practices (Frankel, Becker, Rowe, & Pearson, 2016). There are many things in music that translate into parts of literacy. Musical training involves complex motor, auditory and cognitive skills, often requiring memorizing long, complex bimanual finger sequences, and translating musical symbols into motor sequences during sight-reading (Johansson, 2008). In reading and writing, knowing letters, words and sentences, help them learn. In music, the notes are the words. Learning to read notes and putting them together to make phrases will help students form words into sentences in reading. Hansen & Bernstorf (2002), state the different comparative skills used in text reading, music-symbol reading, and

music-text reading are: phonological awareness, phonemic awareness, sight identification, orthographic awareness,

Lowe (2002) states, educators have found that through interdisciplinary curricular and educational strategies, students seem to develop abilities to analyze, organize and interpret information received across all the various disciplines. A teacher may incorporate songs during big book instruction. Students can sing a repeated text every time it comes into the story. Unfortunately, many general education classroom teachers struggle with rhythm and how to put a steady beat together. That can make it difficult for students to learn (Lowe, 2002).

Studies done on music and reading fluency

Anderson and Fuller (2010), did a quantitative study of the effect of lyrical music on reading comprehension. All students in this study were general education students who were proficient in speaking, reading and writing English. Students were assessed with the reading comprehension subtest of the Gates-MacGinitie Reading tests (Anderson & Fuller, 2010). They tested two groups of students, one group listened to music while taking a test and the other did not. It showed that students who listened to the music while taking the test did significantly lower than the other group. The potential that music training could enhance reading skills is especially pertinent now that there are ongoing debates in educational systems about the most effective strategies for impacting academic achievement in core curricular (Gordan, Fehd, & McCandliss, 2015).

In Riddle's (2016) research, Riddle states, there is a real power in music, which I think is often left largely unrealized in the busy work of classrooms. Riddle sees that music is a part of every human and that there is a potential to use it for the benefit in literacy learning. As well as being a useful memory trigger, music can also have a calming effect and is used in many different ways (Riddle, 2016). Riddle continues to talk about strategies for using music in

literacy learning and different ideas that can be used within a classroom. There is a definite link between music and literacy.

Jancke's (2012) research on the relationship between music and language, he researched twenty articles, twelve of which were research papers on new findings of a close relationship between music and language functions. Musical training may aid in the prevention, rehabilitation, and remediation of a wide range of language, listening and learning impairments. This can attribute to show that music may play an important role in students' reading fluency.

Reading fluency around the world

When looking at the reading fluency of America's children, the National Assessment of Education Progress (NAEP) (2017) found that less than half of 8th graders and less than half of 4th graders were achieving proficient reading standards. Both scores were not significantly different from the last test in 2015. Although the scores are higher than 20 years ago, scores have not increased in great amounts the past 10 years. Educators and researchers claim that the development of reading fluency is critical in learning to read and that reading fluency plays a vital role in developing effective and efficient readers (Abadiano & Turner, 2005).

According to Register, Darrow, Standley, and Swedberg (2007), less than half of children have difficulty reading and approximately less than a quarter of school-age children have been categorized as having a specific learning disability. In recent years there has been an increase in literature that supports certain music experiences are being used to teach certain elements of literature. There have been several studies conducted that suggest music can assist students in all areas of literacy, but more specifically with reading fluency (Anderson & Fuller, 2010). Every culture has songs and rhymes to help children learn the alphabet, numbers and other lists. Even adults use mnemonic devices or patterns – and the most powerful of these devices are rhyme, meter and song (Sacks, 2008).

Blacking (1995), states, music and reading fluency connections not only happen within the classroom in the United States but is something that is happening all over the world. Not every place has the opportunity for children to take part in extra music training, such as band, choir or orchestra, and depend on general classroom music for all their training. Children in South Africa – as generally in all African cultural contexts – participate in rich heritage of musical traditions from an early age (Blacking, 1995). This happens in their community and could have beneficial effects on their learning but are not acknowledged and utilized within in their schooling. The question of how conceptual skills in one subject discipline could transfer to benefit the learning and development of related conceptual skills in different but related disciplines has long been part of debates in psychology and education, not least in research on South Africa's schooling (Muthivhi & Kriger, 2019).

