FACILITATING LITERACY ACQUISITION IN AT-RISK SECOND-GRADE STUDENTS USING A RHYTHMIC INTERVENTION: A CASE STUDY

by

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Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

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ABSTRACT

The purpose of this intrinsic, holistic case study was to describe and analyze the impact of a rhythmic intervention designed to support literacy skills in second-grade students at-risk of failure of state mandated reading assessment. The theories used to guide this study were Finkelstein (2001) and Hunt’s (1966) disability theory, and critical realism posited by Bhaskar and Danemark (2006). Critical realism, as applied to disability theory, reflects a unique combination of needs a person with disability faces: socio-economic, physical, biological, psycho-social and emotional, psychological, cultural, and normative. Research suggested musical instruction could be used to teach literacy skills as a by-product. The study sought to answer how second-graders and their teachers felt about the rhythmic intervention, and the students’ feelings as revealed through their personal artwork. The study took place in an urban Midwestern elementary school. Data were collected using open-ended questions during interviews with four teachers and nine students, documentation of reading levels, student artwork, and videos of the rhythmic intervention. The data were analyzed with QSR NVIVO, peer debriefing, member checks, and selected quotations. All of the students showed improvement in reading; however, the perceived success of the program was demonstrated in five themes: attention, confidence, connection, interventionist, and curriculum. Further research could focus on a larger sample over a more extended time period.

Keywords: learning disability, literacy, music, rhythm, second-graders, special needs
Dedication

This dissertation is dedicated in loving memory of my sister Jeanie Marie Dobbs.

November 24, 1959-October 29, 2010
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List of Abbreviations

Apparent Diffusion Coefficients (ADC)
Attention Deficit Hyperactivity Disorder (ADHD)
Center for the Improvement of Early Reading Achievement (CIERA)
Deformation-Based Morphology (DBM)
Diffusion Tensor Imaging (DTI)
Early Childhood Longitudinal Study (ECLS)
Electroencephalogram (EEG)
End of Year (EYO)
English Language Learner (ELL)
Fractional Anisotropy (FA)
Functional Magnetic Resonance Imaging (fMRI)
Individual Education Plan (IEP)
Inferior Longitudinal Fasciculus (ILF)
Institutional Review Board (IRB)
Intelligence Quotient (IQ)
International Literacy Association (ILA)
International Reading Association (IRA)
Learning Disabilities not Otherwise Specified (LD-NOS)
Magnetic Resonance Imaging (MRI)
Magnetoencephalography (MEG)
National Center for Educational Statistics (NCES)
National Early Literacy Panel (NELP)
No Child Left Behind (NCLB)

Rapid Automated Naming (RAN)

Response to Intervention (RTI)

Running Reading Records (RRR)

Socioeconomic Status (SES)

Specific language Impairment (SLI)

Wechsler Individual Achievement Test Fourth Edition (WISC-IV)

Wechsler Preschool and Primary Scale of Intelligence Third Edition (WPPSI-III),

Woodcock Johnson Tests of Achievement Third Edition Normative Update (WCJ III NU)
CHAPTER ONE: INTRODUCTION

Overview

The National Literacy Act of 1991 defines literacy as “an individual's ability to read, write, and speak in English, and compute and solve problems at levels of proficiency necessary to function on the job and in society, to achieve one's goals, and to develop one's knowledge and potential (U.S. House Committee on Education and Labor, 1991, p. 7). In today’s society, literacy, in a variety of media, is essential to academic, professional, and personal success (Dugdale & Clark, 2008; Snow, Burns, & Griffin, 1998). Multimodality acknowledges that literacy in the modern age comes from varied sources using visual, audio, and spatial patterns of meaning (Perry, 2012). Multimodality includes traditional reading and writing of print along with comprehension and communication necessary to assimilate ideas; additionally, literacy includes the utilization of technology or digital media in the same manner (Hsu, 2013).

Unfortunately, many children struggle with the act of reading (Cummins, 2007; Dugdale & Clark, 2008; Foster & Miller, 2007; Hernandez, 2012; Maxwell & Teplova, 2007; Stanovich, 2008).

Decades of research demonstrate the efficacy of, and higher return on funds invested in, early childhood literacy (Anne E. Casey Foundation, 2010; Bolduc, 2008; Henk, Morrison, Thornbury, & Raya-Carton, 2007; Paciga, Hoffman, & Teale, 2011; Riley-Ayers & Barnett, 2012; Vadasy & Sanders, 2013). The High/Scope Perry Preschool Study Through Age 40 is a long-term project on the difference that early intervention can make for children and society. The data show a benefit-cost ratio of $16:$1, an annual return of 18%, and a society return of 16% (Schweinhart et al., 2005).
Former Federal Reserve Chairman Ben Bernanke (2007) continued to note the advantage that quality pre-school education has on the individual and society. Bernanke reiterated the high positive impact early education has on completion of higher education. Learning is a life-long process; however, early education brought the greatest yield in monetary value to society. In addition, early education has a diminishing effect on rates of teen pregnancy, dependency on welfare, and other social problems.

Early intervention with pre-literacy skills is a crucial element to literacy achievement. Early literacy is defined as affecting children from birth through age five (National Early Literacy Panel [NELP], 2008). Research-based curricula consist of three basic elements: alphabet knowledge, phonological awareness, and oral language (Paciga et al., 2011; Wasik & Hindman, 2011). In addition, the NELP (2008) found rapid automatic naming (RAN) of letters, digits, objects, and colors with phonological memory significant in effective curriculum.

However, the curriculum itself is not the only element of a successful literacy program. Research-based curricula and RAN are most effectively presented through authentic play (Nitecki & Chung, 2013; Paciga et al., 2011; Roskos & Christie, 2011). Authentic play utilizes natural expressions of children and morphs them into learning experiences (Brand & Dalton, 2012; Nitecki & Chung, 2013; Roskos & Christie, 2011). One research-based intervention utilizing natural expressions uses music in literacy lessons (Bolduc, 2008; Bond, 2012; Standley, 2008).

develop. Additionally, musical intelligence is believed to positively influence all the intelligences (Helding, 2010).

Music as a tool accesses learning potential at the earliest age. Infants who were exposed as fetuses to music, will recognize the tune up to 16 weeks after birth (Partanen, Kujala, Tervariemi, & Huotilainen, 2013). Likewise, Bond’s (2012) literature review of articles covering the use of music in early childhood education noted the development of auditory perception, phonological memory, and metacognitive knowledge needed for linguistic growth. Additionally, music can be successfully targeted at specific reading problems (Moreno, Friesen, & Bialystok, 2011). For example, Moreno, Friesen, and Bialystok (2011) compared four to six year-old children studying art and music. They found that “musically trained students had significantly higher scores on a vocabulary test and on a receptive grammar test than untrained students, despite there being no group differences at pretest” (Moreno et al., 2011, p. 167). These results have been repeated in a large number of studies (Bolduc, 2008, 2009; Bond, 2012; Corrigall & Trainor, 2011; Darrow et al., 2009; Kouri & Telander, 2008; Lucas & Gromko, 2007; Piro & Ortiz, 2009; Rickard, Vasquez, Murphy, Gill, & Toukhsati, 2010; Standley, 2008).

Positive gains in reading have also been significant in children with reading disabilities (Benson, 2000; Forgeard et al., 2008; Huss, Verney, Fosker, Mead, & Goswami, 2011; Overy, Nicolson, Fawcett, & Clarke, 2003; Strait, Hornickel, & Kraus, 2011). Bolduc (2009) stated, “By favoring the development of music perceptions abilities, we help children increase their phonological memory and acquire metacognitive abilities without relying exclusively on reading and writing activities” (p. 44).

This chapter includes relevant background, situation to self, plus the problem and purpose statements. In addition, the research questions are introduced and the research plan is described.
The chapter concludes with the study delimitations and limitations followed by pertinent definitions.

**Background**

The importance of literacy skills—reading and writing—has evolved over time as demanded by the needs of society. The earliest writing dates from 3500 B.C. by the Sumerians in Mesopotamia (Oriental Institute University of Chicago, n.d.). The scroll format developed into books around 23 B.C. in the Roman Empire (EBSCO, 2014). Books had to be laboriously produced by hand until the invention of the printing press by Johannes Gutenberg in 1488. However, the ability to read was a skill reserved for people who needed the expertise, not the general population (EBSCO, 2014).

The Protestant Reformation, with its call for individual priesthood, led the demand for total literacy to enable the population to read the Bible for themselves (Gutek, 2010). This pro-literacy view moved to America with the Puritans and resulted in a higher literacy rate in the colonies than in Europe (EBSCO, 2014). The Industrial Revolution of the 18th and 19th centuries allowed large numbers of books to be printed cheaply. This made recreational reading common and reinforced the need/desire for public education (EBSCO, 2014). Ryan and Sinning, (2011) produced a four-country/10-year study that noted the increasing need for literacy in the workplace. They listed six empirical findings: The skill level of literacy changed as the requirements for literacy increased; higher education translated to a higher skill set needed at work; the measurement of literacy produces changes in the skill requirements in varied occupations; Literacy skills are better developed in full-time versus part-time work; larger companies show a greater use of literacy skills; and older workers use more literacy skills than their younger counterparts (Ryan & Sinning, 2011).
In a society where even blue-collar jobs demand literacy and media literacy skills, this overarching discipline is paramount in the learning process for students (Orme, 2006). Unfortunately, many children struggle with the ability to read. For example, the National Assessment of Educational Progress found 33% of fourth graders in America read below the “basic” level (NCES, n. d.). “Basic Level” for fourth grade is defined as the ability to give a conclusion or interpretation based on pertinent information found in the text. Furthermore, they should be able to support their inferences with details and the meaning of words in the text (Institute of Education Sciences [IES], 2013). Early intervention is considered essential for future success in a literacy-rich environment (Henk et al., 2007). Many curricula and theories have been developed to describe and assist in the process of learning to read.

For example, music has been used for centuries to teach concepts beyond just musical performance and composition. Music has been used in various genres, including vocal and instrumental, to teach literacy skills with positive effects on reading abilities (Bolduc, 2009; Corrigall & Trainor, 2011; Lucas & Gromko, 2007; Moreno et al., 2011; Piro & Ortiz, 2009; Strait et al., 2011). Additional research has shown significant improvement in children with reading disabilities (Benson, 2000; Forgeard et al., 2008; Huss et al., 2011: Overy et al., 2003). Because music and literacy utilize the same brain region, the corpus callosum, research suggests musical instruction can be employed to teach literacy skills as a by-product rather than the primary discipline (Overy et al., 2003; Strait et al., 2011). For example, a student learning to play the drums would have a measurable improvement in his reading abilities without additional effort in literacy. Moreover, data have shown that children with disabilities in literacy typically show problems with tonal production and rhythmic reproduction (Bolduc, 2008; Bond, 2012; Standley, 2008).
A procedure to develop literacy skills in young students utilizing this method could have an impact on how children learn and their appreciation of literacy. While many studies have been conducted on successfully using music in aiding literacy acquisition (Bolduc, 2008, 2009; Butzlaff, 2000; Forgeard et al., 2008; Huss et al., 2011; Kouri & Telander, 2008; Lucas & Gromko, 2007; Moreno et al., 2011; Piro & Ortiz, 2009; Rickard et al., 2010; Standley, 2008), no research currently exists using a rhythmic intervention to directly impact the literacy skills of second-graders in a class setting. The ability to recognize rhythmic variations has been noted as a deficiency in students with reading disabilities (Bolduc, 2008; Bond, 2012; Standley, 2008; Thomson, Leong, & Goswami, 2013). Moreover, musical training, including the ability to recognize and repeat rhythm, has a noticeable effect on the brain (Fujioka, Ross, Kakigi, Pantev, & Trainor, 2006; Habib & Besson, 2009; Kujala et al., 2001; Moreno et al., 2009; Skoe & Kraus, 2012; Tierney & Kraus, 2013; Watanabe, Savion-Lemieux, & Peahume, 2007). Tierney and Kraus (2013) stated, “It is possible that training in rhythmic abilities including beat synchronization practice could lead to a more stable neural representation of sound, in addition to improving linguistic skill, such as phonological awareness and reading” (p. 14985).

Employing percussion methodology to develop rhythmic perception could lead to greater understanding of literacy demands by students.

**Situation to Self**

My motivation for performing this study was the advancement of literacy through the medium of music for children at-risk of literacy failure. Because I have triple licensure in music, reading, and special education, I have anecdotally noted the positive effect of musical training on academic areas and the lack of musical ability especially in matching rhythm and pitch in some children with special needs.
As a core philosophy, I believe in absolute truth. My ontology, or nature of reality, has a positive stance. I believe truth exists and was “observable, stable, and measurable” (Merriam, 2009, p. 8). However, the events in people’s lives are viewed or reflected through their personal lens and are a reflection of the truth they acknowledge and accept. The literature on which this theory was based became “a larger explanation for our [my] descriptive and thematic analysis” (Creswell, 2013). My goal was to embrace an intrinsic case study with a holistic or complete analysis (Creswell, 2013). The methodology utilized multiple sources to render a detailed analysis of this bounded case. These resources included observation, interviews, documents, and pictures of the event drawn by the students. The boundaries of this case were set by the implementation time period of the six-week intervention. Observations, interviews, documents, and pictures were all taken from this specific time frame. The individuals in the case were defined as the students and their teachers involved in the intervention.

**Problem Statement**

A deficiency in literacy skills in society presents a problem because of the necessity of literacy for success in academics, in life experiences, and in the work force. However, according to scholars, many children not only fail to reach basic literacy levels, but also miss the opportunity to improve their mental abilities, and they handicap their contributions to themselves and society at large (Gavriliuk, 2007; Horning, 2007; Jugwa, 2010). These effects appear in four areas: psychological, economic, physical, and social well-being (Maxwell & Teplova, 2007). Literacy skills have been proven most effective when developed early. Children who lack early literacy skills continue to be hindered in their academic and job careers (Riley-Ayers & Barnett, 2012).
Children with reading disabilities are at a disadvantage for obtaining the necessary skills for further advancement, not only in reading, but in other subjects, through the “Matthew” Effect of the poor-getting-poorer and the rich-getting-richer (Stanovich, 2008). Additionally, many states now require the passage of literacy tests before advancement to the fourth grade. Kindergarten, first grade, and second grade are the years a child learns phonemic awareness, phonics, vocabulary, fluency, and comprehension basics. They learn alphabetic awareness and how words are put together individually and as cohesive units. Third grade is viewed as a watershed point of learning to read versus reading to learn. Therefore, teaching students literacy skills before that point becomes the highest priority.

Curriculum decisions for development of literacy skills are grounded in research-based methods. One of these methodologies was the implementation of music-based curricula, which have proven successful over time (Bolduc, 2008; Bond, 2012; Standley, 2008). Many studies note the common brain area usage for music and reading skills (Atterbury, 1983; Cole, 2011; Foran, 2009; Hallam, 2010; Hyde et al., 2009; Overy et al., 2003; Posner & Patoine, 2009; Strait et al., 2011; Telesco, 2010; Wandell, Dougherty, Ben-Shachar, Deutsch, & Tsang, 2008). Likewise, students with reading disabilities consistently demonstrate difficulties with pitch and tonal reproduction (Atterbury, 1983; Cole, 2011; Forgeard et al., 2008; Huss et al., 2011; Lucas & Gromko, 2007). Additionally, combinations of prosodic/rhythmic and phonemic cues can produce positive effects in students with developmental dyslexia. Thomson, Leong, and Goswami (2013) noted, “This may be especially true for those who appear resistant to conventional phonics training methods” (p. 139). Therefore, the problem of this study is the impact of a rhythmic intervention on reading skills in second-grade students at risk for failure in literacy.
Purpose Statement

The purpose of this intrinsic, holistic case study is to describe and analyze the impact of a rhythmic intervention designed to support literacy skills in second-grade students at-risk of failure of state mandated reading assessment. The interaction of literacy and music was generally defined as visual decoding of materials presented first in an aural manner/rhythmic intervention.

The theories used to guide this study were disability theory posited by Finkelstein and Hunt (Swain, French, Barnes, & Thomas, 2014) and critical realism posited by Bhaskar and Danemark (Bhaskar & Danemark, 2006; Danermark, 2001). Critical realism, as applied to disability theory, reflects the unique combination of needs a person with disability faces: socio-economic, physical, biological, psycho-social and emotional, psychological, cultural, and normative.

Significance of the Study

Decades of research demonstrate the effectiveness of music as an intervention in literacy that produces improvement in academics and behavior (Atterbury, 1983; Benson, 2000; Bolduc, 2008; Hansen & Milligan, 2012). Research noted positive effects in performance and attitude, which can carry over to other areas of the students’ lives (Corrigall & Trainor, 2011; Hille, Gust, Bitz, & Krammer, 2011; Moreno et al., 2011). Furthermore, music curricula demonstrated positive learning achievement in students with disabilities including dyslexia, autism, speech disabilities, and reading disabilities (Benson, 2000; Forgeard et al., 2008; Huss et al., 2011; Overy et al., 2003). Musical interventions held the promise of engaging students in a novel and enjoyable experience with rhythm while simultaneously building capability in literacy.
This case study built upon the evidence found in implementing a small time-line study based on simple rhythmic teaching techniques to produce gains in reading levels (Bhide, Power, & Goswami, 2013; Hyde et al., 2009; Long, 2014). Deficits in matching rhythm were found in both children and adults with dyslexia, and prior studies showed improvement with rhythmic interventions (Bhide et al., 2013; Hyde et al., 2009; Long, 2014; Thomson & Goswami, 2008; Thomson et al., 2013; Wolff, 2002).

The East Elementary school district was rated C in 2014; the system was rated D in 2013. The East Elementary school is rated C (State DOE data). They were under a penalty for percentage of students showing low growth. The state mandated reading test showed a 93.1% pass rate with 6.9% failure. This number was above the state 90.8% and the district 86.8%.

Conversations with the school staff revealed the school was highly motivated to demonstrate growth in their students and improve their state rating. The principal had a special education background and promoted research-based strategies. The outcome of this study could offer the innovation the school and district sought with minimal cost and time. Additionally, the school and district had a large population of ELL students. Dyslexia, across languages, has shown speed deficits (Ziegler, Perry, Ma-Wyatt, Ladner, & Schulte-Körne, 2003). The rhythmic intervention does not rely on understanding English to build the ability to read.

The outcome of this case study may contribute to the data that suggested implementation of rhythmic intervention to improve reading was effective for the students academically as well as emotionally. In addition, with short term professional development, general education teachers, reading resource teachers, and music educators could reproduce the program. The study also added credence to the importance of music in curriculum in developing not only music knowledge but in developing the mind to function better in academic learning. Moreover,
A rhythmic intervention was cost-effective to the school system because simple rhythmic reproduction was produced through a variety of mediums, including the students’ bodies themselves (Long, 2014).