Music and disabilities

Even students with disabilities or disorders who receive extra music training have tendencies to better in classrooms (Flaunacco et al., 2015). Rhythm skills have been thought to be relevant to reading to typically developing children and students with a learning disability (Gordon et al., 2015). Less than a quarter of the school-age population that fails to get into initial learning that is, to acquire reading, writing, and/or calculation correctly, despite normal intelligence and in the absence of gross psycho-affective or socio-educative deficiency (Habib, Lardy, Desiles, & Besson, 2016). One such disability is dyslexia.

Dyslexia is a neurodevelopmental reading disability that adversely affects the speed and accuracy of word recognition, and as a consequence, impedes reading fluency and text comprehension (Benfatto et al., 2016). Children with dyslexia show deficits in temporal processing, both in language and in music, therefore poor performance in tasks requiring temporal processing seems to be a crucial factor in dyslexia in children (Flaunacco et al., 2015).

Therapist and teachers might say if there are common process between music perception and speech perception that if you improve perception in music, you can improve a child's speech and reading skills as well. Work by Overy (2003) revealed that a small group of children with reading disability improved their phonological awareness and spelling skill faster during an 8-week period of music instruction that during the same amount of time with no music training (Gordan et al., 2015).

Musically trained children are i) better at detecting pitch and envelope changes in speech, ii) show higher vocabulary and reading abilities, iii) are more efficient in segmenting a new language (Flaugnacco et al., 2015). When a music group is making music, it exercises both sides of the brain. The left part of your brain is more mathematical while the right side is the creative part. The musician's brain is ideally suited to study brain changes induced by intensive training and the effects of a targeted and repeated cognitive activity on brain morphology, as suggested for the rehabilitation of dyslexia (Gordan et al., 2015). It is strongly suggested to use music training in dyslexia rehabilitation, and specifically recommended to focus on rhythm rather than on pitch accuracy as is often the case in classical music pedagogy (Habib et al., 2016).

The OPERA hypothesis proposes that such benefits of neural encoding of speech, from musical training, are driven by adaptive plasticity in speech-processing networks and that this plasticity occurs when five conditions are met (Patel, 2011). The O in OPERA is overlap which stands for an anatomical overlap in the brain networks that process acoustic features used in both music and speech. The P in OPERA stands for precision, which means music places higher demands on these shared networks than does speech. The E in OPERA is emotion which is the musical activities that engage this network elicit strong positive emotion. The R in OPERA is repetition which is the musical activities that engage this network are frequently repeated. The A

in OPERA is attention which is the musical activities that engage this network are associated with focused attention (Patel, 2011). This provides a framework for highlighting the multiple perceptual demands musical training requires and the benefits such demands may bestow on neural systems that are important for literacy and language skills (Gordan et al., 2015). Musical rhythm and been linked to reading skills. Students who can tap more consistently can read measures better.

Parallels between music and reading fluency

Instruction in music can be a great support for achieving reading fluency. Hansen et al. (2002) state there are so many parallels between music reading and basic skills used in text reading and decoding. Most musicians can read symbols, which correlate to words in reading. When students are at the music-text reading level they are choosing movements and pictures to represent what they are hearing (Hansen et al., 2002). When they get to the decoding level, students are sight-reading text and music at the same time. They are paying closer attention to pitch and rhythms. Truly fluent readers will demonstrate high-level skills in phonological awareness, phonemic awareness, sight identification and the ability to use effective cueing systems (Hansen & Bernstorf, 2002).

Slater et al. (2014) says that music and language skills rely on auditory processing. This means, that students take in sound through the ear, which then travels to the brain where the language area can interpret it. For this process to take place for reading, a child must make sense of the incoming sound or words first. It has been theorized that music training promotes plasticity in speech-processing networks when certain criteria are met including precise manipulation of sound as well as emotional engagement attention and repetitive practice (Slater et al., 2014).

To be able to read music or read words, students must pay close attention to details in what they are reading (Groff, 1976). Therefore, because of this there have been claims that experiences children have in music may help them to be able to read better. Groff (1976) says, music activities can create certain attitudes, moods or self-concepts in the child which will help them learn to read. With singing music or playing music, children must listen carefully to what they are doing to know if they are singing or playing correctly. Just like in reading, students must listen to the inflection in their voice to know if they are pronouncing the words correctly. Most problems in children's reading comprehension are caused from reading with the wrong inflection (Groff, 1976). Following along in music is closely related to following along in reading. Students find out who has the melody, when they are supposed to play dynamics as well as when the music ends. In reading, students follow along to know the story sequence. They will find out who is telling the story, when the apex of the story is and when the story will end.