**Research Questions**

The research questions for this study were viewed through the theoretical framework of disability/critical realism (Agee, 2009). Therefore, the perceptions of the children in the study were of great importance. Their interaction with the percussion exercises and their accuracy were important to the goal of strengthening the region of the brain associated with literacy skills. The goal of the intervention was to observe the participants’ performance and their perception of literacy. The participants’ descriptions of the event was essential (Bolduc, 2009; Rickard et al., 2010; Yim & Ebbeck, 2009). In addition, the teachers involved in the study noted the children’s general mood and behavior along with their ability to perform in literacy-related activities. Moreover, the teachers were asked about their perception of their ability to perform the intervention on their own (Bainger, 2010; Kim & Kemple, 2011; Russell-Bowie, 2009). Because the participants were young, student-drawn pictures with their descriptions were used to ascertain their emotional and behavioral response to the rhythmic intervention (Choi, Lee, & Lee, 2010; McFerran, 2009; Sassen, 2012; Wolfe & Noguchi, 2009). Finally, because of previous research, it was expected that the percussion exercises would strengthen the literacy skills of the students (Piro & Ortiz, 2009; Rickard et al., 2010). Yin (2014) noted the appropriateness of case study research in utilizing quantitative data and the thick description associated with a qualitative study. The documents will also serve as an additional “record of activity that the researcher could not observe directly” (Stake, 1995, p. 68).

Therefore the following research questions framed this investigation:
RQ1. How do second-grade students describe their learning experience with a rhythmic intervention over a bounded time period?

RQ2. What are the perceptions of general education teachers about a rhythmic intervention and their students’ response to the intervention?

RQ3. What do descriptions and pictures drawn by second-grade students reveal about their personal feelings about a rhythmic intervention and their literacy instruction?

Research Plan

This qualitative study used an intrinsic, holistic case study approach. This methodology was appropriate because the focus of the study was a holistic analysis of a “real-life, contemporary context” in a school setting (Creswell, 2013, p. 97). Stake (1995) also posited “cases of interest in education . . . are people and programs . . . for both their uniqueness and commonality” (p. 1). Moreover, a “case” permits a “real-world perspective” of the case in a school performance (Yin, 2014, p. 4). Lastly, a case study was useful in research where the context and the phenomenological variables could not be easily separated (Merriam, 1998).

The six-week program consisted of 12 lessons of rhythmic intervention with a constructed curriculum given to 15 children at-risk of failing state mandated reading assessment. Additionally, I believed my personal experiences would help create a bond between the participants and me and facilitate good description of specific responses and setting of the case. A single-case analysis was appropriate because there were no other cases with which to compare, and it was a suitable research design when trying to understand the process and its effect (Merriam, 1998). I followed a linear-analytic approach noting “the problems, the methods, the findings, and the conclusions” (Creswell, 2013, p. 238). Additionally, the question of “how” and “why” the rhythmic intervention worked or alternatively did not were best answered by a case
A qualitative case study project was better able to give the unique perceptions of the limited number of individuals involved in the case as reproduced in narratives and experiential chronicles (Stake, 1995).

**Delimitations and Limitations**

This study was delimited to participants who were in second grade at East Elementary School. The elementary school was in an urban Midwest setting. Third grade is considered a pivotal grade for literacy; many states have high-stakes testing in literacy to determine grade-advancement. Preparation for this test is a primary focus of schools in early elementary grades. While first grade may still be considered a learning of basic skills, second grade, requires a more detailed analysis of the text. In addition, second grade teachers are fully aware of the rigors of third grade literacy and work to adequately prepare their students for these demands. Also, students experience more success the earlier the intervention. For this reason, second grade was chosen. Additionally, children were selected for their perceived literacy skills and their identification as at-risk students. A bounded case, by definition, is a small sample in a set timeframe with as in-depth description and analysis possible. This school and second grade met the requirements of a typical case study; it was representative of second-grade students at-risk of failure of state mandated assessment (Gerring, 2007).

Limitations or possible weaknesses in the study were as follows. Most of the teaching staff and I were Caucasian females. However, the school and community were a diverse racial mix. Therefore, unintentional bias in the teachers, administration, and researcher was possible.

I constructed and implemented the rhythmic intervention because one was not available commercially. While there were rhythmic programs including Orff, Dalcroze, and Kodály, a combination of these three and Tataku was not available. The intervention sought to model
needed rhythmic training but may not have employed every best example. However, I have taught music for 30 years and experienced in these methods. Care was given to choose the most effective part of the curricula.

The setting for this study was one elementary school in an urban, racially diverse area, and the small sample size may limit the study’s transferability. The challenges of East Elementary School may not be applicable to other settings. Furthermore, each racial/cultural group in the study may have a different response to the surrounding societal factors and curriculum. In addition, the participant group was a convenience sample. Because I worked for the school district, albeit at a different school and grade level, I was given access to these participants.

The student participants consisted of second grade students and may not be applicable to other ages. Additionally, the student participants were considered at-risk of failure of their state’s mandated reading assessment. The test itself and the criteria for being “at-risk” may change in different circumstances and settings.

As the only researcher, I was the sole analyst of the transcripts and data from the case study. Moreover, as a music, reading, and special education teacher, I expected the intervention to be successful. However, bias was mitigated through peer reviews, member checks, plus thick and rich descriptions.

The interviewees may have had self-reported bias. The teachers’ and students’ perspectives may have had selective memories, condensing of events, exaggerations, and attribution of events to incorrect sources. The children in particular may have reflected a more positive effect of the intervention to please me. This limitation was addressed through follow-up questions and analysis of the transcripts.
Because the study was only 12 lessons over six weeks, the length of the study could be a limitation; however, research noted the effectiveness of musical interventions does not seem to be limited by the time-span of application (Standley, 2008).

**Definitions**

1. **At-Risk Students** – For the purpose of this research, students deemed at-risk were children that teachers and administration were concerned would fail the state mandated assessment for literacy. The participants were at least one year behind the state standards for reading. These students were not necessarily a part of the special education program or officially diagnosed with a reading disability.

2. **Entrainment** - Entrainment refers to the physical phenomenon in physics that notes the tendency of objects in motion on the same surface and in near proximity to either swing in rhythm or within 180 degrees of each other. In music, entrainment refers to the entire group being in the same rhythmic timing (Thomson & Goswami, 2008).

3. **Functional Magnetic Resonance Imaging (fMRI)** - Functional magnetic resonance imaging is a tool to demonstrate functional neuroimaging through magnetic resonance imagining. The non-invasive procedure shows the difference between oxygen-rich blood and oxygen-poor neurons graphing where brain activity is located (Forgeard et al., 2008).

4. **Rapid Automatized Naming (RAN)** - The process of rapidly naming objects including colors, numbers, letters, shapes, and objects (Goswami, 2011). The ability to be able to rapidly name objects and symbols is associated with good readers.

5. **Rhythmic Intervention** - For this study, rhythmic intervention denoted a series of 12 lessons employing rhythm as a sole tool to improve reading. The 10 components
reflected principles established in Dalcroze, Kodály, Orff, Tataku, and research-based reading instruction.

6. *Rise Time* - Rise time is the difference between stressed and unstressed syllables in segmental phonology (Beattie & Manus, 2012). For example, “ch” has a faster rise time than “sh”.

7. *Spoonerisms* - Spoonerisms are a language switch in vowel, consonant, or morpheme (Thomson et al., 2013). While these errors can be deliberate, for this research, the Spoonerisms will be considered unintentional. For example: Herbert Hoover – Hoobert Heever.

8. *Temporal Timing Theory* - Temporal timing is the ability to predict or anticipate when the timing occurs in sequential organization of sounds in both music and speech (Goswami, 2011). Temporal timing theory reflects the fact poor readers are associated with poor rhythmic reproduction.

**Summary**

This intrinsic, holistic case study employed a solely rhythmic intervention to assist in literacy acquisition for at-risk second graders. Literacy is essential for the ability to build a strong knowledge base. In addition, fluency in literacy facilitates employment, social interaction, and personal goals. Furthermore, multimodality is a strong element in literacy needs and encompasses various kinds of literacy including all forms of written media. Likewise, early intervention has proven the best strategy when teaching typical and slow readers. Moreover, Gardner’s multiple intelligence theory posits music as the first intelligence to develop beginning in utero (Gardner, 1983, 2006). Even with concentrated study grounded in research-based
methods, some children struggle to learn to read. Additionally, music has been proven a significantly successful intervention method in remediation with at-risk students.

Research suggests students with dyslexia have rhythmic and tonal deficits (Bond, 2012; Standley, 2008; Thomson et al., 2013). Additionally, medical studies have noted music and literacy skills were processed in the same area of the brain, the posterior callosum (Overy et al., 2003; Strait et al., 2011). Furthermore, training in rhythm has been shown to produce a more stable neural retention of sound, improve grammar, and phonological awareness in a short-time period (Goswami, Huss, Mead, Fosker, & Verney, 2013; Tierney & Kraus, 2013).

This case study utilized twelve, 30-minute rhythmic interventions over six weeks in East Elementary School in an urban Midwest setting with 15 at-risk second grade students. This intrinsic, holistic case study questioned the perception of the students and teachers involved in the study. The expected result was an improvement in the students’ perception of their literacy skills.
CHAPTER TWO: LITERATURE REVIEW

Overview

Literacy skills are essential in the academic setting to understand and demonstrate competency in all disciplines, including mathematics, science, history, social sciences, and English. A wide range of careers are literacy based and require reading comprehension and written skills. As children enter school, some struggle with reading. According to the National Center for Educational Statistics (NCES, 2011), 33% of fourth graders struggle to learn the fundamentals of reading. Research has noted that readers who struggle in third grade often do not graduate from high school (Hernandez, 2012; Lloyd, 1978; Schweinhart et al., 2005; Stanovich, 2008). Intervention-resistant students can respond to novel curriculum, or one designed to engage the senses and the mind, based on musical experiences (Lysne, 2013; Thomson et al., 2013). Music holds particular interest as an intervention because music and literacy processes originate in the auditory cortex (Kujala et al., 2001; Moreno et al., 2009; Oechslin, Van De Ville, Lazeyras, Haurert, & James, 2013; Skoe & Kraus, 2012; Tierney & Kraus, 2013; Trainor, 2012; Watanabe et al., 2007). Children who struggle with reading typically demonstrate problems with matching pitch and/or rhythm. Additionally, music, and in particular rhythm exercises, have been shown to have a significant effect on social development and attention (Geist & Geist, 2012; Gerry, Unrau, & Trainor, 2012; Sassen, 2012). Therefore, a musical curriculum holds promise as an intervention that can improve reading and attitude without being a standard literacy program of study.

This chapter contains literature resources that support the theoretical unpinning of the study and its application to the participants. I examine the history of literacy. Furthermore, the benefits of early literacy interventions and a delineation of successful interventions are noted.
Music and specifically rhythm are introduced as viable literacy interventions, and the importance of a positive classroom culture is probed.

**Theoretical Framework**

Individuals demonstrate different understanding and viewpoints reflective of their experiences (Diener & Crandall, 1978). While groups may have shared understanding, the individuals involved cannot share every fact, feeling, and thought process. Additionally, individual life experience is reflected in how a person interprets events and information (Li et al., 2014). Therefore, an ontological assumption was selected for this study to allow multiple realities because the case study involves different individuals (Creswell, 2013). The ontological assumption was demonstrated through using multiple data sources, quoting the participants, and clearly presenting diverse viewpoints (Creswell, 2013).

Moreover, the framework for the study was also positivist. A positivist form of research posits that knowledge is observable, stable, and measurable (Merriam, 1998). Furthermore, a positivist viewpoint was a reflection of my personal belief in the pre-existence of knowledge and our deepening understanding of that wisdom. However, as a qualitative intrinsic, holistic case study, there was not an emphasis on measurable knowledge.

In addition, an interpretive research stance reflected the multiple realities each person builds in his or her mind. With school labeled as the “lived experience” and the education itself as the “process,” interpretive research seeks to understand the “meaning of the process or experience” (Merriam, 1998, p. 4). The mix of qualitative (interpretive) and quantitative (positivist) is one of the “ways that case study research goes beyond being a type of qualitative research” (Yin, 2014, p. 19).
Two main theories served as a foundation for this intrinsic, holistic case study: disability theory and critical realism. Both of these theories emphasize the individual’s personal experiences in society as a whole versus a generalized view of society.

**Disability Theory**

Disability theory is a form of social oppression that includes the social imposition of restrictions on the activities of people with impairment and the socially engendered undermining of their psycho-emotional wellbeing (Thomas, 2004). Vic Finkelstein and Paul Hunt agreed that disability theory conveys a social relational understanding (Thomas, 2004). Finkelstein and Hunt were both United Kingdom citizens who personally experienced disability; Finkelstein incurred a spinal injury in sports, and Hunt was diagnosed with Muscular Dystrophy (UKDFEA/DED, 2004). They stated, “Society is disabling us and therefore it is society that has to change, not disabled people” (Finkelstein, 2001, para. 3).

Disability theory arose from the Civil Rights movement of the 1960s and 1970s. In addition, four main theoretical perspectives in disability research have emerged from disability theory during the past 50 years, including individual essentialist, contextual essentialist, linguistic or cultural model, and relative interactionist (Bhaskar & Danermark, 2006).

The first recognition of disability as a theory centered on the individual essentialist and was associated with medical problems (clinical or biological model). The individual essentialist viewpoint sees the body itself as the problem; therefore, the treatment was biological or neurological and concentrated on remedial therapy (Bhaskar & Danermark, 2006). The socio-economic perspective was the reality of the biological model.

In the 1960s, a new model was posited by members of the disability movement. Contextual essentialist stated that disability was a consequence of barriers in the environment
rather than a problem with the body. “A clear distinction between impairment and disability” resulted in the idea that the body was not at fault but the surroundings in which it was situated caused the problem (Bhaskar & Danermark, 2006, p. 281). Like the biological model, the contextual model was focused on the socio-economic reality of disability.

In the 1990s, a movement that reflected the lived experiences of the person with the disability became important. The linguistic or cultural model, from the social constructivist, stressed the effects of cultural views on disability. Values and attitudes toward disability were what defined disability. Different cultures viewed disability through varied lenses, and this was reflected in treatment and social contact. In this model, the ideology of plurality and diversity was important (Bhaskar & Danermark, 2006). Furthermore, the socio-economic perspective was displaced by focus on the cultural barriers.

In 1994, Nancy Eiesland published *The Disabled God*. Eiesland brought theology into social disability. Disability theology is “a belief that there is nothing inherently wrong with a person who experiences disability, a commitment to justice for people with disabilities, and a fundamental conviction that theology and disability have something significant to say to each other” (Creamer, 2012, p. 339). A person with a disability herself, Eiesland noted that traditional Christianity has viewed disability alternatively as a sin, a form of punishment, a witness to others, an opportunity to witness God’s healing, a test of faith, or an act of God (Creamer, 2012). However, Eiesland saw the resurrected Christ as one who asked his followers to touch his scars. Christ’s actions show disability not as a consequence of personal sin. Additionally, disabilities do not exempt a person from leadership in the church. Eiesland also posited that people with disabilities are in the unique position to show God’s love through tolerance, justice, and inclusion (Creamer, 2012).
The relative interactionist utilizes the critical realism theory. Critical realism takes each of the above cited theories and combines the body, environment, and cultural aspects as important and necessary parts of disability theory (Bhaskar & Danermark, 2006). Bhaskar and Danermark (2006) stated that “...in critical realism...the exact weight, role and influence of particular kinds of mechanism is something that must be determined empirically in each specific case” (p. 281). Rather than a socio-economic or cultural perspective, critical realism employs a meta-theoretical conclusion. The combination of factors means each is unique and the mix of body, environment, and cultural will differ (Bhaskar & Danermark, 2006).

**Critical Realism**

While critical realism has its roots in Kant, Marxism, and neo-Kantianism, Bhaskar has been the main critical realism theorist since the 1970s. The critical realist approach to disability acknowledges the reality of the person, the disability, and the social and cultural environment (Bhaskar & Danermark, 2006). Critical realism posits a holistic approach; the disability is a combination of realities. The physical, biological, psychological, psycho-social and emotional, socio-economic, cultural, and normative are combined in various degrees for each individual situation (Watson, 2012). In critical realism individuals have different combinations and needs and challenges; therefore, their situations need individualized examination and treatment.

Disability cannot solely be described as a health problem residing in the individual, nor is it solely the result of oppressive practices, and neither can it be reduced solely to discourse. “Rather, disability arises from the complex interaction between the person with impairment and the complete physical, human-built, attitudinal and social environment” (Watson, 2012, p. 198). Critical realism was an essential foundation of the present intrinsic, holistic case study. The
environment, curriculum, society, and learning disabilities examined in this study reflected differing elements for each student.

Critical realism embraces the idea of different layers of theory or interdisciplinary research. The theories and/or research combination are the very definition of critical realism Danermark (2001). Danermark (2001) explains interdisciplinary research as an ‘integration of data, general assumptions, techniques and methods from different disciplines” (p. 2). Moreover, the combination of knowledge allows for “deeper knowledge and new explanatory models, and . . . new approaches and methods” (Danermark, 2001, p. 2).

Danermark (2001) clarified five features of interdisciplinary research and critical realism: stratified ontology, transitive and intransitive dimensions of reality, causation in terms of generative mechanisms, contextualization, and empirical reality. In addition, Danermark applied each feature to an example in disability research.

The first feature is stratified ontology or levels of definitions. The three levels of ontology domains are labeled empirical, actual, and real. The empirical domain is one’s experience of what, in fact, happens. The actual domain is the event including all features, whether observed or not observed. The real domain is considered the deepest level of reality and results in a “deeper structure of reality” (Danermark, 2001, p. 4). Additionally, Danermark posited a descending order of hierarchical ordered levels: social sciences, psychological sciences, biological sciences, and molecular sciences. An occurrence at one level does not necessarily affect the others. Critical disability theory does not dismiss the reality of each level but uses only what is needed for the individual.

Second, there are transitive and intransitive dimensions of reality noting the reality independent of ourselves versus the reality of a social construct. Danermark (2001) gave the
example of dyslexia. In societies that value literacy, dyslexia becomes a disability; however, in a society that does not need literacy, the disability does not exist.

Next, there is causation in generative mechanisms, which are both micro and macro. While some argue there are only micro mechanisms, Danermark (2001) noted the foundational or macro mechanisms through deviation of social norms. Deviation can cause stigmatisms, but this may be counteracted by other variables like a good support team or strong self-esteem (Danermark, 2001).

Fourth, contextualization is important. Events are not isolated or compartmentalized. They exist in a complex environment with many contributing factors. The effect or stigmatism of gender, race, culture, class, and others differs individually. Danermark (2001) stated, “The context determines how the mechanism is empirically manifested” (p. 9). An individual with loss of hearing as a work-related consequence is viewed differently than a Deaf person.

Finally, the realities of empirical manifestations are expressed differently with different variables. The fluctuations mean quantitative research cannot adequately define highly complex situations because it does not take into account the context for the data (Danermark, 2001). The data must be considered as a tendency rather than regularity. Danermark (2001) states, “statistical analysis cannot be dismissed but from a crucial realist perspective it more often is the starting point for looking for causal explanation than the final phase of research” (p. 10).

Critical realism as applied to disability theory tries to address the whole person: the body, the social aspects, and the identity of self. Moreover, there are things we do not understand or know outside of our own knowledge. There is more truth to be discovered. “Disability from this viewpoint is neither the sole product of the impaired body or a socially oppressive society. Rather, it is . . . an emergent property, one involving the interplay of physiological impairment,
structural enablement/constraints, and socio-cultural elaboration over time” (Williams, 1999, p. 813).

**Related Literature**

The purpose of this intrinsic, holistic case study is to describe and analyze the experience of second-grade students at-risk of literacy failure of state mandated reading tests utilizing a rhythmic intervention. The case study juxtaposed literacy, disabilities in literacy, and music to formulate positive connections in the brain to improve reading abilities. The theoretical underpinning of disability theory and critical realism theory was reflected as each element of literacy, special needs, and music adds to the most complete picture of the intrinsic, holistic case study. The following literature review highlighted pertinent data in the areas of literacy, special needs, music, and brain research.