Music during testing

Gray and Della Sala (2007) state, even when children listen to music before or during reading tests, it can affect the performance of the child. The "Mozart effect" is the effect that refers to enhanced performance on spatial-temporal measures after listening to music composed by Mozart compared to control conditional that involve sitting in silence or listening to relaxation instructions (Rauscher et al., 1993). Other composer effects, such as Liszt, Brahms and Stravinsky, have also been reported but the Mozart effect is the most well-known. Tests done for the Mozart effect, were done when students would listen to 10 min of Mozart's music and then immediately took a written test. Schellenberg et al. (2007) found that the Mozart effect is simply one example of the many ways that emotional state influences cognitive processing. This, however, is only one finding. This is a subject that could be researched more

fully to completely understand what it is that happens to your brain when music is being played in the classroom during testing.

Students learn differently and implementing music to the classroom for testing can be a way for students to improve their reading skills. Anderson and Fuller (2010) conclude that studies have found that the use of classical music or music in general has helped improve students' reading comprehension skills. Stalinski and Schellenberg (2012) research says that positive moods are associated with enhanced recall of a narrative, where negative moods are associated with reduced word recall. Music can bring a positive atmosphere to a classroom and can relax students when taking tests. When the music playing in the background is familiar to students, they are not concentrating on figuring out the song which is playing, but rather linking the information that they are reading to the music playing (Purnell-Webb & Speelman, 2008).

Connecting a music classroom and reading classroom

In Hansen et al. (2014) book, it talks about what literacy is, how music teachers can teach literacy and reading teachers can teach music, how literacy can be taught and the lifelong benefits of musical training. Students who are in music (band, choir and orchestra) have an advantage over students who are not because of the components that they are doing in music. Hansen and Bernstorf (2002) state, sight identification relates to instant recognition of words, notes, etc., by glancing at them. Students in the reading classroom with emerging skills can name some high-frequency letters, numbers, or words whereas in the music classroom, children with emerging skills who are learning music-symbol reading use standard music vocabulary to describe music qualities that they hear.

Orthographic awareness relates to the ability to understand the use of letters and other symbols in a writing system. For the reading classroom, the ability to use letters or approximations of letters to represent written language signifies emerging skills whereas in a

music classroom, it challenges children with emerging skills to recognize that music symbols represent musical sounds (Hansen & Bernstorf, 2002). Orthographic awareness also combines the elements of alphabetic knowledge and music symbol reading knowledge and knowing rules for the use and placement of music and text symbols in written music. On top of the basic reading instruction time and general music classroom time, students who are in a musical group are receiving an extra hour each week, at least, of instruction time in music. This extra time spent reading and working on literacy can be important in a child's life (Hansen et al., 2014).

Many teachers use music by having children sing or chant during scheduled or unscheduled break in their work. Music integration into literacy lessons provide students with concrete, hands-on experiences that are essential to developing each child's ability to reason, think, solve problems, analyze and evaluate texts (Sze & Yu, 2004). Some teachers use song to learn the content of reading or mathematics such as memorizing grammatical structure or multiplication tables, and so on (Hansen et al., 2014). Once students are old enough to be in a performing group, i.e. band, choir or orchestra, teachers of those students refine decoding and comprehension skills daily. Musical performance in any domain requires students to practice fundamental decoding and high-level thinking skills on a daily basis. The development of literacy skills leads to the self-critical and self-corrective skills needed to be an independent musician (Hansen et al., 2014).

Music involvement varies quite systematically by class and gender status, and such involvement holds implications for both math and reading achievement, and for younger children and adolescents (Southgate & Roscigno, 2009). Music participation, both inside and outside of school is associated with measures of academic achievement amongst children. Sight-reading music could have effects on reading fluency. Music teachers can encourage all students to take

part in some sort of musical group and using this action research to demonstrate the connection between that musical group participation and reading fluency will show how it will benefit these students.

Method

This study examined how sight-reading music in a musical group can help students in reading fluency. Data was collected and used a variety of data collection methods. Data was collected using state testing results, sight-reading tests as well as observations in classrooms.

Participants

Students who participated in this study were current students in the 6th grade. These students have been a part of a musical group for 2 years or have not participated in a musical group. This action research was done with 6th grade students in instrumental music and not in instrumental music. There was a total of 115 students who were involved in this action research study. This class was selected for this research because of the years of being in band and the testing cycle. Students were made aware of this study when given the Watkins-Farnum sight-reading test in band. Of those 115 students, thirty-seven of them did not participate in any musical group and seventy-eight of them participate in one or more musical groups. A musical group consists of band, choir or orchestra.