**Literacy**

The history of literacy can be subdivided into five general categories: oral, alphabet, scrolls and manuscripts, printed works, and computer (Stock, 2008). Each era has required a change in how literacy is perceived and its value to society.

**Oral traditions.** Folk or oral traditions can be found in every society (Thompson, 2000; Vansina & Wright, 1973). For most of human history, oral traditions have dominated. However, even with the advent of literacy, there remained a large era of “restricted literacy” (Lyons, 2010, p. 13). For example, ancient Egypt is estimated to have had a 1% literacy rate (Lyons, 2010). Oral traditions can be divided into three categories: oral only, print dominated, and a mixture of the two (Lyons, 2010). Law was determined by oral tradition rather than writing well into the 12th and 13th centuries (Lyons, 2010). While a culture could be deemed oral, the desire to leave behind a legacy in written form is seen in cave drawings and hand prints from the Neolithic
period (Baldwin, 2007). Eisler (1995) stated, “Neolithic art is a kind of language” (p. 17). However, the need for a more complex and useable means of communication led to the adoption of written language. Moreover, written language and the reading thereof changed the human world and the use of the human body. Baldwin (2007) posited that the development of writing led to a shift from right brain oral emphasis to left brain dominant reading and writing.

**Alphabet literacy.** The Sumerians are credited with the invention of the first written language, cuneiform, around 3200 B.C. (Houston, 2011; Martin & Cochrane, 1994). However, it was a system of symbols initially designed for priests to keep financial records. The alphabet did not represent sound. The first pictograms developed into a stylized version representing an idea; a later, more abstract version represented phonetic sounds (Lockard, 2015).

The Phoenician alphabet on which our present literacy system is based was developed around 1000 B.C. Writing also began to standardize the left-to-right orientation and stylized linear characters (Healey, 1990). The alphabet originally only had consonants and later added periods to separate words (Rodgers, 2004). The Phoenicians produced a literacy based in meaning rather than sound (Rodgers, 2004). With the addition of vowels in Greece about 200 years later, a sound-based system was instituted.

Early writing used wet clay tablets that were baked or dried. Additional writing materials included plain stones, cushions, bronze, zinc, copper, silver, or gold (Atilgan, 2006). Furthermore, some writing materials were made of organic substances like plant roots and leaves or flax seeds. Tablets were made from ivory or from wood covered with wax (Atilgan, 2006). However, the most important material was papyrus. The Egyptians began using the material in the 3300s BC, and papyrus was in continuous use until the 11th century (Atilgan, 2006).
Rolls and manuscripts. The use of papyrus rolls began by 6000 B.C. and continued through 400 A.D., when codices supplant ed rolls in countries that embraced Christianity (N. L., 1999). The codices were initially made of papyrus and later parchment (Bruckner, 2003). A codex, similar to a book, has a cover and pages bound to one side. The codices were hand written and could have drawings and/or ornate pictures. Codex was a Latin word which came from the term for a tree’s trunk, caudex, because wooden panels were used in early writing (N. L., 1999).

Latin became the spoken language of the known Western world through the Roman Empire (27 B.C.-476 A.D.). It is an Indo-European language, over 2,500 years old, with ties to over 80 languages, both ancient and modern, including ones in Europe, India, Central Asia, and Iran (Clackson & Horrocks, 2011; Janson, 2004). Even after the fall of Rome, Latin was the read, spoken, and written language of educated people in Western Europe for a thousand years (Janson, 2004). However, there were no incidents of reading problems cited. The absence of reading disabilities could be a lack of documentation or the training of only gifted students. In a society with an approximately 14% literacy rate, students who struggled with reading did not pass through the available levels of education (Grendler, 2010). Moreover, codices were expensive and time consuming to produce, so the availability of reading material was limited. That availability and the literacy needs of the population changed with the invention of the printing press.

Printed works. While estimates of the date of the invention of the printing press by Johannes Gutenberg vary over several years (1436-1440), its effect on civilization was profound. The printing press has been called the “sine qua non (without which [there is] nothing) of general
literacy, the fuse that lit the Protestant Reformation, the Enlightenment, and our modern, secular world” (Epstein, 2008, p. 8).

The Reformation brought a mandate of universal literacy to facilitate the assimilation of biblical knowledge in the population. Martin Luther posited the use of the vernacular over Latin for the general population, and the printing press made possible printing in every written tongue (Gutek, 2010; Stock, 2008). However, this change affected more than religious thought and knowledge. Fischer (2005) stated, “In 1450, only one printing press was operating in all of Europe. By 1500, around 1,700 presses in over 250 centres [sic] had already published about 27,000 known titles in more than ten million copies” (p. 207). The church and the clergy were not the only domain for knowledge (Lyons, 2010). The push for literacy and the availability of reading materials increased Europe’s literacy from several thousand to several hundred thousand in less than 50 years (Fischer, 2005). By the end of the 15th century, the book and reading had become the chief means of obtaining knowledge; consequently, the ability to read became more essential in society (Fischer, 2005).

Mothers first taught literacy in England and later America by mothers employing hornbooks as curriculum (Monaghan & Berry, 1999). Hornbooks were named for a thin layer of cow horn placed over the text to protect it from day-to-day life (Heilman, Blair, & Rupley, 2002). The small paddle-shaped boards commonly had the alphabet, vowel and consonant combinations, and religious works including the Lord’s Prayer (Austin, n. d.). In 1545, Latin replaced English as the main language, and a spelling book by Coote, published in 1596, dominated for 100 years (Rodgers, 2004). The English hornbook contained the alphabet, a shortened syllabary, an invocation, and the Lord’s Prayer.
Dame schools frequently served as the next step in instruction. Dame schools opened as early as the 1660s in America and women, who had more academic qualifications than other members of the community, served as teachers (Parkerson & Parkerson, 2001). The women teaching received their pay either privately or through the community. The dame school was the forerunner of the public primary school (Parkerson & Parkerson, 2001).

The hornbook expanded into the battledores with a more secular content (Monaghan & Berry, 1999). Battledores were thick paper cards of about 13x20 cm folded into three sections (Hornbooks and Battledores, 2001). Because of the larger amount of space, more reading materials were included, and they had illustrations and could be in color (Anonymous, 1990). Primers and spellers followed the battledores.

The first primer for American children was printed in 1727 and called *The New England Primer* (Martinez & McGee, 2000). A surge in nationalism resulted in Noah Webster’s dictionary with spellings unique to American readers. The dictionary was based on a synthetic syllabary (Brown, 2011). Other books like the *McGuffy Readers* (1836-on) became an integral part of literacy education in America. The *McGuffy Readers* emphasized phonics and sight words (Vogt & Shearer, 2010).

Over the next hundred years, various methods of teaching were introduced, including readers with elocution methods. Elocution was the formal teaching of speech and included syntax, articulation, manner, and tone (Howe, 2011). Memorization was a strong part of learning, and the ability to speak well was important. Furthermore, word-to-letter, sentence method, story method, sound-to-letter, invented alphabets, diacritical markings on alphabets, and synthetic phonics were used (Monaghan & Berry, 1999). In the 1890s, Charles W. Elliot, president of Harvard, waged a successful campaign to increase the quality of materials in the
classroom. Elliot called for the removal and replacement of readers with actual literature (Monaghan & Berry, 1999). The textbooks began to reflect fairy tales, fables, and myths at the lower grades and a higher level of literature for upper grades (Monaghan & Berry, 1999).

One of the first books on teaching the discipline of reading was *Reading Without Tears: A Pleasant Mode of Learning to Read* by Favell Lee Mortimer (Vogt & Shearer, 2010). While there is no publication date, the inscription on the book stated the year as 1867 (Vogt & Shearer, 2010). The study of the pedagogy of reading continued with the highly influential book by Edmund Burke Huey, *The Psychology and Pedagogy of Reading* (1908). Huey’s book stressed reading comprehension. By the second decade of the 20th century, scientific research began on the process of reading and its instruction. Edward L. Thorndike and Leta Hollingworth were the first psychologists to study reading problems in the early 20th century (Schreiner & Tanner, 1976; Sears, n. d.). By the 1930s, reading became a separate discipline from general teaching. Reading became the focus of written materials and courses in colleges and universities. Emmett A. Betts’s *The Prevention and Correction of Reading Difficulties* (1936) became a classic text that emphasized the factors that cause reading problems, correction and prevention, reading clinics, simple assessments, and reading programs (Monaghan & Berry, 1999).

Arguably the most influential book on reading and its acquisition was *Why Johnny Can’t Read* by Rudolf Flesch (1955). Flesch recommended a reading course emphasizing phonics. The interest in problems occurring in students’ learning to read led to the pivotal First Grade Study and Chall’s *Learning to Read: The Great Debate*, both published in 1967. The data established the ineffectiveness of then-current reading curriculum and promoted phonics, enduring themes in the reading materials, and the promotion and ease of access to reading research.
While begun in the late 1960s as a grassroots program, schools implemented the whole-language philosophy of reading in the 1990s (Taylor, 2007). Whole-language is a reading method that works from the top down versus the phonics method, which works from the bottom up. Whole-language methodology includes “authenticity, inquiry and negotiation-based curriculum, holistic perspective, alternative assessment, social perspective, and multicultural education” (Schwarzer, Petrón, & Luke, 2011, p. 149). The “The Reading Wars” is the scholarly debate between whole-language supporters and phonics supporters (Kim, 2008). However, since 2003, the course of teaching reading has been driven by the No Child Left Behind Act (NCLB). NCLB mandated the utilization of research-based methods in curriculum selection (No Child Left Behind, 2003). *Put Reading First* (Armbruster, Lehr, & Osborn, 2003) codified the importance of phonemic awareness, phonics, vocabulary, fluency, and comprehension. In addition, the Center for the Improvement of Early Reading Achievement (CIERA, 2006) noted 10 research-based principles: (a) The importance of early literacy experiences in the home, (b) quality preschool programs for children in need, (c) promotion of alphabet and phonemic awareness, (d) primary curriculum that contains recommended research techniques, (e) primary classrooms that reflect a positive reading environment, (f) inclusion of cultural and linguistic diversity, (g) children with reading disabilities being identified and given one-on-one or small group quality tutoring, (h) the necessity of good reading by third grade, (i) professional growth opportunities for education professionals, and (j) whole school communities committed to promotion of good reading skills in every discipline (para. 1-10).

**Computer or the digital era.** Books have again changed in their availability and expense. With the advent of the Worldwide Web in 1991, access to a myriad of sources continues to increase. Epstein (2008) asserted, “The new technologies of digitization and the
Internet foreshadow a time when every book ever printed in whatever language it happens to reside, will be permanently and cheaply available” (p. 9). Students need not only book literacy, but also digital literacy with critical thinking skills to insure pupils in our culture can function as lifelong learners to face the demands of a world that does not yet exist.

The demands of digital literacy are reflected in how students are taught to read. The International Literacy Association (ILA), formerly the International Reading Association (IRA) and the largest reading teacher organization, currently recommends a balanced-literacy approach that incorporates authentic text with skills instruction (IRA, 1999). This multi-method approach is recommended because each student is an individual.

There is no single method or single combination of methods that can successfully teach all children to read. Therefore, teachers must have a strong knowledge of multiple methods for teaching reading and a strong knowledge of the children in their care so they can create the appropriate balance of methods needed for the children they teach. (IRA, 1999, p.2)

How children are taught to read and the challenges that some students face remain a topic of continued research.

**Early Literacy**

Likewise, the importance of early literacy skills is supported by numerous studies (Armbruster et al., 2003; Bond & Dykstra, 1997; Early Childhood Longitudinal Study [ECLS], n.d.; Foster & Miller, 2007; Morrow & Dougherty, 2011; Paciga et al., 2011). Scholars note that children, who have strong early literacy skills, including phonemic awareness, not only do better in kindergarten, but continue to do better in school, with higher graduation rates. Students identified as struggling readers early in the literacy acquisition process and are given remedial
help show strong improvement in literacy skills (Foster & Miller, 2007). However, students, who are identified at third grade or later, do not reach grade level; moreover, the reading gap broadens over time. Only 13% of remediation methods are successful for students after fourth grade (Foster & Miller, 2007). The continued and deepening divide between good readers and bad readers has been termed the “Matthew” effect. In essence, the “rich get richer–poor get poorer.”

Conversely, the most successful literacy programs combine child-centered ideas with skill-based models (Morrow & Dougherty, 2011). These programs take a whole-child approach that acknowledges the physical, emotional, and intellectual viewpoint and note the differences in learning styles. Furthermore, literacy practices that include authentic play demonstrate significant effect in learning. Brain-friendly environments designed to promote positive neurotransmitters combine affirmative mood and emotion with empathy between the child and teacher (Paciga et al., 2011; Rushton, Juola-Rushton, & Larkin, 2010). For example, children who succeed in literacy are able to pass RAN assessments; however, drilling on the numbers, colors, and letters does not have the effect of an authentic learning experience with the items (Rushton et al., 2010). Active learning develops higher thinking skills, which develop in the pre-frontal cortex of the brain. However, not all children’s brains make the literacy connection.

**Reading Disabilities**

About one third of fourth graders and one fourth of eighth graders do not read at a basic level (Spencer, Quinn, & Wagner, 2014). A basic level is defined as “partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at each grade” (NCES, 2011, p. 6). When good readers encounter a word with which they are unfamiliar, they use three main resources for decoding: meaning, language structure, and visual clues.
Poor readers struggle for many reasons, including inadequate retention of curriculum, sparse scaffolding, and disabilities.

**Types of reading disabilities.** While reading disabilities vary and demonstrate different characteristics, most fall under five categories: dyslexia, dysgraphia, dysphasia, auditory processing disorder, and visual processing disorder (Kemp, Smith, & Segal, 2013). Reading disabilities can be in combination with other disabilities, both learning and physical. A total of 55% of children with a reading disability have also been identified with speech-language impairment (Foster & Miller, 2007). This factor makes early identification of speech problems a critical step in pre-literacy skills.

Students with dyslexia typically have difficulty with left-to-right motion and differentiation between rapid pitch/speech (Lawton, 2011). The International Dyslexia Association defined dyslexia as “characterized as difficulties with accurate and /or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language . . .” (International Dyslexia Association [IDA], 2002). There are three types of dyslexia: “dysphonetic (unable to integrate symbols with their sounds), dyseidetic (unable to perceive letters and whole words as configurations or gestalts), or a combination of both” (Boder, 1973, p. 663). Studies using functional magnetic resonance imaging (fMRI) have shown children with dyslexia demonstrate problems processing speech or non-speech information in the left hemisphere of the brain (Forgeard et al., 2008). One theory is that immature magnocellular neurons may be responsible for the disability. Additionally, rapid timing skills are a noted problem in people with dyslexia (Forgeard et al., 2008; Kujala et al., 2001; Lawton, 2011; Magnan, Ecalle, Veuillet, & Collet, 2004; Overy et al., 2003).
Older readers with reading disabilities or problems. The research on older students with reading disabilities is limited. Because early intervention has been proven crucial to reading success (Armbruster et al. 2003; ECLS, n.d.; Foster & Miller, 2007; Morrow & Dougherty, 2011; Paciga et al., 2011), research on older students has been limited. The assumption that early reading interventions are successful for younger students has not been proven in the older student population (Edmonds et al., 2009; Flynn, Zheng, & Swanson, 2012; Vaughn et al., 2012). While reading scores for nine-year-olds showed improvement, scores in reading from 1971-2004 did not improve for 13 and 17-year-olds (Edmonds et al., 2009). The data indicate that the reading needs of this population are not being met.

Flynn, Zheng, and Swanson’s (2012) meta-analysis of students with reading disabilities in grades five through nine included pretest and posttest with norm referenced data. The ten qualified studies were consistent with other studies of this population (Edmonds et al., 2009; Vaughn et al., 2012). The effect of the studies was small to medium. Flynn et al. (2012) stated, “The results of this synthesis clearly indicate that strategies effectively used to improve reading for students in the lower elementary grades are not meeting the same level of success with students in the upper elementary and middle school grades” (pp. 29-30). Edmonds et al. (2009) found that even with targeted reading comprehension, multiple reading and word reading components or strategies, the student with a reading disability improved an average of a half-standard deviation when compared to non-treatment peers with a disability. Moreover, a three-year intensive intervention with sixth-eighth-grade students showed no improvement in students with disabilities as compared to their non-disabled peers. The intervention allowed students to progress, but they did not make gains in percentile (Vaughn et al., 2012). While interventions, even with small to moderate success should continue, reaching students with a disability early
has the greatest probability of success (Armbruster et al. 2003; ECLS, n.d.; Foster & Miller, 2007; Morrow & Dougherty, 2011; Paciga et al., 2011).

Upper elementary students with reading disabilities. Upper elementary grades (4-5) have had little concentrated research. Research-based techniques have been taken from other levels, whether from lower-grade or upper-grade methodology. However, the literacy needs of upper elementary are targeted more toward older students literacy needs than early elementary students (Wanzek, Wexler, Vaughn, & Ciullo, 2010). Still, the needs of fourth and fifth graders are unique in the education system. Whereas up to the third grade, students are learning to read, after third grade students are expected to read to learn (Kent & Wanzek, 2012). While problems present in fourth and fifth grade cannot be prevented, active and intensive intervention can help students not fall further behind and develop as readers (Kent & Wanzek, 2012). The “fourth-grade slump” represents children who have done well in school, and then the literacy demands of fourth grade reflect weaknesses in their comprehension and word processing (Reed & Vaughn, 2012). Although fourth graders with reading challenges may not have a reading disability, an estimated 41%-47% of students are identified with a learning disability late or the disability appeared late (Reed & Vaughn, 2012). Additionally, students, who develop problems learning in elementary, are statistically at risk for continued challenges and dropping out of school (Wanzek et al., 2010).

Young children with reading disabilities. There is universal acceptance of the benefits of early identification of children at risk of disabilities or children with disabilities (Al Otaiba & Fuchs, 2002; Armbruster et al. 2003; ECLS, n.d.; Foster & Miller, 2007; Morrow & Dougherty, 2011; Paciga et al., 2011; Reynolds, Whedall, & Madelaine, 2010; Wanzek & Vaughn, 2007). The earliest interventions (K-1st) with smaller group size show the strongest effect (Reynolds et
al., 2010; Wanzek & Vaughn, 2007). However, there is a difference between “instructionally”
disabled and “difficult-to-remEDIATE” (Al Otaiba & Fuchs, 2002; Wanzek & Vaughn, 2007). It is
the readers that continue in the lowest 30th percentile even after interventions that show the
greatest problems. The majority of children with reading disabilities demonstrate major
shortfalls in phonological processing. Moreover, deficits are noted in naming-speed,
comprehension, and speech timing or language impairments (Al Otaiba & Fuchs, 2002; Smith,
Smith, Locke, & Bennett, 2008). Reading problems continue to increase as the demands of
school literacy accelerate. Furthermore, the success of reading intervention lessens each year in
school (Wanzek & Vaughn, 2007). For example, interventions are more successful in first grade
than those implemented in second or third grade. Additionally, children’s positive interaction
with school is a proven factor in academic success (Eklund, Torppa, & Lyytinen, 2013).
Therefore the most successful interventions are performed early, emphasize phonological
processing, and are engaging to the students.

Successful Literacy Interventions

In contrast to students with disabilities, successful readers find ways to apply their
knowledge in interpreting the text placed in front of them. The standard reading criteria of
phonemic awareness, phonics, vocabulary, fluency, and comprehension are considered research-
based curriculum and are generally successful with normally progressing students; however,
studies formulated to focus on students with learning disabilities and the effect of the five tenets
of reading are limited (Chard, Ketterlin-Geller, Baker, Doabler, & Apichatabutra, 2009). For
example, repeated reading for fluency is standard in classroom practice; nonetheless, no studies
from 1975-2006 met the requirements of quality research as established by Horner et al. (2005)
and Gersten et al. (2005) (Chard et al., 2009). While repeated reading seems a logical activity, further research is needed for its applicability to students with learning disabilities.

Research consistently supports the importance of establishing the main idea of the passage for reading comprehension, no matter the age level (Al Otaiba & Fuchs, 2002; Flynn et al., 2012; Miller, Darch, Flores, Shippen, & Hinton, 2011; Reynolds et al., 2010; Wanzek & Vaughn, 2007; Wanzek et al., 2010). Additionally the inclusion of background knowledge and metacognitive skills further aids reading comprehension. Without these abilities, poor readers continue to flounder. However, explicit instruction in rule-based statements and a multi-step procedure for finding the main idea have yielded substantial data. The students with disabilities performed better than their peers in tests, comprehension skills, and weekly story retells (Miller et al., 2011).

Reading Success is a literacy program that has been in use since 1978. The curriculum emphasizes teacher/tutor-guided reading that strives for mastery reading. Data from this program show monthly increases of 0.03-6.80 per month in reading (Idol, 2010). The significant gains were achieved through highlighting research-based reading practices, including critical reading behaviors, word reading accuracy, reading speed, reading comprehension, written language, and mechanical skills (Idol, 2010). However, certain students benefited more from the program. At-risk students scored higher than students in special education; those with milder learning disabilities performed better than students with mild retardation or behavioral problems (Idol, 2010). The program requires training for teachers/tutors, appropriate curriculum, and daily data gathering.

Reynolds, Whedall, and Madelaine (2010) surveyed successful interventions for young readers. They concluded the most effective programs gave attention to the following 10 tenets:
(a) early identification and intervention, (b) small group settings, (c) inclusion of the five core components of research-based curriculum (phonemic awareness, phonics, vocabulary, fluency, and reading comprehension), (d) phonemic awareness using blending when students are familiar with at least some of the sounds, (e) synthetic phonics approach of teaching letter sounds into words, (f) emphasis on automaticity in word recognition, (g) employment of explicit and systematic instruction, (h) interventions that are frequent and last at least 20-30 minutes, (i) well-trained instructors, (j) assessment process used to identify children and examine progress (Reynolds et al., 2010).

Diverse methods and programs are used to facilitate the learning of literacy, with varied degrees of success. This can be due to the instructor, the curriculum, or the multi-faceted needs of students. However, as successful as many of the above programs can be with students, some students either need more help or do not succeed. Other more novel approaches could be more successful. Music has proven to be one of those methods (Bolduc, 2008; Bond, 2012; Darrow et al., 2009; Hille et al., 2011; Moreno et al., 2011; Overy et al., 2003; Standley, 2008).

**Early Elementary Readers**

Although first noted over 30 years ago, the importance of literacy skills by third-grade is increasingly evident (Lloyd, 1978). The Early Childhood Longitudinal Study (ECLS) was co-developed by the National Center for Educational Statistics and the U.S. Department of Education (NCES, n. d.). The study tracks over 12,000 children, kindergarten through third grade. The ECLS is a multilevel sampling system in a nationally representative sample. The study demonstrates that overlapping stages of literacy development can be strengthened; however, students who were behind in the beginning stayed behind in overall literacy skills (Foster & Miller, 2007). The statistics for children who do not read by third grade are
significant. Students that do not read on grade level by third grade have a 99% chance of never reaching grade-level reading. They are also the children who will likely drop out of school without completing high school (Hernandez, 2012; Morrow & Dougherty, 2011). Additionally, many states are now requiring a passing grade on a high-stakes literacy test as a precursor to advancement to fourth grade.

Third grade is considered a “pivot point” in literacy education. In third grade “students shift from learning to read and begin reading to learn” (Hernandez, 2012, p. 5). K-2 curriculum concentrates on teaching literacy skills; third-grade curriculum starts to demand synthesis of knowledge through text-explicit, text-implicit, and script-implicit questions. Therefore, a student must learn the basics of reading skills before the critical third grade. One-third of students are not reading at a proficient level in third grade; however, their high school graduation rates differ along economic and racial lines. For example, 16% of non-proficient third-grade readers do not graduate from college. If the student lived even a year in poverty, the non-graduation rate rises to 25%, and for those students in poor neighborhoods, the mom-graduation rate is 35% (Anne E. Casey Foundation, 2010; Hernandez, 2012).

Early intervention is crucial for students who are struggling with the reading process. This is clearly reflected in the allotment of federal resources. The Reading First Program was a product of the National Reading Panel and focused on using scientifically research-proven reading methodology in teaching students’ literacy with the stated goal of reading well by the end of the third grade (National Institute of Child Health and Human Development, 2000; United States Department of Education [USDOE], 2006).

Congress established the National Reading Panel in 1997 to review and collate scientific evidence for best-practice literacy instruction. The study found that systematic phonics proved
effective in teaching reading. However, the research also showed this method was ineffective after first grade. “Among the older students in 2nd through 6th grades . . . phonics instruction was not effective for teaching spelling (d = 0.09) or teaching reading comprehension (d = 0.12)” (National Reading Panel, 2000, p. 418). Because the Reading First program has funded only programs with strongly systematic phonics, balanced literacy programs have suffered. This effect is particularly compounded in schools with greater reliance upon federal funding for programs (Cummins, 2007). Balanced literacy programs are the most effective and responsive to students’ individual needs (IRA, 1999).

In addition, student engagement in the classroom is one of the most important elements in successful learning. Guo, Connor, Tompkins, and Morrison (2011) examined longitudinal reading data on 1,364 third graders, utilizing their attention to task and their self-reliance as indicators of engagement. Guo et al. (2011) found three main qualities: the interaction between the teacher and student, quality of the classroom (in this case teacher-child interactions), and engaged learning by the students. The study confirmed that an engaged learner was critical to reading success, and this engagement was over time in the classroom from first grade onward (Guo et al., 2011). Furthermore, students who participate in high-interest activities have longer attention spans and retain more information (Cummins, 2007; Darrow et al., 2009; Geist & Geist, 2012; Salmon, 2010; Standley, 2008; Taylor & Parsons, 2011; Wells & Sheehy, 2013).

**Music**

The first use of music to aid in learning would be impossible to date. Gardner (1983, 2006) posits music as the first intelligence to develop. Cultures have been setting work to music for centuries. The rhythm helps set a needed beat for work, builds affirmation and control, and helps pass the time (Gioia, 2006). Some songs handed down from the Middle Ages address
various forms of learning, especially for children. Most students learn their ABCs through the use of music. Music can be called the universal language and has the potential to activate previous knowledge for scaffolding and enhance literacy instruction (Salmon, 2010). The emotions evoked by music seem to be universal, as suggested by the study by Sievers, Polansky, Casey, and Wheatley (2013). The emotions cited as conjured or evoked were the same whether in a college student in the United States or someone in a culturally isolated tribal village in Cambodia (Sievers, Polansky, Casey, & Wheatley, 2013).

The overstressing of systematic phonics instruction can have a negative effect on literacy skills. Repeated research has shown the importance of engaged learners in the education process (Darrow et al., 2009; Geist & Geist, 2012; Salmon, 2010; Standley, 2008; Taylor & Parsons, 2011; Wells & Sheehy, 2013). According to Salmon (2010), “Music is a language of learning that eventually involves children in talking, reading, drawing, and writing” (p. 937).

Children with learning disabilities not otherwise specified (LD-NOS) have shown less attention to events both internal and external, problems with engagement of working memory, and difficulties with encoding and retrieving memory (Fernandez, Harmony, Mendoza, Lopez-Alanis, Marroquin, Otero, & Ricardo-Garcell, 2012; Posner & Patoine, 2009). Music triggers a response in the brain that aids in retention and learning. Additionally, music affects mood and can enhance memory (Foran, 2009; Salmon, 2009). How music works on the brain is becoming increasingly clear through the use of technology in electroencephalogram (EEG), magnetoencephalography (MEG), diffusion tensor imaging (DTI), magnetic resonance imaging (MRI), functional magnetic resonance imaging (fMRI), and neuroimaging. Brain-scanning devices are used to discover how the brain functions in learning interactions including blood flow to parts of the brain.
Perhaps the strongest support for music as a method to teach literacy is the fact that both are processed in the same location in the brain (Strait et al., 2011). It is theorized that strengthening one discipline with stimuli will strengthen the other discipline (Habib & Besson, 2009; Hyde et al., 2009; Kujala et al., 2001; Moreno et al., 2009; Oechslin et al., 2013; Trainor, 2012; Wandell et al., 2008; Watanabe et al., 2007). The brain thrives on patterns, making it true that “repetition aids learning.” The problem comes when the pattern is weak or scattered. With students at risk, it is essential to ground information in a myriad of ways. Whether labeled as learning styles or Gardner’s Multiple Intelligences, various methods of reviewing similar material enable the brain to function better (Ciecierski & Bintz, 2012). Tankersley (2005) stated the brain seeks to create patterns and tie new learning to previously learned knowledge and personal experiences. Good teaching makes use of this ability by connecting knowledge together so that students can better process and retain the information. Multiple connections ground the information in the brain and yield the strongest avenue for accessing and using information.

Additionally, music has been used for both mental and physical therapy since World War II (Cassileth, 2009; Rickson & McFerran, 2007). This discipline differs from typical music instruction in its purpose. Rickson and McFerran (2007) noted, “Music therapy in special education differs from music teaching in its emphasis of non-musical skills, using music as a symbol of emotional and personal growth rather than as a cognitive skill-set to be learned and practiced” (p. 40). Music therapy grew out of the needs of returning veterans from World War II. Music is an effective tool for healing, and the principles expand into the larger at-need population.

Teaching music to aid literacy. There is significant research that music aids in the teaching of literacy skills. Bolduc (2008) examined 13 studies on music education and emergent
literacy. The studies demonstrated a correlation between music and early literacy skills in children with and without disabilities. The combined researchers agree that music builds linguistic abilities in the areas of phonological memory, auditory perceptions, and metacognitive knowledge (Bolduc, 2008). Bolduc theorized that music stimulated the phonological memory and aided in linguistic memory transfer.

Bond (2012) produced a literature review of 38 articles written between 2005 and 2010. Of those, 37 articles supported music as helpful in learning literacy skills. Music “promote(s) the development of three important components that are equally involved in the development of linguistic abilities: auditory perception, phonological memory, and metacognitive knowledge” (Bond, 2012, p. 35). Standley (2008) noted the effectiveness of music in teaching literacy, but intervention was most successful when coupled with general music rather than replacing it. The two together prompted growth even if the intervention was limited in scope. However, “this existing body of research does not include studies with juxtaposition of aural skills and visual decoding tasks, effect on reading per se remains unclear” (Standley, 2008, p. 30). Study is needed to further test the effect of hearing music, the ability to read music, and literacy skills.

Standley (2008) produced a meta-analysis of 30 studies which employed musical intervention to assist in literacy skills. There was a strong, significant, overall effect size of $d = .32$. However, the number increased to $d = .44$ when the activities were matched to specific needs or used to reinforce reading behavior ($d = .66$). In these studies, the length of time of the intervention, daily, short-term, intense, weekly, or throughout the school year, had little effect on the positive results of the data (Standley, 2008).

**Reading curricula designed to emphasize music.** Curricula have been developed around using music as a medium for learning. *Earobics* is a program found to have positive
effects on literacy in Alphabets (+25 percentile points) and Reading Fluency (+15 percentile points) (USDOE, 2009). The program has been used effectively with general education students, at-risk learners, students with disabilities, English language learners, and in older struggling readers. It uses music, audiocassettes, videotapes, picture/word cards, letter-sound decks, big books, little books, and leveled readers. The software adjusts to the needs of the students and has 5 games on 600 levels. Importantly, it meets the criteria for researched-based curriculum in schools with a need for literacy interventions.

Conversely, Darrow et al. (2009) implemented the Register Music/Reading Curriculum in five different settings in 485 second-grade students. The data collected focused on word decoding, vocabulary, and reading comprehension. The students made significant gains between the pre-test and the post-test; however, the Gates-MacGinitie Reading Test (GMRT) subtests did not show improvement in the 7-8 week study. While success was limited in the norm-referenced assessment, limitations in the study were noted. The short time span could have been a contributing factor; additionally, the significant progress between the pre-test and post-test was nullified by the researchers’ concern for repeated test administration. Nevertheless, students did show improvement, and the teachers and students were positive toward the curriculum (Darrow et al., 2009).

**Music and specific literacy skills.** Pre-literacy skills are paramount to literacy success, and the effects negatively and positively compound over time (Foster & Miller, 2007; Morrow & Dougherty, 2011). The use of music in literacy instruction indicates “a causal association between music training, phonological awareness, and reading ability” (Moreno et al., 2011, p. 167). Lucas and Gromko (2007) tested whether students with better tonal awareness would score significantly higher in phonological testing. The results suggested a connection between
music pattern discrimination and phoneme segmentation as these both rely on aural perceptions ability. The stimulation of tonal and rhythmic perceptions in kindergarteners produced significant results in phonological awareness (Bolduc, 2009). The increased time of exposure to music heightened the results (Corrigall & Trainor, 2011).

Furthermore, Lucas and Gromko (2007) stated the implication for educators is that sound to symbol mapping skills and musical pattern discrimination can enhance children’s developing phonemic awareness. If one accepts reading has a solid aural element then music instruction may help students hear sounds that distinguish both musical patterns and words (Lucas & Gromko, 2007).

Music aids in the retention of spelling, vocabulary, verbal sequencing, and reading composition (Hille et al., 2011; Kouri & Telander, 2008; Piro & Ortiz, 2009; Rickard et al., 2010). Music does not “fix” all reading problems; however, it appears to aid in specific skills and to be a general indicator of problem areas or successful students. If young students are having problems with tonal and rhythmic reproduction, noting their pre-literacy skills would be prudent. Rickard, Vasquez, Murphy, Gill, and Toukhsati (2010) noted that “the current findings provide strong evidence that music training may be an effective means of facilitating literacy training in primary school aged children” (p. 45). Music has been shown to directly affect the brain and reading abilities (Habib & Besson, 2009; Hyde et al., 2009; Moreno et al., 2009; Oechslin et al., 2013; Posner & Patoine, 2009; Trainor, 2012; Wandell et al., 2008).

**Brain activity in literacy and music instruction.** The role of the brain in learning to read is essential to understanding the best ways to teach students. Good and poor readers differ in various areas of the brain (Ben-Shachar, Dougherty, & Wandell, 2007; Dougherty et al., 2007; Fernández et al., 2012; Habib & Besson, 2009; Huss et al., 2011; Hyde et al., 2009; Lawton,
2011; Moreno et al., 2009; Strait et al., 2011; Trainor, 2012; Wandell et al., 2008; Wandell & Yeatman, 2013). The question is whether these differences in the brain are inborn, environmental, or a combination of both.

**White matter in the brain as related to literacy.** In 1892, Jules Joseph Dejerine first wrote about the process observed in the brain and reading (Bassetti & Jagella, 2006; Joseph Jules Dejerine, 1969). Dejerine’s general reading pathways in the brain are similar to the modern tracking with complex scans (Ben-Shachar et al., 2007). The reading process is spread throughout the brain itself. While reading requires processing in gray-matter areas of the brain, it is the white matter that is the connector (Ben-Shachar et al., 2007). Disrupted white-matter transmission results in reading problems. Examples include split brain patients (corpus callosum between the right and left hemisphere of the brain does not function to some degree) and some multiple sclerosis patients.

Instrumentation and algorithms can measure white matter connections. Magnetic resonance imaging (MRI) measures the apparent diffusion coefficients (ADC) of water in the brain (Ben-Shachar et al., 2007). Diffusion-weighted MRIs with tractography algorithms demonstrate the pathways of white matter in the living human brain. Good readers and poor readers differ in the effectiveness of water diffusion in white matter (Wandell & Yeatman, 2013). A three-year longitudinal study of students 7-12 years old noted the correlation of diffusion changes in the inferior longitudinal fasciculus (ILF) and reading proficiency (Wandell & Yeatman, 2013). The diffusions occur in three main large areas: the posterior corpus callosum, the arcuate fasciculus, and the ILF (Wandell & Yeatman, 2013). Fractional anisotropy (FA) in the posterior callosum resulted in a negative correlation in poor readers and dyslexic adults, and the arcuate fasciculus showed differences in phonological awareness between good and poor
readers. The diffusion changes were supported by studies on stroke victims with lesions in the arcuate fasciculus vicinity that gave similar problems with phonological skills (Wandell & Yeatman, 2013). Finally, the ILF has been associated with visual functions. Lesions in this area denote patients with reading problems. An example was an epileptic patient with reduced reading abilities that occurred with the advent of lesions (Wandell & Yeatman, 2013).

Analysis of how the brain processes reading is complex and still evolving. Examination of poor readers versus typical readers shows differences at both a microstructural and macrostructural level (Frye et al., 2011). Frye et al. (2011) compared 10 poor readers with 20 typical readers. The participants ranged in age from 16 to 33. The study measured macroscopic volume (white matter) and three microstructural indicators: axial, radial, and mean diffusivity (Frye et al., 2011). Additionally, the study applied two variables: childhood history of poor reading and present reading abilities. Students who have reading interventions may develop compensatory pathways along with traditional reading pathways with improvement in reading skills. The pathways can develop in opposite directions on a microstructural and macrostructural level when comparing historically poor readers and their present reading levels to typical readers (Frye et al., 2011).

Nonetheless, neurobiological differences between good and poor readers change little with time and reading instruction. However, “myelination and pruning are plastic and can be modified by experience and the rates of these processes vary between children” (Wandell & Yeatman, 2013, p. 264). It is important that axons are developed so that pruning from underuse is slowed and experiences to develop connections in the brain are accentuated.

In noting the solid and growing evidence of brain mapping and reading, Wandell and Yeatman (2011) posited the idea that each child with a reading problem be given an hour of
brain scans at a cost of around $2,000. The scans would establish any areas of concern and develop the best individualized plan for each student. The results of the scans could be used to create effective curriculum intervention.

_Music instruction effects on the brain._ Music and its interaction with the brain is a topic of interest for researchers in a variety of disciplines. Music in education is stated to maintain motivation, develop concentration, support geometry proficiency, enhance spatial abilities, strengthen melodic processes, produce a stronger memory expertise, aid in learning a new language, improve long-term memory, and have a correlation with reading fluency (Cole, 2011; Slater, Tierney, & Kraus, 2013).

Neuroscientists and neurologists began studying the brains of musicians 35 years ago (Habib & Besson, 2009). Musicians are of interest because they have practiced a certain discipline for a number of years (Moritz, Yampolsky, Papadelis, Thomson, & Wolf, 2013; Skoe & Kraus; 2012; Watanabe et al., 2007). This affects the connections in the brain and how certain sections grow. For example, the central sulcus can predict what kind of instrument a person has played. The middle part of the sulcus looks similar to an omega-like curvature; this is more symmetrical in keyboard players, who use both hands, than in string players (Habib & Besson, 2009).