Participants were a mixed group of students. Seventy-eight of them were female and thirty-seven of them were male. Ninety-nine of the students that participated were regular education students, while 16 of them received special education services. This research was done in a school where 43% of the students were free or reduced lunch students. The total number of students who are free or reduced in a musical group was 43%. This is important because not all free or reduced lunch students have the financial support to take part in a musical group.

Measures

The MCA tests are given when students are in 3rd - 8th grade as well as 10th grade. The MCA tests are summative assessments of student achievement to evaluate students learning and

skills. The test information is available to use by all teachers using the Minnesota Department of Education website or contacting our district's testing coordinator. Test results are available to teachers by using Viewpoint, which has all of the testing data for all students within the school district. Test results used were taken from 4th grade and 6th grade.

Students were given the Watkins-Farnum sight-reading test in 5th grade and again in 6th grade. The sight-reading tests are given two times a year, once in the fall and again in the spring. The Watkins-Farnum test is a standardized achievement test used for all band instruments. This test can be given to track progress from year to year and as a sight-reading test. It useful to help music educators generate data on musical performance for students as testing has become a great part of every subject in school districts.

Procedures

The tests used were the MCA (Minnesota Comprehension Assessments) and the Watkins-Farnum sight-reading test. Students were given the Watkins-Farnum sight-reading test in 5th grade as well as the beginning of 6th grade. Students are also given the MCA tests in both grades.

Data for the Watkins-Farnum sight-reading test was collected during regular scheduled band lesson time with each student. Students were given the test during their lesson and were given as much time needed to do so. Students were given instructions to start at number one and stop at the end of each passage at the double bar line. Students were allowed to look over the test and were told to play each passage exactly how it was written. I started each passage by giving each student the set tempo. I either tapped out the tempo for them or used a metronome to count the beats. After the student began to play, I stopped tapping or shut the metronome off. No help was given to the students during the tests and they were not allowed to write in notes,

slide positions or fingerings of notes on the music. Students were instructed that they could only take between 15 – 20 seconds in between each passage.

They were to continue until they were unable to play anymore or reach a total of 13 mistakes. The 13 mistakes were counted as pitch errors, tempo changes, resting when not supposed to and not holding notes for proper values. There was only one mistake allowed in each measure. Each passage had a set number for a possible score. Taking the passage score and subtracting the errors in each passage would give the score for that passage.

Example: Student 1 had 3 errors in passage one. The total possible score in passage one was 13. So, student 1 score for passage one would be 10. Student 1 had 6 errors in passage 2. In passage 2, the total possible points were 10. The score for student 1 in passage 2 would be 4. The total number of mistakes so far is 9. Student 1 continues to number 3. The total possible points in passage 3 were 10. Student 1 makes 4 errors in passage 3. Student 1 score for passage 3 would be 6. The total number of mistakes so far is 13, which means Student 1 has completed the sight-reading test. The total score for Student 1 on the sight-reading test is 20, which was determined by adding the total scores from each passage.

The MCA tests were given in individual classrooms. Students were assigned Chromebooks and those were the computers students were to use on the test. Testing was scheduled for 4 days with 40-minute segments on each of those days. Students were able to stop and save their tests to come back the next day to finish where they left off. Students could finish before the 4 days but were given enough time to complete the entire test. Students were not allowed to leave the room or talk during the test. Staff proctors were not to help with any

answers but could answer simple questions for the students. Students with disabilities had the option of having the test read to them by their special education teacher.

The data collected from the Watkins-Farnum test was collected and tabulated to see how well each student did. Students were divided into instrument sections. After data was collected, I went through, and notated which students had improved over the past year from participating in band. Using that data, it was compared to the MCA scores in reading. MCA scores were collected from Viewpoint and the testing information for the 6th grade class. Students who were in a musical group were compared to those not in a musical group. The research done was looking at the increase or decrease in sight-reading scores and reading scores.

Results

This research was designed as a quantitative study on the impact of students who are in a musical group compared to those in a non-musical group and their reading fluency scores. Using the Minnesota Comprehensive Assessment test scores, it analyzed the impact being in a musical group can have on the improvement of test scores.