The ability to physically see how the brain functions in music and literacy environments is a recent accomplishment. Both utilize the aural part of the brain. Brain imaging, electroencephalography, magnetoencephalography, positron emission tomography, intrauterine photography, and functional magnetic resonance imaging literally show the brain “light up” with songs and stories (Cooper, 2010; Hansen & Milligan, 2012). Sensitivity to sound is one of the hallmarks of both musical literacy and reading literacy. Musical training enlarges the areas of
the brain employed in literacy. Playing a musical instrument utilizes cross-hemisphere interaction, thus building the strong pathways in the brain (Foran, 2009; Hansen & Milligan, 2012). Kindergarteners who had four months of musical training were found to be significantly higher in phonemic-segmentation fluency than children who did not receive the musical training (Gromko, 2005).

Wandell et al. (2008) performed a longitudinal study on 49 children aged 7-12 to study how arts education correlated with improvement in literacy skills. The 3-year study developed a new computer program using diffusion tensor imaging (DTI) to map the connections in the brain, especially the corpus callosum. This area connects the right and left hemispheres of the brain. The corpus callosum consists of over 300 million axons in fiber bundles connecting the zones in the brain. The DTI imagining allowed the researchers to measure the development of the brain’s white matter. The white-matter pathways develop dramatically between the ages of seven and the teenage period. The imaging demonstrated significant differences between strong and weak readers in the posterior segment of the corpus callosum. The major discovery of the study was the effect of musical training in the first year and its effect on fluency in reading. Students with the strongest musical instruction in the first year did significantly better than non-musical students over the 3-year period. Visual arts participation also correlated significantly with phonological awareness. However, the study noted that the children might be more disposed to learning than a typical child and stated the need for further research with children of diverse reading abilities.

The study by Hyde et al. (2009) answered the above question of predisposition of children to be musicians and, therefore, better readers. While natural ability exists, plasticity in the brain is developable. Using deformation-based morphology (DBM), Hyde et al. (2009) did
“the first longitudinal investigation to directly correlate brain structure and behavioral changes over time in the developing brain” (p. 3022). The participants were selected from Boston public schools and had no musical training. The participant group and control group were matched on various levels including IQ, SES, and baseline DBM. The participants demonstrated greater improvement in melodic and rhythmic discrimination and motor ability in finger agility. They did not show advancement over the control group in visual-spatial and verbal transfer domain as previous studies have demonstrated. However, the length of the study, the intensity of practice, and the need for a larger sample could be contributing variables (Hyde et al., 2009).

Additionally, unexpected significant changes occurred in “various frontal areas, the left posterior percingulate, and a left middle occipital region” (p. 3023). One of these areas controls the integration of sensory information through basically visual stimuli and the limbic system. These regions process learning to read musical notation and the emotional relationship of music (Hyde et al., 2009). The authors noted the application to children with developmental problems and neurological diseases in adults.

**Rhythm as intervention for literacy deficits.** About 7% of children have developmental dyslexia (Goswami, 2011). Goswami (2011) defined developmental dyslexia as “a specific learning disability affecting reading and spelling that is not due to low intelligences, poor educational opportunities or overt sensory or neurological damage” (p. 3). The poor phonological skills associated with dyslexia are a heterogeneous mixture that affects different languages. The more debilitating dyslexia is found in languages with deep orthographies or not easily predicted pronunciations. The deep orthographic languages include Chinese, Danish, and English; the shallow orthographic languages include: Czech, Greek, Italian, Japanese, Norwegian, Persian, Swedish, and Welsh (Brunswick, McDougall, & Davies, 2010). There is no
simple explanation or single root cause of dyslexia; however, temporal sampling framework attempts to gather information from different research and assimilate it into a theoretical framework (Goswami, 2011).

**Temporal sampling theory.** Temporal sampling theory arose because of the noted association between poor readers and poor rhythmic reproduction (Bhide et al., 2013; Gordon et al., 2015; Holliman, Wood, & Sheehey, 2010). Music and speech both involve rhythm. Music uses rhythm in how it is performed, and speech uses rhythm in how it is spoken. The ability to predict or anticipate when the timing occurs is essential to sequential organization of sounds in both music and speech (Huss et al., 2011; Thomson & Goswami, 2008). The speech timing is reflected in reading.

Rise time relates to the stressed and unstressed syllables and segmental phonology (Beattie & Manus, 2012). An example in segmental phonology is the difference between the slower rise time of “sh” and faster rise time of “ch.” Rise time problems imply impairment in differentiation between modulation frequency ranges, perhaps from ineffective neuronal oscillations (Goswami, 2011). Goswami (2011) posited that “an oscillatory perspective can explain why auditory sensory difficulties lead to phonological impairment in dyslexia [and, by extension, specific language impairment (SLI)] and might also enable a systematic approach to integrating other sensory impairment in dyslexia” (p. 4).

Temporal sampling theory allows variations in students together with differing levels of phonological memory, digit span, non-word recognition, rapid phonological output, rapid automatized naming (RAN), syllable stress, matching multi-syllabic words, prosodic perception (tone), DeeDee tasks, and magnocellular function (Goswami, 2011). DeeDee tasks take historical/famous persons and substitute “Dee” for each syllable. For example, Jimmy Carter
would be Deedee Deedee. Moreover, magnocellular functions consist of noise exclusion, sluggish attention shifting, balance, and matching a beat (Goswami, 2011). Students with developmental dyslexia or speech impairment can be described as “brains that are in tune but out of time” (Huss et al., 2011, p. 675).

The rise timing problem is seen early in students. Children who are two and three years old show signs of reading problems by the number of syllables spoken per second. Children at risk for impairment speak 4.8 syllables as compared to children not at risk who speak 7.1 syllables (Goswami, 2011). Additionally, challenges in matching rhythm or beat are also identifiable early.

**Rhythmic entrainment or tapping to the beat.** Babies match the sounds and rhythms around them. If children are hearing, they will “babble” in rhythm to the sounds that they hear. Babies who are Deaf, “babble” with their hands in the same signs and rhythms as the signing adults around them (Corriveau & Goswami, 2009). A number of studies have found significant rhythmic impairments in students with dyslexia (Beattie & Manus, 2012; Bhide et al., 2013; Corriveau & Goswami, 2009; Geist & Geist, 2012; Goswami, 2011; Holliman et al., 2010; Huss et al., 2011; Lucas & Gromko, 2007; Magnan et al., 2004; Moritz et al., 2013; Overy et al., 2003; Phillips-Silver & Trainor, 2008; Strait et al., 2011; Tallal, 2004; Thomson & Goswami, 2008; Thomson et al., 2013; Tierney & Kraus, 2013; Tsang & Conrad, 2011). Dyslexic students have difficulty tapping while matching a beat. The disparity in rhythm entrainment is observed when matching external auditory rhythms (Thomson & Goswami, 2008). For example, unpaced rhythm entrainment showed no motor dexterity differences between children with or without a reading disability; however, when introduced to a paced metronome beat, the children with dyslexia had varying degrees of success. How severe the discrepancy was has been linked to the
level of speech and language impairment (Corriveau & Goswami, 2009). Adult dyslexics continue to show rhythm entrainment discrepancies (Thomson, Fryer, Maltby, & Goswami, 2006).

Bhide, Power, and Goswami (2013) and Long (2014) conducted studies that employed rhythmic interventions as a separate curriculum to affect improvement in reading. Both studies performed a rhythmic musical intervention with struggling readers. Bhide et al. (2013) employed nineteen 25 minute sessions over a two-month period while Long (2014) added 10 minutes to the weekly music lesson over a six week intervention.

Bhide, Power, and Goswami (2013) used 19 six and seven year old students, identified by their teachers as poor readers, as participants in the study. Nine of the students participated in an alternate group working with a letter-recognition program, GraphoGame Rime. The GraphoGame used in the study was designed to work with the deeper orthographic English language. It uses a computer in a child-friendly game format. The game had previously demonstrated significant results with poor readers (Kyle, Kujala, Richardson, Lyytinen, & Goswami, 2013).

A total of 10 students participated in the rhythmic musical intervention. The intervention consisted of a selection of four to five elements per one-on-one session. The musical intervention consisted of (a) tapping the space bar on a computer in time to a metronome (b) deciding between same-different metronome beats; (c) judging between same-different short rhythmic patterns; (d) imitating a short rhythmic pattern; (e) assessing rise time ability through the ability to answer which sound began softer, higher, or longer; (f) physically clapping or marching to a beat; (g) learning chants to hand-clap games; (h) answering questions on rhythm about a poem read to the students; (i) Dee-Dee game (Bhide et al., 2013).
The results demonstrated similar significant effects for both programs. The musical intervention showed a large effect size for non-word reading, spelling, rhyme awareness, and phoneme deletion (Bhide et al., 2013). The rhythmic entrainment portion of the program showed the largest temporal improvement in the students with the greatest problems in their initial rhythmic training (Bhide et al., 2013). The results demonstrated the intervention was having the theorized outcome. Bhide, Power, and Goswami (2013) found “modest support for the hypothesis that improvement in rhythmic entrainment should be correlated with improvement in reading” (p. 118). Additionally, the rhythmic musical intervention did not specifically target reading skills; however, the results of the research indicate that rhythmic training could have a positive effect on literacy skills (Bhide et al., 2013).

Long’s (2014) study used a group method in the general music education classroom. The 15 participants were 9-10 years of age and identified as weak readers by the school staff. The researcher implemented the intervention once a week for six weeks. The class received 10 minutes of rhythmic activities from their normal music teacher who received training for the intervention. The program utilized entrainment, or synchronization of the beat, and cognitive attention to the rhythm exercises. The rhythmic intervention produced significant results both in assessment and student perception. Reading comprehension and rate improved by a large effect, and reading accuracy improved with a medium effect (Long, 2014). Additionally, the children’s perception of their reading abilities improved. The study was a mixed-method of quantitative and qualitative data and the sample size was small. However, the improvement in reading was a large effect with minimal curriculum cost and training.

*Emotional and behavioral effects of music.* Music and rhythm can have a significant effect on the learning process. The brain must be emotionally ready to learn. Students with
emotional disabilities can find help with varied forms of music. The use of Rap, chants, and cadences has been effective in varied disciplines to facilitate a learning progression (Cieierski & Bintz, 2012; Williams, McCauley, & Grumble, 2013). Moreover, the effects are significant at an emotional level also. Music and movement have been used to regulate emotions in trauma survivors (Foran, 2009).

Pitch in music is mapped directly onto the brain. The auditory cortex has a tonotopic map of high to low tones (Levitin, 2006). When researchers attach electrodes to the brain and play a sound, the electrode repeats the exact frequency of the pitch (Levitin, 2006). Because music utilizes more areas of the brain, children with learning disabilities can employ music to therapeutically strengthen their brain (Foran, 2009). Sacks (2007) posited music, especially learned at an early age, stays “engraved” on the brain. Music activates many areas of the brain including: emotions, rhythm, tone, pitch, and movement. Participation in music lessons also more rapidly thickens the cortical areas associated with coordination, emotion, planning, visuospatial skills, and impulse control (Hudziak et al., 2014). Sacks also acknowledged the resilience of music in the brain through the recall ability of victims of amnesia, stroke, depression, aphasia, and various other brain damages problems (Sacks, 2007).

Locke and Clark (2009) noted the enhancement of social interaction through the use of African drumming with students. Three categories of children received the intervention: developmentally disabled, behaviorally disabled, and typically developing children. Furthermore, three areas were assessed: attention, engagement, and aggression. The participant children were more actively engaged throughout the day with stronger engagement in learning; however, the behavioral aspect assessment showed no improvement. The intervention took place
one time a week for 25 minutes over a 4-month span. The researchers theorized a more consistent and long-term benefit could be achieved with a longer study.

Music has been successfully used to develop socio-emotional behavior for school readiness and adjustment of school behaviors (Chong & Kim, 2010; Ritblatt, Longstreth, Hokoda, Cannon, & Weston, 2013). While both studies demonstrated the effectiveness of music as a tool for behavioral improvement, both showed no significance on an academic level. However, a multitude of other studies have demonstrated significant effects on academic achievement (Habib & Besson, 2009; Hille et al., 2011; Hyde et al., 2009; Kouri & Telander, 2008; Moreno et al., 2009; Oechslin et al., 2013; Piro & Ortiz, 2009; Posner & Patoine, 2009; Rickard et al., 2010; Trainor, 2012; Wandell et al., 2008). Like art, music has a therapeutic effect, allowing students to release frustrations in a positive manner. Sometimes frustrations can be funneled through percussion instruments. Music and rhythm allow an outlet for aggression in a socially acceptable manner (Rickson & McFerran, 2007). Additionally, as the emotional/behavioral feeling became more positive, the volume level decreased and care for the instruments increased (Chong & Kim, 2010).

Hallam (2010) reviewed the empirical evidence for the “effects of active engagement with music on the intellectual, social and personal development of children and young people” (p. 269). Hallam surveyed 146 literature sources from 1966-2009 that support the conclusion that music is helpful in many areas, including perceptual and language skills, literacy, numeracy, intellectual development, general attainment, creativity, social and personal development, physical development, and health and well-being. Emotional benefits included social cohesion, self-esteem, motivation, confidence, greater self-reliance, better social adjustment, more positive attitude, and different means of communication (Hallam, 2010). Music also provided a release
for stress and developed self-discipline coupled with resiliency. Finally, music can increase emotional sensitivity to the environment in which children live.

Gold, Wigram, and Voracek have produced a series of studies over the last two decades on the efficacy of music therapy (Gold, Voracek, & Wigram, 2004; Gold, Wigram, & Voracek, 2007). These studies continued to show the effectiveness of music as therapy for individuals with psychopathology; however, the long-term effects are questionable. The Gold, Wigram, and Voracek (2007) study showed small to medium effect on parent rating of symptoms, confidence level, and parent rating of quality of life. The improvement was greater when the participants were younger. Gold et al. (2007) theorized that while music therapy can be a powerful tool, “it does not work as well as it could” (p. 296). Further longitudinal studies with larger groups of participants both in the intervention and control group are in progress (Porter et al., 2012).

**Rhythmic Intervention**

I based the rhythmic intervention implemented in this intrinsic, holistic case study on principles established in Dalcroze, Kodály, Orff, Tataku, and research-based reading instruction (Findlay, 1971; Frazee, 1987; Gordon et al., 2015; Houlahan & Tacka, 2008; Kalani, 2005, 2008; Kelly, 2012; Matney, 2008; Mead, 1994; Montgomery, 2012). Using the methodologies of Dalcroze, Kodály, Orff, and Tataku aids in successful development of rhythm in students. Teaching rhythm is most effective through the use of bodily and particularly large-body movement (Crouch, 2006; Ferguson, 2005; Findlay, 1971, Frazee, 1987; Houlahan & Tacka, 2008; Kalani, 2005, 2008; Matney, 2008; Mead, 1994; Seitz, 2005). “The memory of a rhythmic experience lasts in the muscles long after the experience has passed. The use of the whole body, that is, the larger muscle groups, assures a more lasting comprehension of rhythmic concepts” (Meek, 2011, p. 12).
Zachopoulou, Derri, Chatzopoulos, and Ellinoudis (2003) used Dalcroze and Orff rhythmic techniques to improve 72 kindergarteners in seven areas of rhythm implementation. The seven activities showed a significant improvement in all areas with a multivariate group effect of $F_{7.58} = 2.82$, $p<.05$.

**Dalcroze Eurhythmics.** Emile Jaques-Dalcroze (1865-1950) was a Swiss professor of music at the Geneva Conservatory; he observed the instinctual way students move to life and music. Dalcroze implemented his technique with his students and noticed rhythmic improvement in his students (Mead, 1994). In 1905, he spoke on ‘Proposals for a Reform of Music Instruction in the Schools’ at a music conference (Mead, 1994). His ideas for the importance of rhythm (eurhythmics), melody (solfège), and harmony (improvisation) were widely accepted with the establishment of the first Dalcroze School in 1913 in the United States (Anderson, 2012; Jacobi, 2012b).

Eurhythmics is derived from the Greek root words of *eu* (good) and *rhythmos* (flow or movement) (Mead, 1994). Dalcroze noted the importance of rhythm in nature, the human body, daily activities, memory, and aesthetic pleasure (Findley, 1971). Because children unconsciously produce rhythmic patterns, Dalcroze methodology brings conscious emphasis of children’s natural rhythmic responses to produce at will reproduction that become automatic (Long, 2014). The use of kinesthetic abilities, “and the assertion that the relationship between music and movement is an intimate one, is at the heart of Dalcroze’s approach to instruction” (Anderson, 2012). The student’s use of movement is meant to be a differentiated teaching tool that gradually instructs each child rather than a choreographed movement for the class as a whole (Farber & Thomsen, 2014).
Dalcroze noted two different problems with rhythm in students: “arrhythmia” of the inattention to rhythm and “errhythmia” or misapprehension of rhythm (Long, 2014, p. 108). Children with reading disabilities also display these two weaknesses (Atterbury, 1983). The Dalcroze method is evidenced in the echoing beat, matching metronome speed, same and different rhythms, and rhythm speech.

**Kodály.** Zoltán Kodály (1882-1967) was a Hungarian composer, musician, and ethnomusicologist whose research interests were music literacy and preserving ethnic folksongs (Göktürk, 2012; Organization of American Kodály Educators, 2014). He was influential in the adaptation of music schools in Hungary (Mason, 2012). The Kodály method emphasizes “sound before sight [and] going from known to unknown” (Jacobi, 2012a, p. 11). The experience-based method employs hand signs for pitches, movement in music, rhythm syllables, solfege, notation of music, and correct pitch production (Houlahan & Tacka, 2008).

Kodály developed a method that utilized three P’s: preparation, presentation, and practice (Mason, 2012). Preparation is the cognitive stage and develops kinesthetic awareness, aural awareness, and visual awareness (Houlahan & Tacka, 2008). For example, kinesthetic awareness in rhythm requires students to: direct to feel meter; clap the beat; adapt the beat to a new rhythmic pattern; associate rhythm with a visual; or, sing silently while clapping the beat (Houlahan & Tacka, 2008). Aural awareness asks varied questions about qualities of the beat including: the number of beats, new beats, the length of the beat. Visual awareness refers to musical notation in sketch or traditional notation (Houlahan & Tacka, 2008).

The associative phase or presentation “label[s] the sound [and] presents the notation (Houlahan & Tacka, 2008, p. 242). A quarter note would receive the rhythmic syllable of “ta” and the sketch notation would be a straight line. Lastly, the practice or assimilative phase gives
initial and continued activities in reading, writing, improvising, listening, and sight-reading (Houlahan & Tacka, 2008). Practicing these skills over time allows for integration of the knowledge with previous skills. The Kodály methodology is evident in the echoing beat, matching metronome speed, same or different rhythm, and writing the beat portions of the rhythmic intervention.

**Orff.** Carl Orff (1895-1982) was a German-born Bavarian from a musical family. He learned to play piano, organ, and cello before joining the German army in World War I (Göktürk, 2012). After studying composition, Orff began to work with Dorthee Günther in 1924. Together they began the Güntherschule. The school taught gymnastics, music, dance, and rhythmic movement (Göktürk, 2012). It was in the Güntherschule that Carl Orff produced the Orff–Schulwerk or the Orff Method and later codified the method into five volumes, *Orff-Schulwerk: Musik für Kinder* [Music for Children, 1950-1954] (Göktürk, 2012).

Orff combined many different elements into a curriculum to support the whole child. These elements included: music, studies in rhythm, visuals, verbal and non-verbal songs, movement, instruments, and dance (Eren, Deniz, & Düzkantar, 2013). The Orff approach begins with basic elements and involves the entire body and has been used in music therapy for children (Register & Hilliard, 2008; Shafer & Silverman, 2013; Young-Bae & Ji-Eun, 2013). Body beats can include walking, stamping, skipping, knee-pats, clapping of hands, snapping of fingers, and their combination (Hochheimer, 1976).

Kinesthetic movement is the foundation upon which the group Orff Method is based (Frazee, 1987). Orff teachers utilize a child’s innate desire to move, imitate, and explore the rhythmical movement potential of their bodies. This includes the use of verbal rhymes to ease and clarify teaching rhythm. For example, using students’ names alone or in combination train
the ear rhythmically but also build self-esteem and lesson involvement (Fidyk, 2009). Rain talk or Pitter Patter Chatter can be used in multiple ways at patterns (Pit, pat, pitter, patter, chat, chitter, chat or quarter, quarter, two-eighths, two-eighths, quarter, two-eighths, quarter). The goal of Rain Talk or Pitter Patter Chatter is to have multiple parts performing at the same time. Moreover, speech or song can be combined with instruments or body beats and movement (Frazee, 1987). The Orff system is evident in the matching metronome speed, same or different sets, body beat, movement to the beat, and rhythm speech.

**Tataku.** Tataku is a Japanese word meaning “to strike”, “to hit”, “to beat on a drum”, or “to beat out a rhythm” (Matney, 2008, p. 13). Japanese drums or Taiko/Daiko are barrel-shaped wooden drums played with strong body movements (Bender, 2012). Ancient Taiko drumming is rooted in Buddhist rituals and traditional festivals (Knapp, 2011). However, the Japanese Kodo group formed in the late 1960’s led to the popularization of Tataku as a folk music style (Bender, 2012). Japanese Kodo’s first performance in the United States was in 1975 (Bender, 2012). The performance was rigorous, dramatic, and choreographed (Knapp, 2011). The Taiko ensemble was comprised of different drums or other instruments (hand cymbals, Japanese flute, gourds, and conch shell) playing a composite rhythm (Powell, 2008).

Tataku is representative of the percussion instruments and the therapeutic function they serve in a music therapy setting (Matney, 2008). Tataku has the following stated goals: (a) understanding the instruments history and cultural significance; (b) investigation and awareness of the musicality of percussion; (c) discovering why percussion instruments work in a therapeutic setting; (d) exploring how percussion instruments can be used in a therapeutic setting; (f) teaching instrumentation skills; and (g) producing life-long learners in the field (Matney, 2008).
Tataku posits rhythm as the foundation upon which all musical elements exist. Whether timbre, pitch, melody, or harmony, they all are part of the “primary milieu of rhythm” (Matney, 2008, p. 142). Matney (2008) defines rhythm as “anything that recurs in time” (p. 144). Because rhythm is a vibration, it is a motion; therefore, rhythm can generally be seen, heard, or felt. Tataku’s primary emphasis is on musical therapy and how it affects human emotion. The external forces of rhythm and movement are harnessed to interpret the internal rhythm and movement of the body and mind. The Tataku portion of the rhythmic intervention is demonstrated in echoing the beat, body beat, and entrainment of the beat.

Classroom Culture for Students with Disabilities

Classroom culture is important for successfully learning in all students. In students at-risk or with disabilities, it is critically important. (Castro-Pérez & Morales-Ramirez, 2015; DiTullio, 2014; Kiura et al., 2012; Lesaux, Harris, & Sloane, 2012). A students’ enjoyment of a class affects both academics and classroom behavior (Degener & Berne, 2014; Marchard-Martello, Martello, & Lambert, 2015; Noltemeyer, Joseph, & Kunesh, 2013; Weiss, 2013). Furthermore, the students’ perception of their abilities is more important than the curriculum itself (Cheng, 2015). Self-efficacy, defined as how a student feels about their academic abilities, specifically effects students with disabilities (Bergen, 2013; Ju, Zhang, & Katsiyannis, 2012; We & Marder, 2012). This result is noted in early elementary grades and predicts future academic achievement (Ju et al., 2012).

Confidence in the classroom setting is an important element for student success. An individual needs to believe they can succeed to see the greatest growth in learning (Demirdag, 2015; Favazzo, Wilford, & Watson, 2014; Matthias & Hessling, 2009). Mok (2013) noted the importance of self-efficacy in his book on self-confidence case studies. In primary students,
higher grades were projected for students with higher levels of self-confidence. This was true even after controlling for age, gender, intelligence, parent-child dynamics, and other factors (Mok, 2013).

The confidence of teachers both in their own abilities and those of their students has an effect on classroom culture and student success. Teachers generally gave higher grades to students who were confident in their academic performance. This was true even after controlling for age, gender, intelligence, parent-child dynamics, and other factors (Mok, 2013).

Moreover, studies reveal students also responded to the confidence reflected by their teachers (Atta et al, 2011; Shaunessy & Mchatton, 2009; Siegle, Rubenstein, & Mitchell, 2014). These teachers felt confident in their materials and were not afraid to stray off the given curriculum. They also knew their students well and had meaningful discussions with them (Oades-Sese, Matthews, & Lewis, 2014; Osler & Nichols, 2013; Siegel, Rubenstein, & Mitchell, 2014). Furthermore, positive teacher beliefs lead to greater student self-esteem, sense of belonging to the school, and academic achievement (Farrelly, 2013; Lee & Bierman, 2015; Pasto, 2014).

However, not all teacher instruction reflects student achievement. When students with disabilities learn from another peer, they are more likely to believe they can do the activity than if a teacher demonstrates it (Bergen, 2013). Peer-tutoring can be an effective teaching method, and it is more effective with students with disabilities than general education students (Bowman-Perrott et al., 2013; Topping, Duran, & Van Keer, 2016).

Small group activities increase students’ achievement more than one-to-one instruction (Hunzer, 2012; Serravallo, 2010; Wasik, 2008). The smaller group allows teachers to better connect with their students’ needs and differentiate instruction. Additionally, discipline is easier
to manage in a small group. Likewise, teacher-student and student-student interactions were more positive and transfer of knowledge was stronger (Pai, Sears, & Maeda, 2015; Wasik, 2008).

Connection between students and students and the school is also an essential element of positive classroom culture. Students with positive peer relationships do better in school and in society (Cheng, 2015; Park & Park, 2015). However, positive connections are more difficult for students with disabilities (de Boer, Pijl, Post, & Minnaert, 2013). Likewise, for students with learning disabilities friendships are not as numerous or robust (Wong & Butler, 2012).

While positive teacher-student relationships prove to be a consistent factor in students’ success both academically and socially, students with learning disabilities specifically need continuous teacher support (Cambria & Guthrie, 2010). Teacher-student relationships “were more important for children who were academically at risk . . . from disadvantaged backgrounds and children with learning difficulties” (Roorda, Koomen, Spilt, & Oort, 2011, p. 520). A teacher who is supportive has the same effect as one to two years of intervention on students (Spilt, Hughes, Wu, & Kwok, 2012). Alternatively, a negative relationship has a correspondingly detrimental result in learning (Bernstein-Yamashiro & Noam, 2013; Spilt et al., 2012).

At-risk students do better with teachers who believe the children can succeed and believe the children are attempting to learn (Wong & Butler, 2012). Furthermore, a positive relationship was particularly important for minority groups with African-American males most affected (Spilt et al., 2012). Likewise, the connection of the teacher with his or her students played an important role in their success, and Alderman and Green (2011) list likeability as one of four main area to improve overall student performance.
Finally, the choice of curriculum is an important element of positive classroom culture. A number of studies have listed an engaging curriculum as foundational for student learning (Christenson, Reschly, & Wylie, 2012; Schlechty, 2011). Furthermore, interventions implemented by researchers were more effective than those implemented by teachers (de Boer, Donker, & van der Werf, 2014). Self-determination is a best practice in education and specifically in students with disabilities affecting academic and personal life; therefore, choice in the curriculum makes a difference in student learning (Lee, Wehmeyer, & Shogren, 2015).

Summary

Music/rhythmic interventions aid in the acquisition of literacy skills in students. Because literacy and music are processed through the posterior callosum, training in tonal and rhythmic production holds promise for helping develop literacy skills in pupils. In 1983, Atterbury’s (1983) seminal study on the musical abilities of children with reading disabilities and normal-ability children noted the difference between these learners included rhythmic processing. Atterbury posited the connection between poor readers with poor rhythm. She postulated a deficit in the left hemisphere of the brain because both reading and music are processed in the same area of the brain.

Atterbury’s (1983) study showed significantly different responses to a rhythmic instruction between two groups. The readers tested were between seven and nine years of age. In each assessment, children with a reading disability tested lower than their normally developing peers. These areas included pitch/tonal and rhythm (Atterbury, 1983).

Furthermore, Thomson, Fryer, Maltby, and Goswami (2013) found medium to large significant effects in spelling, word and non-word reading, rhyme perception, rise time discrimination and Spoonerisms with a 6-week rhythmic and phonetic training program for
children with developmental dyslexia (p. 154). “The data suggest that rhythmic training has an important role to play in developing the phonological skills that are critical for efficient literacy acquisition . . . This may be especially true for those who appear resistant to conventional phonics training methods” (Thomson et al., 2013, p. 139).

Additionally, classroom culture is an essential element in student success in the classroom. How a student feels about his or her abilities is reflected in how well they do in a class (Cheng, 2015). Moreover, the teacher’s perception of the child’s abilities is in direct correlation to their grades and sense of connection to the school (Farrelly, 2013; Lee & Bierman, 2015; Pasto, 2014; Siegle et al., 2014). Furthermore, small group activities increase student learner over one-to-one interventions (Hunzer, 2012; Serravallo, 2010; Wasik, 2008). Finally, students’ enjoyment of the curriculum is crucial to engage the learning process (Christenson et al., 2012; Schlechty, 2011).

Students at-risk for failure and students with reading disabilities appear to benefit from rhythmic interventions designed to teach literacy without direct instruction in the discipline. However, assimilation of information for the long term is better remembered in both long and short-term memory through connections (Stravrou, Smaragda, & Harris, 2011). Goswami (2011) stated interventions created based on multi-modal rhythm and music could help students with developmental dyslexia. Because meter and rhythm are more obvious in music than language, a remediation based on both might influence language and phonological development. A program designed primarily as a musical/rhythmic intervention with ties to literacy through read-alouds holds promise for observable improvement in literacy skill. Therefore, the following case study was designed to emphasize rhythm and activate the left hemisphere of the brain producing accelerated literacy acquisition.
CHAPTER THREE: METHODS

Overview

This is a qualitative study that used an intrinsic, holistic case-study approach to investigate a rhythmic intervention to teach reading skills in second graders already at risk for failure in literacy. The purpose of this single case study is to describe and analyze the impact of a rhythmic intervention designed to support literacy skills in second-grade students at-risk of failure of state mandated reading assessment. This case study is based on disability theory (Finkelstein, 2001), (Hunt, 1966) and critical realism (Bhaskar & Danermark, 2006). Critical realism, as applied to disability theory, reflects the unique combination of needs a person with disability faces: socio-economic, physical, biological, psycho-social and emotional, psychological, cultural, and normative.

Chapter three includes the methods used in the intervention. Topics include the design and research questions that shape the study. The chapter describes the setting and the participants. In addition, a description of the procedures in the study and the researcher’s role are analyzed. Furthermore, data collection including interviews, observations, pictures, and documents are studied, and data analysis is explained. Finally, issues of trustworthiness and ethical concerns are addressed.

Design

The purpose of this intrinsic, holistic case study is to describe and analyze the experience of second-grade students at-risk of literacy failure of state mandated reading tests utilizing a rhythmic intervention. A case study is defined as “an all-encompassing method–covering the logic of design, data collection techniques, and specific approaches to data analysis” (Yin, 2014, p. 17). Therefore, a holistic approach was chosen to best describe the rhythmic intervention and
the participants’ perceptions (Creswell, 2013). The single case was chosen to better assess the initial assumption of the viability of a rhythm program as a facilitator of literacy growth (Yin, 2014). While my personal experience and bias were noted, I attempted to form a strong empathetic bond with the participants to better reflect their shared experience through extensive case description, presentation of key issues and themes, affirmation or rejection of the evidence, and assertions of the study (Creswell, 2013). There was no way to completely eliminate personal bias (Diener & Crandall, 1978); however, an open acknowledgement and attention to all areas of authenticity in the research were essential for the interpretation to maintain trustworthiness and authenticity (Schwandt, 2007).

**Research Questions**

The research questions for the study are as follows:

**RQ1:** How do second-grade students describe their learning experience with a rhythmic intervention over a bounded time period?

**RQ2:** What are the perceptions of general education teachers about a rhythmic intervention and their students’ response to the intervention?

**RQ3:** What do descriptions and pictures drawn by second-grade students reveal about their personal feelings about a rhythmic intervention and their literacy instruction?

**Setting**

In a case study, the setting was crucial to understanding the case. Stake (2005) posits that the context and nuances of the research setting shapes the qualitative understanding of cases. The background shapes the experience itself and is foundational in interpreting the activity. In case studies, it is rare to not study the situation.
The study took place in an urban school district in the Midwest (see Appendix A). East Elementary School was rated as a C school in the state and performed below the state average and the state standards in 2012-2013 (State DOE data). While its standing in the state ranks has risen from the bottom 5% in 2008 to the bottom 50.2% in 2012, the school has dealt with many problems associated with lower socio-economic schools. These problems included 89% free/reduced lunches, gangs, English as a second language, and lack of higher education within the family setting. The median income was $38,396, with 22.1% of families being below the poverty line (U. S. Census Bureau, 2007-2012). The district had 13% participation in Special Education, and 15% listed as English Language Learners (State DOE data, 2012-13). The state had a mandated reading assessment which determined entrance to fourth grade. Over 93% of third graders passed this test in the 2013-2014 school year. Additionally, the East Elementary score on the English only ISTEP was 68% pass school-wide with a district 68% and state 81% in the 2013-2014 school year (State DOE data, 2012-2013). I used pseudonyms for the school and its administration, and composites including slight number modification that did not affect the research result were employed to further protect the school and all participants. Composites are a compilation of participants. For example, descriptive characteristics are randomly divided among the narrative of the characters rather than an exact characteristic to person description. This helped further protect the participants’ identities from accidental identification.

The setting of the interventions took place in three rooms of the East Elementary School. Even though the district has a 90% poverty rate, the school was a new building and well-equipped. The classrooms have Promethean boards, and there are several computer labs. The teachers and staff decorated the rooms and the hallways extensively. The hallways contained
artwork, encouraging messages, and data collection goals and present levels. The students generally sat in a circle or semi-circle in the rooms.

Almost half of the interventions took place in the main music room of the school. The room was carpeted with beige and blue carpet and contained standard equipment in a music school room. This included: a Promethean board, white board, computer, piano, CD player, various instruments, and chairs with a desk that could rotate out of the way as needed. Additionally, the room had a storage room where the supplies for the intervention were kept. These included: soccer balls, buckets, sticks, metronome, books, same/different pages, and scarves.

Half of the interventions took place on a closed-off portion of the stage in the gymnasium. The section had tall ceilings, sliding walls on one side, a tall storage cabinet, an American flag, a piano, a large black curtain, tile floor, and stackable chairs. The lack of carpeting affected the sound quality of the buckets for drumming. Moreover, the sound reverberated in general. On one occasion a strong ice cream smell was noticed along with a slippery-sticky floor. The school had a whipped cream pie throwing activity, and the floor had not been cleaned. The custodians of the school were conscientious and helpful with the intervention. The room was very close to the music room and transferal of materials was quick. Moreover, the students were helpful in putting materials away.

The twelfth and last intervention took place in the secondary music room. Both of the other areas were needed for other activities that day. The room was not set up as a music room. There were a number of tables to facilitate group work, computer, Promethean board, and white board. There was carpet on the floor, and the room was directly connected to one room and in close proximity to the in-school discipline room. The lack of separation in the room, unlike the
other two rooms, was a factor in the last lesson. Moreover, the distance between materials and room was substantial.

Lastly, the placement of the second-grade section of the school and the music room and gym were on opposite sides of the school. The travel time between the second-grade rooms and music room was a factor in the intervention. The thirty minute time spot had to be followed closely to keep schedules intact.

Participants

A purposive sample of second-grade students at-risk of failure for state mandated literacy assessment was used for the study. Participants were selected on the basis of a noted discrepancy of at least one year behind their peers in reading. Furthermore, they had been identified for additional reading interventions by their teachers and their school. The gender of the students depended on the children available in the school district at-risk of failure in the state mandated assessment. The four teachers were fully licensed elementary teachers in the state. They were selected by volunteering to work with the case study. Because White female teachers outnumber other ethnic groups in this Midwest community, it was anticipated the teachers would be White females. The racial population for teachers in 2010-2011 listed 94.6% White, 2.7% Black, and 2.7% Asian (State DOE data, 2010-13). Pseudonyms and composite profiles were used for the participants.

Procedures

Prior to collecting data Institutional Review Board (IRB) approval was secured. The four teachers were contacted for their informed consent and their recommendations for students at-risk of failure of the state mandated testing for reading. Consent from teachers (see Appendix B) and assent for the student participants (see Appendix C) was obtained. The students’ parents or
guardians were contacted for their permission and informed consent forms were signed (see Appendix D).

Data were collected through interviews with student and teacher participants, site documents for relevant data on the student participants reading ability, recordings of the 12 interventions, and pictures drawn by the students. The semi-structured interviews took place on the third and sixth week of the intervention and involved all participants, both students and teacher. Interviews were transcribed and coded for themes. Site documents were collected before, during, and after the study while performing the standard assessments of the school. Recordings were made of each session and transcribed for clarity of the rhythmic intervention curriculum. Finally, the students were asked to draw pictures that described their personal vision of the rhythmic intervention, and to explain their drawings in the final interview.

**The Researcher's Role**

As a third-generation teacher, my background has been strongly influenced by the experiences of teachers in the classroom. My mother was an innovative teacher with a master’s degree in reading, plus extensive post-graduate work in special education and administration. She taught almost 60 years and spent over 40 years working with children with special needs, including reading disabilities, early childhood interventions, and severe disabilities. With a personal disability of dyslexia, my mother had a unique empathy for children with special needs.

My education includes a BA in sacred music/voice, 41 hours on an MA in musicology, a MAT in special education, and the present Ed.D. in curriculum and instruction. I have been a teacher for 30 years in diverse environments that includes music ages K4-college, special education that includes an emotionally disabled environ, substituting at all levels and subjects for nine years, and K4-12 homeschooling of two gifted children. My licensure is highly qualified in
music, special education, elementary, and reading. At the time of the study, I had worked for the school district two years; however, I worked in a middle school/high school setting. The first year in the district I worked as a mild interventionist for 10th grade English; the year of this study and the intervention, I served as the music teacher/choir director of both the middle school and high school.

While East Elementary was in the school district in which I work, I had never met the principal, teachers, or students involved in the study. This was the first year for the principal in this school. While I had never been in the school itself, I had very limited contact with the music teacher in the school to set-up an honors choir for the fourth and fifth grade students that occurred in the spring.

My oldest daughter had dyspraxia, and working with her disabilities particularly in speech emphasized the challenges that speech disabilities can bring to literacy skills. Her literacy skills improved dramatically with a generally successful speech intervention, nose surgery, and seven years of dental work. Additionally, a close friend had a child with cognitive deficits. As a young adult, he read at a fourth-grade level and had problems with tonal and rhythmic production.