A dependent groups *t* test revealed that there was a statistically significant difference in 5th grade scores on the Minnesota Comprehensive Assessment reading tests ($M = 541.07$, $SD = 72.93$, $n = 115$) compared to the 6th grade scores on the Minnesota Comprehensive Assessment reading tests ($M = 644.51$, $SD = 73.46$, $n = 115$) with a moderate effect size $t(115) = -11.44$, $p < .05$, $d = 1.41$.

An independent groups *t* test revealed that there was a statistically significant difference in 5th grade Minnesota Comprehensive Assessment reading test scores comparing students in a musical group ($M = 556.71$, $SD = 10.42$, $n = 78$) to students who were not in a musical group ($M = 521.95$, $SD = 95.10$, $n = 37$) with a moderate effect size $t(115) = 2.22$, $p < .05$, $d = .51$. On average there was a 34.76-point difference between the groups.

An independent groups *t* test revealed that there was a statistically significant difference in 6th grade scores on the Minnesota Comprehensive Assessment reading test ($M = 644.51$, $SD = 73.46$, $n = 115$) when comparing students in a musical group ($M = 658.10$, $SD = 17.45$, $n = 78$) to students who were not in a musical group ($M = 615.62$, $SD = 123.22$, $n = 37$). With a strong effect size $t(115) = 3$, $p < .05$, $d = .48$. On average there was a 42.48-point difference between the groups.

Through this analysis, it was discovered that there was a significant growth between the 5th and 6th grade reading comprehension test. After comparing those test scores, the group was

broken down into two groups, musical vs. non-musical. The groups scores were analyzed from their 5th grade year as well as their 6th grade year. Through the comparison between the musical and non-musical groups, it was determined there was a significant point difference between the two groups and their scores on the Minnesota Comprehensive Assessments.

Discussion

Summary of Major Findings

The findings of this study indicate that students who participated in a musical group have a higher increase in their reading fluency test scores than those students who did not participate in a musical group. The data shows that students who were in a musical group in 5th grade scored on average 34.76 points higher on their Minnesota Comprehensive Assessment tests than those who were not in a musical group. After being tested again in the 6th grade, students who were in a musical group scored on average 42.48 points higher than those who did not participate in a musical group.

This study showed that study who participated in a musical group (band, choir, orchestra) show a higher growth on both the 5th and 6th grade Minnesota Comprehensive Assessment tests. Research also showed that scores increased over the year span for both group of students, musical and non-musical. It also showed that 68% of the class participated in a musical group, which is great to show for program cuts with in the school.

Limitations of the Study

The limitation of this study was the number of students who received special education services in each group. The total number of students who received special education services in the class was sixteen. Of those sixteen students, twelve of them were non-musical students and the other four were students who participated in a musical group. Because of this, the scores for the non-musical group may be lower because of the lower test scores of those students.

Further Study

Further study on this would be to include all the students in grades 5-12 grades that participate in a musical group compared to those who do not participate. Because the Minnesota Comprehensive Assessment tests are given to students in 3-8 grade and 10th grade, it would be

beneficial to study to find if being in a musical group for a longer length of time has the same effect on student's assessment tests.

Another path of study from this would be to look at other forms of tests given to students, such as the ACT and the PSAT to see if students who participated in a musical group in high school have higher reading comprehension scores than those that don't.

Further research could also be done using data from other schools with no musical programs and see the difference in scores to see if participating in a musical group does help raise scores of students on assessments.

Conclusion

This study was conducted to see if there is a connection between sight-reading music in a performance group and reading fluency test scores. Being a musical performance group can be beneficial for all students. There are many connections between reading fluency and reading music and being able to have extra opportunities for students to work on reading fluency is a great way for students to raise their reading test scores. Data was collected from the Minnesota Comprehensive Assessment tests from a class in both 5th and 6th grade. Tests scores were put into two groups, musical and non-musical.

This project is important to have for data for school that may have had their performance groups cut because of budget issues and teachers want to show administration results that being in a musical group has on students test scores. This study revealed that students who participated in a musical group achieved a higher growth on their Minnesota Comprehensive Assessment reading tests than those that did not participate in a musical group. Students who participated in a musical group had roughly a thirty-four-point higher score in 5th grade and a forty-two-point higher score in 6th grade than those who did not participate in a musical group within those same years.

While the movement in education is on in schools to assess all students in a variety of subjects, one cannot forget the impact being in a musical performance can have. Music can provide additional support to reading and can be beneficial to all students when taking the growing number of assessment tests in today's schools.

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