My personal assumption was a rhythmic intervention would prove effective in improving music and literacy skills. I also believed the program would enhance the behavior of the children in the intervention. Finally, I developed the 12-lesson curriculum and implemented the intervention myself. The program combined elements of Kodaly, Orff, Dalcroze, Tataku and age-appropriate percussion instruction.
Data Collection

The data collected for this study provided a thorough and clear picture of the experience with the rhythmic intervention for second-grade students and teachers. Semi-structured interviews were conducted with the teachers and students. The students were asked to draw pictures representative of the intervention and requested to provide insight into their meaning. Site documents, which included the students’ reading level, were examined. Observation occurred through the recording of the rhythmic intervention lessons.

Rhythmic Intervention

The rhythmic intervention involved all the students in the second grade at the elementary school deemed at-risk of failure of the state mandated reading assessment whose parents/guardians agreed to participate. While I acknowledge these students as having a specific learning disability, they did not have to be in the special education program to participate. The interventions were in a separate room than the general education for the second grade classrooms. This was necessary for the volume of the drumming and rhythmic responses. The thirty minute rhythmic intervention took place at 10:45 a. m. in the morning with school ending at 3:30 p. m. The rhythmic intervention implemented in this intrinsic, holistic case study was based on principles established in Dalcroze, Kodály, Orff, Tataku, and research-based reading instruction (Findlay, 1971; Frazee, 1987; Houlahan & Tacka, 2008; Kalani, 2005, 2008; Kelly, 2012; Matney, 2008; Mead, 1994; Montgomery, 2012). Materials included appropriate literature, drum sticks, buckets for drums, metronome, same or different signs, balls, and use of visual media as appropriate.

This intrinsic, holistic case study rhythmic intervention was comprised of twelve 30 minute sessions. As noted previously, the following 10 elements were combined in the lessons.
Not all elements were used in every lesson; however, reading literature and entrainment, or synchronization, of the beat was used in each session.

**Entrainment of the beat.** In 1666, Christian Huygens noted that two pendulum clocks placed in the same room synchronized themselves together (Bolden, 2009; Thaut, 2013). This phenomenon is called entrainment. Theoretically, entrainment takes place to save energy (Matney, 2008). Because it takes less energy to pulse together, rhythms near each other pulse collectively (Matney, 2008). The idea of entrainment carries over into mental abilities. For example, the rhythm of physical exercise causes some people to think clearer (Bolden, 2009). The rhythm puts them into a space where higher critical thinking skills can more easily take place (Bolden, 2009). Temporal entrainment has recently shown promise in Neurological Music Therapy. Entrainment seems to help executive function, memory, and attention (Thaut, 2013).

Entrainment and rhythmic matching entailed establishing a beat for a minimum of four beats and having the class join. Once the beat or pulse was regular, the instructor varied the beat by playing louder or softer/faster or slower. I chose different leaders during the exercise with the class following their lead.

**Echoing beats.** Students echoed the beats they heard demonstrated by the teacher or their peers. Echoing was different than entrainment as the beat was steady and over four to eight beats. I conducted the echoed beat as a group to start; however, the students performed solo in small group settings as the intervention progressed through the time period. Echoing was done with clapping, body beats, or percussion instrument.

**Matching metronome speed.** Students with reading disabilities whether young or old have shown difficulty matching a metronome speed. The students are slower in accommodating
a change in rhythm, and they foresee the ticks of the metronome less quickly and with less precision (Pasquini, Corriveau, & Goswami, 2007; Wolff, 2002).

After an initial discussion of fast and slow tempos, students echoed the metronome speed they heard. I changed the timing with a stated goal to match the tempo; however, as time progressed throughout the intervention, the students performed solo or in small group settings. Participants matched the metronome speed with clapping, body beats, or percussion instrument.

**Same or different rhythmic sets.** The teacher played/beat one to two measure phrases. While initially there was one four-beat measure, the intervention progressed to two measure phrases. The phrase consisted of whole note, half-notes, quarter-notes, and eighth-notes. Although the goal of the intervention was not note reading, I expected some recognition of types of notes would occur. Additionally, I taught the students phrases for certain note patterns. For example: two eighth-notes and a quarter-note were stated as “but-ter-fly” (Musikgarten, 2014).

**Body beat.** Body beat was a specific technique in the intervention. The students clapped, tapped, stomped, hopped, or use other movements in time to the rhythm. Moreover, the body beat was also a group activity in a hand-clapping styled game. Students collaborated as a two-person team for four to eight beats to lead the class.

**Ball roll.** Students rolled a ball to another student in time to the music. Furthermore, the ball activity was also done in a circle while chanting “take-pass” or another rhyme in time to the beat (Misenhelter, 2004).

**Writing the beat.** This exercise was twofold: writing what was heard and composing. Kodály’s rhythmic teaching approach of stick notation to traditional rhythmic notations was used (Houlahan & Tacka, 2008). Stick notation used only the top of the quarter and eighth notes and the entire half note. This allowed students to focus on the clear differences between how the
notes are written rather than how they are similar. I showed both notations to the students, and it was assumed they were familiar with the notes through state standards of music. Students attempted to write the four to eight beats they heard and wrote 4-8 beats for the class to perform.

Movement to rhythm/music. The teacher was imitated in the first movement to music. The movement reflected high and low sounds, fast and slow, waltz and march, meter, and illustration of the music itself (Frazee, 1987). Students moved through the space in the room with walking, skipping, hopping, galloping. In all movements, the motions represented the style of the rhythm/music.

Rhythm speech. Students performed various phrases, chants, and rhymes to a speech pattern. For example, Rain Talk or Pitter Patter Chatter taught rhythm while allowing students to experiment with different patterns (Frazee, 1987). Additionally, phrases like “Beat my drum” (2 eighths, quarter), “Doggie, doggie, fetch that bone” (two eighths, two eighths, two eighths, quarter) were used to teach rhythm aurally before visually (Findlay, 1971, p. 37).

Rhythm speech also included traditional hand-clapping rhymes to combine elements of rhythm with a rhyme or poem. Traditional hand-clapping rhymes examples include: Double That; Miss Mary Mack; A Sailor went to Sea; Miss Lucy had a Baby: Hambone; and Long-legged Sailor.

Reading materials. Read alouds were conducted to facilitate the acquisition of literacy skills. Interactive read-alouds enhance literacy in a variety of ways including informational text synthesis (Cummins & Stallmeyer-Gerard, 2011), interpretation of the meaning of the text (Hoffman, 2011), increased enjoyment and time spent in silent reading (Pegg & Bartelheim, 2011), improved genre knowledge and use (Bradley & Donovan, 2011), vocabulary instruction (Holmes, 2014; Kindle, 2009), provision of background information, promotion of the
development of critical thinking skills (Meller, Richardson, & Hatch, 2009), and engagement of learners in the subject (Mayberry, 2014; McCormick & McTigue, 2001). Additionally, read-alouds demonstrated rhythm and rhyme in literature (Cardany, 2011; Kelly, 2012; Montgomery, 2012).

The books for the case study were selected for their quality of literature, engaging word choice, ethnic diversity, and subject (see Appendix E). Moreover, the use of rhythm and rhyme in the text was primary because rhythm had been linked to success in reading and phonology (Goswami et al., 2013; Huss et al., 2011; Long, 2014 Thomson & Goswami, 2008).

The rhythmic intervention was in 12 sessions. There were 23 books that were used as resource (see Appendix E). While not all books were used in the rhythmic intervention, they were available for the teachers and students to use during the case study period. Additional use of materials built background knowledge and furthered the development of rhythmic discrimination in music and reading. Nine of the books were specifically about drums; five introduced the orchestra with percussion; six discussed music using rhythm and rhyme; and three presented historical contexts in story form.

**Interviews**

Teachers and students were interviewed for the study. Because the students were in second grade, their responses reflected their age, understanding, and ability to express themselves. Pictures were used as prompts to help the students remember portions of the curriculum. The children were asked to explain their pictures through five questions, as stated by Barlow, Jolle, and Hallam (2011).

- What is it?
- What happened?
• What did it do?
• What color was it?
• What was said? (p. 481)

I was free to reiterate questions, if that was relevant or helpful to the children’s memory.

An interactive draw-tell method was found to produce the most accurate recall in children (Barlow, Jolle, & Hallam, 2011). Additionally, the atmosphere and setting of the interviews reflected a child-centered comfort zone (Stewart, Gill, Chadwick, & Treasure, 2008).

The questions underwent a peer review process with second-grade teachers and music teachers not involved in the study. The peer review was to eliminate questions that were confusing and revise them so the data collection process yielded pertinent data (Merriam, 2009).

Table 1

*Standardized Open-Ended Interview Questions for Students*

<table>
<thead>
<tr>
<th>Questions</th>
<th>After 3 weeks/6 weeks of intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>What is your favorite part of the percussion class? What makes you like it the best?</td>
</tr>
<tr>
<td>2.</td>
<td>What is your least favorite part of the percussion class? Why do you think you don’t like it?</td>
</tr>
<tr>
<td>3.</td>
<td>Do you think you have improved in matching and doing rhythm? What makes you think so?</td>
</tr>
<tr>
<td>4.</td>
<td>Do you think your reading has gotten better the last 3/6 weeks? What makes you think so?</td>
</tr>
<tr>
<td>5.</td>
<td>How do you feel after the percussion class is over? Do you feel different on the other school days?</td>
</tr>
</tbody>
</table>
I anticipated the Table 1 interview questions with the students would reflect a growing awareness of music and literacy, and that the students would report greater gains in their reading process (Bolduc, 2008; Bond, 2012; Standley, 2008). Furthermore, I expected the students would describe a more positive attitude toward school in general and less stress in their personal and classroom life on the days of intervention (Sassen, 2012).

Table 2

*Standardized Open-Ended Interview Questions for Teachers*

<table>
<thead>
<tr>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>After 3 weeks/6 weeks of intervention</em></td>
</tr>
<tr>
<td>1. Please describe your students’ response to the intervention.</td>
</tr>
<tr>
<td>2. Do you think your students have improved in their musical skills? Please detail how or how not.</td>
</tr>
<tr>
<td>3. Do you think your students have improved in their literacy skills? Please detail how or how not.</td>
</tr>
<tr>
<td>4. Do you believe the program to be of help to your class? If so, please describe which elements you would be comfortable implementing and which ones would you not?</td>
</tr>
<tr>
<td>5. Please describe your students’ behavior after the rhythmic intervention has taken place?</td>
</tr>
<tr>
<td>6. Do you have any recommendation to improve the curriculum?</td>
</tr>
</tbody>
</table>

Teachers were interviewed in a personal video-taped conference that was later transcribed. Additionally, all teachers were interviewed as a group. However, they were offered the option of emailing or talking with me in person or on the phone for any other additional
thoughts. The teachers were encouraged to add anything else they felt pertinent to the questions. In Table 2, questions 1-4 asked for details about how the teachers perceived the intervention, both in their students (questions 1, 2, 3 and 5) and in themselves (questions 4 and 6). I expected that the teachers would perceive improvement (Bolduc, 2008; Bond, 2012; Standley, 2008). Teachers in early education typically perceive themselves as ill-equipped to perform musical interventions, and I expected the teachers to feel initially uncomfortable with personal implementation at a second-grade level (Bainger, 2010; Kim & Kemple, 2011; Russell-Bowie, 2009). Lastly I expected the teachers to indicate that the class was better behaved and the students exhibiting more on-task actions (Sassen, 2012).

Observations

Observations were recorded in this intrinsic, holistic case study through the use of video. Because I was the interventionist in the process, video was necessary for accurate transcripts. I utilized an observation protocol (see Appendix F) as a participant observer and watched all of the lessons to note improvement in the students and to make necessary changes to the programs. The lessons were scheduled for a six-week program, conducted two times per week.

Pictures

The students drew pictures of the rhythmic intervention class and I asked them to explain their thought process in the drawing. The art was used to more clearly understand the students’ perceptions about the intervention and literacy (Eaton, Doherty, & Widrick, 2007).

Documents

Documentation was examined on the students’ school, and particularly their reading levels, before and after the rhythmic intervention. These materials included Scholastic Reading
Inventory (SRI), Acuity, and running records. Each assessment was administered four times a year. The data were used to drive curriculum decisions for the student and class.

SRI is a research-based assessment of reading comprehension by Scholastic Press. It is designed to give universal screening to the students, provide instructional placement, and establish benchmark scores. SRI produces a Lexile score. While Lexile is not necessarily an indication of grade-level reading, it serves as a general marker of grade-level curriculum needs.

Acuity is a computer-based program by CTB/McGraw Hill. The program is designed to assess placement/progress and then assign curriculum appropriate for the students’ learning level. Acuity produces standards-aligned data in language arts, mathematics, social science, and science.

Running records, initially developed through Reading Recovery, is an assessment given by the teacher in a face-to-face, one-on-one method (Stafford, 2000). The system gives a more personal view of the student through student-level passages, comprehension, and notation of cues and miscues in the reading process. The running records utilize the Fountas and Pinnell Assessment Benchmark System.

It was expected the reading levels would improve during the processes. Some improvement should be attributed to continued reading programs in the school; however, I anticipated students, teachers, and administration would perceive more improvement in the level of the students’ reading because of the rhythmic intervention.

**Data Analysis**

The data analysis for the intrinsic, holistic case study included use of the computer software for qualitative data analysis QSR NVIVO. The software was used to examine and compare interviews and observations from the participants about the rhythmic intervention itself,
and a question/description interview with the students pertaining to their drawn pictures about the class. Moreover, the software enhanced validity and reliability in the study. The data were used to construct a case bounded by the time-line of the rhythmic intervention with the inclusion of contextual factors pertinent to the case (Yin, 2014).

Data were analyzed using the qualitative analytic software QSR NVIVO. It provided a more readable transcript and allowed for easier removal of redundant words and measurement of themes while allowing simpler insertion of quotations (Moustakas, 1994). To ensure a thick description, the case study followed a 60%/70% words from the participants and 40%/30% researcher commentary or interpretation (Creswell, 2013). These numbers described the proportion of case narrative versus case analysis in the study. The goal was to give emphasis to the participants in the case study to speak out about the event.

Interviews and observations were transcribed and recorded for reoccurring themes or categories. The transcriptions revealed an “extensive description of the case and its context” (Creswell, 2013, p. 237). Stake (2005) described case as a “quintain” (pronounced kwin’ton), an object or phenomenon or condition to be studied—a target, but not a bull’s eye” (p. 6). As the data were collected, issues emerged and were tied into the research of others in the field of reading, music, brain-function, and special needs.

The production of pictures of the event allowed young children a greater opportunity to express what they perceived about the intervention. Additionally, I looked for a reoccurrence of themes in the art. I believe this was of importance due to the age of the participants. The specific questions were research-based to best help children recall events (Zimmerman, 2012).

Furthermore, the interviews and observations were supplemented with identification of a range of responses. Enumeration indicated the frequency with which a statement was made, and
it added a timeline element for increase or decrease of a statement. Peer debriefing and member checks each served as an element of quality-assurance, both from a professional and participant viewpoint. I presented assertions either validating the program or showing its ineffectiveness. Finally, I utilized selected quotations that mirrored the developed themes to articulate the meaning (Creswell, 2013).

The combination of the observations, interviews, documents, and student art fulfilled the requirements of triangulation. Yin (2014) defined triangulation as “the convergence of data collected from different sources, to determine the consistency of a finding” (p. 241). A rigorous analysis of multiple sources and their convergence is considered one of the strongest of validation strategies in qualitative research (Creswell, 2013; Merriam, 1998, 2009; Stake, 1995; Yin, 2014). All of these together exceeded the requirement for triangulation of data for a valid qualitative research project.

**Trustworthiness**

This study demonstrated trustworthiness through credibility, transferability, dependability, and confirmability.

**Credibility**

Credibility included persistent observation at the site (Creswell, 2013). I made a strong effort to build a meaningful relationship with all participants to gain insight into their perceptions of the intervention. Triangulation of data, peer review, and member checks of the research was performed (Merriam, 1998).

**Transferability**

I assured maximum transferability through a thick descriptive narrative and direct quotations from participants (Creswell, 2013). The thorough portrayal of the phenomenon
allows possible applications in similar environs. Furthermore, it allows extrapolation of research for further development.

**Dependability**

I monitored dependability and checked for consistency with the data collected by the researchers and external auditor (Merriam, 2009). Additionally, I shared the collected data with stakeholders in the research to ensure reliable transfer of the essence of the phenomenon.

**Confirmability**

To ensure confirmability, I utilized an external auditor not connected with the research to ascertain the conclusions reached from the data (Creswell, 2013). Furthermore, an external auditor did not come to the project with the same biases or expectation, and therefore, I expected them to delineate false conclusions.

Qualitative research by its nature is “holistic, multidimensional, and ever-changing” (Merriam, 2009, p. 213). This case study involved a small number of participants with a constructed curriculum. However, reliable observation can be made for this individual phenomenon or case through rigorous adherence to trustworthy tenets.

**Ethical Considerations**

This study used an ethical approach exhibiting concern for the dignity, rights, well-being and safety of all participants (Walker, 2007). After securing permission from the IRB (see Appendix G), informed consent and assent were obtained from all participants. Participants were informed of their right to withdraw from the study without any repercussions to themselves. Pseudonyms were utilized for the participants and the site to protect identities. Also, composite profiles were developed for participants to protect their identities (Creswell, 2013). Real care was used to protect the identities at the local level. While the general reader may be unable to
deduce the participants, local residents and members of the education community may be vulnerable (Merriam, 1998).

Diener and Crandall (1978) noted the ethical concerns of bias in qualitative research. “Biases that cannot be controlled should be discussed in the written report. Where the data only partly support the predictions the report should contain enough data to let readers draw their own conclusions” (Diener & Crandall, 1978, p. 162). Finally, data were protected by using passwords and locked cabinets, as was appropriate for the type of data.

**Summary**

In this qualitative study I used an intrinsic, holistic case-study approach reflecting disability theory and critical realism to examine how a rhythmic intervention affected literacy in second-graders at risk for failure. I used the questions to investigate the perception of the students and teachers involved in the 12 session intervention with 10 rhythmic-based elements. I interviewed the participants and transcribed their reflections to evaluate for themes. Data collection included interviews, pictures drawn by the students, documents, and observations. I analyzed the data using the qualitative analytic software QSR NVIVO. I demonstrated trustworthiness through credibility, transferability, dependability, and confirmability. I upheld ethical standards through IRB approval, informed consent and assent, pseudonyms, composites, locked or password protected data, notation of bias, and member checks by participants.
CHAPTER FOUR: FINDINGS

Overview

The purpose of this intrinsic, holistic case study is to describe and analyze the experience of second-grade students at-risk of literacy failure of state mandated reading tests utilizing a rhythmic intervention. Chapter four records methods of data collection and analysis of the data. More specifically, study participants, both students and teachers, are described. Students are at least one year behind the expected second-grade reading level; teachers have two or more of the students in their classrooms. Rhythmic intervention observations, interviews with students and teacher participants, drawings by the students, and academic documentation are used as collected data and are analyzed through QSR NVIVO software. The themes are developed through pattern coding which looks for repetition in comments, behavior, and in this case study children’s artwork (Miles, Huberman, & Saldana, 2014). In this chapter the five emerging themes are discussed including attention, confidence, connection, interventionist, and curriculum. Lastly, students’ data and the themes are related to the three research questions framing the study.

Participants

The participants in this study included four teachers and nine students from East Elementary School second-grade. Each of these individuals participated either as a general education teacher or as an active participant in the rhythmic intervention. The teachers were interviewed individually twice and as a group once; the students were interviewed twice individually.

Furthermore there is a “conflict between conveying detailed, accurate accounts of the social world while simultaneously protecting the identities of the individuals who live in that particular social world” (Kaiser, 2009, p. 1639). To resolve the dilemma of deductive disclosure,
composites were used for the participants (Creswell, 2013; Kaiser, 2009; Merriam, 1998).

Deductive disclosure is the ability to identify a participant from characteristics revealed in the research even though names, places, and other details have been removed. The composites of the participants are truthful with attention to detail to accurately describe the lives and experiences of these individuals. However, the composites are a compilation of interviews, conversations, and observation of the rhythmic interventions. I made every attempt to give a vivid and detailed description of the participants while maintaining their anonymity. All names are pseudonyms, and while details were accurate, they were not necessarily reflections of the stated pseudonym. Details were spread throughout the descriptions to prevent deductive disclosers.

**Second-Grade Teachers**

The principal at East Elementary School was supportive of the project and willing for the intervention to take place. Additionally, the principal along with the school secretaries were all mindful of the program and its needs. This was reflected in the efforts made in rooms for the intervention and storage of the supplies. Moreover, the school gave full cooperation on records and additional information as needed. Furthermore, teachers who had the students for other pull-outs were very gracious to let the intervention come first in their schedule.

All the second-grade teachers in East Elementary School agreed to be a part of the research project. However, one teacher did not have students who qualified for the program. The intervention required the participants to be one year behind in reading. Her students were all above that benchmark. The other three second-grade teachers agreed to be part of the research. One of the teachers was particularly helpful in securing participants for the intervention.
Each of the second-grade teachers at East Elementary School was experienced and well-qualified in their fields. They had a combined total of 82 years of experience with one holding a master’s degree. The group consisted of all Caucasian females. It was clear the teachers were friends and supportive of each other as peers. The group was given time to collaborate and plan as a group. However, when asked if this was helpful, one teacher responded the time was generally spent with analysis of assessment and data rather than meaningful group collaboration.

As individuals, each of the teachers was passionate about teaching and genuinely cared for their students. Moreover, all expressed superior knowledge on the education of students in each subject but in particular reading. The teachers reflected this in conversation, in class discipline, and materials for students. They were knowledgeable about students with disabilities and learning problems and expressed themselves well in researched-based approaches. Additionally, every teacher stated their frustration with a system that emphasized data over personal interaction with students. They wanted to spend time helping their students versus excessive high-stakes testing.

**Lisa.** Lisa is a teacher with 10 years of experience. She has a degree in journalism with the addition of a teaching degree. Her room is filled with literacy elements with small stations for group work. While Lisa signed the consent form, none of her students met the qualification of one year behind in reading with the exception of a transfer student recently in the school. Lisa stated that several of her students would have qualified at the beginning of the year, but they had made good progress in their reading skills. While it was evident Lisa was proud of her students and the hard work from not only herself but them, she also acknowledged the challenges of summer reading loss and its effect on reading the next year. Moreover, she was concerned these
students, presently considered on level, would be able to pass the state-mandated reading in third-grade. Finally there was a sense of relief that all her students had passed this benchmark.

**Mary.** Mary is a teacher with 26 years of experience. She has a degree in elementary education. Mary is a small active woman with a bubbly personality. She has an aide in the classroom to help with a student not in the intervention. Her room is well-organized with several stations for learning. Mary went to great lengths to find students to participate in the study. She actively recruited students and was very positive about her students’ participation in the study. This was her last year before retirement.

**Karen.** Karen is a teacher with 20 years of experience. She has a degree in elementary education. Karen is a tall active woman with an interest in activation of the brain before learning. She is knowledgeable about the fundamentals of reading and its practical application with students. Karen has two learning stations in the room itself with an additional space designed to facilitate reading in a separate but connected small room. This room had comfortable seating, table, and literacy materials. Moreover, I observed her taking running records on her students. While a passionate teacher, Karen did not encourage her child to become a teacher because of the growing challenges in the teaching profession.

**Kimberly.** Kimberly is a teacher with 26 years of experience. She has a degree in elementary education and a master’s in education. Kimberly is a small energetic woman with great time utilization. She has a very calm demeanor with her students, and she allowed movement by the students in a controlled manner. For example, if a child worked best standing beside their desk, this was allowed. Additionally, she used music as a tool for student participation, discipline, and as a mood enhancer for her classroom. Kimberly constructed two literacy stations just outside her door in a small alcove. It contained reading materials, prompts
for writing and art materials. Kimberly utilized the personal writing and artwork of her students to good effect as classroom décor.

Table 3

*Teacher Participants*

<table>
<thead>
<tr>
<th>Name</th>
<th>Race</th>
<th>Education</th>
<th>Years Teaching</th>
</tr>
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<tbody>
<tr>
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<td>10</td>
</tr>
<tr>
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<td>BA</td>
<td>26</td>
</tr>
<tr>
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<td>BA</td>
<td>20</td>
</tr>
<tr>
<td>Kimberly</td>
<td>Caucasian</td>
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</tbody>
</table>

*Student Participants*

The protection of the student participants was a primary consideration. Information was selected that would “benefit the community under study” rather than the simply the thickest description possible (Hopkins, 1993, p. 123). I used pseudonyms for all of the student participants. I selected names using the most popular names for 2007 that reflected ethnic choice through a google search (http://www.babycenter.com). The students came from three of the four second-grade classrooms; however, I did not cite specific teachers to protect the participants’ anonymity. Additionally, I have made some detail composites to further protect the student participants’ identity.

The initial goal of the case study was for 15 at-risk second grade students. When I examined the records for qualifying students, only 15 students were found. Nine of the students and their parents/guardians agreed to be participants. The other six did not participate for various reasons including inability to contact parents/guardians through repeated phone or mail,
disinterest in the project, and a concern the time away from class would affect the behavior or academics of their student.

The student participants in the rhythmic intervention were unfailingly happy to be a part of the program. They were quick to remind of details and helpful in returning materials to the storage room. The students themselves varied in literacy needs. While a few had been diagnosed with a learning disability, most were considered slower in reading. Several were involved in Response to Intervention (RTI). There are three layers of RTI in the school system. Tier one is for the general education students and most students are in this category. Tier two students receive small group interventions and more frequent monitoring of reading levels. Tier three is considered a pre-cursor to a learning disability diagnosis. They may receive one-on-one interventions with more frequent monitoring of reading levels.

**Cody.** Cody is an attractive child. He is small in stature and has an easy going nature. While his teacher stated he needed to move, he had excellent behavior in the intervention and was helpful with details in the class. Additionally, he was a good line leader.

Cody came from a large family with a single-mother. His father was in his life. Several of his siblings had been diagnosed with learning disabilities, attention deficit hyperactivity disorder (ADHD), mood disorder, and depression. Cody was diagnosed as a child with a Developmental Delay and Language Impairment before he was three and received early childhood education. His mother requested he be tested for a disability this school year, but he qualified only in the area of speech impairment. Cody was not hard to understand in conversation; he received speech therapy through the school.

Additionally, Cody received Tier two interventions in math and reading and attended bilingual class although English was spoken in the home. Cody’s Wechsler Individual
Achievement Test Fourth Edition (WISC-IV) results showed him in the average range in all areas except decoding which was just into the below average range. His first and second grade teachers both stated “Although Cody is quiet he puts forth lots of effort, is highly motivated to do his best, and has a great attitude.”

**Cameron.** Cameron is a handsome child with a winning smile. He was an active participant in the intervention and enjoyed the class and his classmates. Cameron is well-liked by his classmates and a leader in the intervention.

Cameron had struggled in school. He received Tier two and Tier three interventions especially in the area of reading comprehension, decoding, and phonemic awareness/phonics.

**Ethan.** Ethan is an easy-going child who can be easily distracted. He has a noticeable speech disorder for which he received help through the school. Ethan was understandable. His teacher had taught his older brothers, and they did well in school. Ethan had struggled. His teachers in both first and second grade did not feel he put forth his personal best effort. In the rhythmic intervention, I would periodically need to remind him to try the skill being taught. If Ethan did not feel immediate success, he would stop trying the skill.

**Jacob.** Jacob is a tall student who repeated first grade. He enjoys individual attention and liked to take the lead in a group or one-on-one. For example: Jacob liked to lead the group with the drums but did not like others joining in with him. He stated he did not like the noise factor.

Jacob was diagnosed as a student with Developmental Delay and Language Impairment. He attended pre-school. Jacob’s scores on the WISC-IV suggested overall measurability within the Low Average Range. He did score Average in Verbal Comprehension and Perceptual Reasoning. Jacob’s Working Memory fell well below average. He did well in mathematics but
was considered a non-reader. Jacob did well on reading comprehension questions if the material was read to him or was on his level.

Jacob had a behavioral plan at the school, took medication for ADHD, and saw a mental health specialist. The behavioral concerns included: hyperactivity, outburst in the classroom, and oppositional attitude. While Jacob missed one intervention because he was having problems that day, he displayed little of these characteristics in the class.

Michael. Michael is a quiet child with a sweet disposition. He was retained in first grade, although, he received extensive pre-school help. Michael was a premature birth at seven months with initial breathing problems. He was delayed in development and more than the normal few months. On the Wechsler Preschool and Primary Scale of Intelligence Third Edition (WPPSI-III), Michael scored in the Average range; however, there was a large discrepancy between his Verbal and Performance Scores. His Verbal scores were lower.

Michael needed to be encouraged to participate in the rhythmic intervention on things he found more difficult. For example, Michael needed to be encouraged to try the hand-clapping routines. He appeared to enjoy them when he felt confident of his abilities. His last two teachers noted an apparent lack of his best effort.

Academically, Michael did better in mathematics than reading. His reading was at a first grade level.

Gabriel. Gabriel has a smaller slight frame but was an energy producer. He was the student in the rhythmic intervention with plans to be a drummer. Gabriel enjoyed the class immensely but could be distracted by his own thoughts. He was always one of the first to come up with any unusual way to demonstrate a concept.
Gabriel was in Tier two and Tier three interventions. His teacher stated, “Gabriel is a puzzle to me. He is smart but seems to process things slowly or in a different way. I don’t think he has attention problems as much as processing difficulties.” His goals in RTI included comprehension and fluency. Gabriel’s records repeatedly noted his problems with attention. This was also demonstrated in the rhythmic intervention.

Mia. Mia is a tall pretty girl with a sweet demeanor. She liked to be the leader and enjoyed books. She was the student who wanted to borrow several of the books read in the intervention. Mia was allowed to take them home and was careful to bring them back. Her teacher described her as a “collector” of books but unfortunately this was not reflected in her reading ability.

Mia did attend pre-school and had a family interested in her success. She repeated kindergarten. She was reading on a first grade level. Mia was particularly interested in the hand-clapping exercises and was really good at them.

Isabella. Isabella is a tall pretty girl with lovely eyes. Even though she attended pre-school, Isabella repeated kindergarten. She seemed to struggle in all areas of school. In the rhythmic intervention, she loved to demonstrate the hand-clapping and draw rhythm for the other children to perform. Isabella was most insistent on her fellow students echoing her patterns in the exact way she performed them. It was more than rhythm that needed to be copied; it was style.

Jada. Jada is of slight stature but possesses a sunny and outgoing personality. Jada was a true joy in class. Her abilities especially in the hand-clapping were exceptional. We talked about her trying cheerleading, and Jada said her Dad was going to let her do that in the summer.
Jada had been in three different school systems and had an Individual Education Plan (IEP) with a diagnosis of a specific learning disability. Her Woodcock Johnson Tests of Achievement Third Edition Normative Update (WCJ III NU) demonstrated much stronger overall Oral Language and Math skills than overall Reading and Written Language skills. Jada received special education services for this disability daily.

Table 4

*Student Participants*

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Race</th>
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**Results**

The results section is based on interviews with students and teachers, observations of interventions, pictures drawn by the students, and academic documents on the student participants. The interviews were conducted in person, recorded, and transcribed. Each student participant was asked the same five open-ended questions at week three and week six. Additionally, students answered five questions on their drawings based on Barlow, Jolle, and
Hallam’s (2011) interactive draw-tell method which was found to produce the most accurate recall in children. The teacher participants answered the same six questions at week three and week six, and were given the opportunity to read and approve the transcripts.

The interventions were video-taped for later written observations. Because the interventionist was also the researcher, video-tape allowed for a more objective and more focused observation. Additionally, reflections were written after each intervention within a few hours to reveal initial impressions both negative and positive (see Appendix H). These reflections affected the movement and curriculum selections for the next intervention.

Moreover, students drew pictures that showed their view of the rhythmic intervention. They answered five questions based on an interactive draw-tell method proven to help children recall events (Barlow et al., 2011). Seven of the nine students chose to participate in this portion of the research. The descriptions the children gave of their own drawing elicited the most robust conversation about their personal perception of the rhythmic intervention.

Lastly, academic documents were collected to better describe the students and demonstrate progress in reading. These materials included the IEP if applicable, RTI notes, progress reports, and reading assessments. Parental/guardian permission was obtained to view all materials.

After transcription, all elements were analyzed through the qualitative analytic software QSR NVIVO. Five themes developed in the analysis of the case study: Attention, Confidence, Connection, Interventionist, and the Curriculum (see Appendix I). Each of these themes repeatedly occurred in interviews with students and teachers, interventions, and researcher reflections. I anticipated a critic of the merits of the program as a musical/reading intervention; however, the participants viewed the program differently. They were more interested in the
intrinsic elements the intervention brought to the students or themselves and valued the program for those reasons.

While overall, the teacher participants did not feel the program affected literacy in their students, they did feel it was a positive element in the students’ curriculum. They believed the program of value because of the extra attention and the resulting benefits from added intervention to their students. Furthermore, they were interested in more of the program in time, content, and access for all their students.

The students were universally supportive of the program and wanted to do it again next year. The student participants’ enjoyment of the program was directly tied to each of the five themes. The students clearly demonstrated their desire to be a part of the program, the companionship with the other students, and seeing me each time. They were interested in the various elements of the intervention and loved being able to give their ideas and implement those changes to the curriculum.

**Theme One: Attention**

Attention was an element mentioned by all of the teacher participants and demonstrated in the actions and words all of the student participants. The theme of attention was noted 32 times. I defined attention for this case study as one-on-one or small group care over a whole classroom situation. Small group activities have been shown to increase students’ learning (Hunzer, 2012; Serravallo, 2010; Wasik, 2008). The number one thing mentioned as a success of the interventions was the time given to the students. The teachers repeatedly stated the more attention the children could receive the better they did in class.

The final group interview yielded the following exchange between the teachers after I asked if the intervention was of use to their class.
Mary: Like I said before, anytime you can get those kinds of kids one on one or in smaller groups.

Karen: Actually what you do is helpful. To them and to us.

Kimberly: And just getting out of the room, I think.

Karen: Those kinds of kids need to move. And they liked the individual attention. They need a lot of attention (Group, Week six interview, June 4, 2015).

The teachers also continually mentioned how much the students looked forward to the class. The final group interview noted.

Karen: Mine couldn't wait to go, even during the movie, and they kept calling for you.

Kimberly: My kids were happy to go. So much they had to remind me, today's Tuesday. And I'm going at 11 or at that time. Thank goodness you remember because you know I don't. They knew when it was their day (Group, Week six interview, June 4, 2015).

Moreover, in the individual interviews with the three second-grade teachers the need the children have for more attention than the individual teacher can give was mentioned several times. Mary stated the following in her three week interview.

Mary: They definitely talked a lot about it but I just haven't had time to say, so what are you doing out there. Are you enjoying it, whatever? So they have not talked to me about it. They do seem happy when they come back. It's not like they're grumpier, or poutier before. So it seems like they've had a good time at whatever you've done.

Mary: Sure anytime to get out of the room they don't care what it's for I guess (Mary, Week three interview, May 21, 2015).

In her six week interview, I asked Mary again about her students’ response to the class.
Mary: They really enjoyed going nobody ever liked or baulked or any excuses so I think they enjoyed it (Mary, Week six interview, June 5, 2015).

In her three-week interview, Karen noted the following when asked about her students’ response to the class.

Karen: They're excited to go. They like to get out of here [pause.] They seem to have a good time (Karen, Week three interview, May 14, 2015).

However, there was an unusual case Karen noted in her six-week interview.

Karen: But I will say something. I know one girl, Jada, goes to Special Ed for a while. She doesn't like to leave my room. She likes to go to your room (Karen, Week six interview, June 8, 2015).

Furthermore, Karen made several more references to the positive effects of attention given by the program.

Karen: Yeah. When you pull them, they're kind of happy to get out of here, its new turf for them. Here, I try to help them, but basically they have more success in a small group than they would in a regular classroom. They're always happy to get out.

Karen was asked if she thought the program was effective in her classroom.

Karen: Yeah, I think anything that affects is of help to them (Karen, Week six interview, June 8, 2015).

Kimberly stated the following in her three week interview.

Kimberly: They are really excited to go. They look forward to seeing you, and doing whatever it is you're doing there.

Kimberly: I think so, because it gives them time to be a little more one-on-one in a smaller group setting, so yes. I think any extra help that they're given is a bonus to me. I don't think they're
going to be changing the world in seven weeks, but you're just giving them a little bit of extra something (Kimberly, Week three interview, May 21, 2015).

In her six week interview Kimberly had a similar statement.

Kimberly: Okay, they enjoyed it. They looked forward to going. They knew when you were coming, when you weren't coming. I think overall they loved getting out of my room (Kimberly, Week six interview, June 5, 215).

Furthermore while the students did not state specifically the benefit of attention as a benefit, they did note their personal enjoyment of the class.

Interviewer: What is your least favorite part of the rhythm class?

Jada: When we got to go.

Interviewer: When you got to go? All right, that's so sweet. So you like going to the class?

Jada: I want to go there every day.

Interviewer: How do you feel after the rhythm class?

Jada: Sad.

Interviewer: Oh, why are you sad?

Jada: Because I don't want to leave (Jada, Week six interview, June 4, 2015).

These statements are particularly significant with Karen’s statement that Jada did not like to leave her classroom.

Mia in particular mentioned twice how much she like the positive affirmation in the class.

Interviewer: What is your favorite thing in rhythm class?

Mia: hmm when we get to do the hand moves.

Interviewer: We have a new one: “Bitty bitty bum bum” (Mia doesn’t remember the song, so I sing it for her). You're so good at “Double This That” too. Okay why is it you like those?
Mia: Because you tell me I do a good job (Mia, Week six interview, June 4, 2015).

Five of the 12 intervention reflections and observations cite the need or the seeking of attention by the students. By the time intervention seven was performed, I noted attention as a possible theme.

Furthermore, attention is a clear element in the interviews with the teachers. It is their number one motivation for supporting the program, and it is the reason they believe it to be of value to their students. The students stated how much they enjoyed the program both in their personal interviews and in the reflections from the interventionist. Research notes the importance of a students’ enjoyment of their class as a motivating factor in their improving in academics and in classroom behavior (Degener & Berne, 2014; Marchard-Martello et al., 2015; Noltemeyer et al., 2013; Weiss, 2013)

**Theme Two: Confidence**

Confidence in the classroom setting is an important element for student success. An individual needs to believe they can succeed to see the greatest growth in learning (Demirdag, 2015; Favazzo et al., 2014; Matthias & Hessling, 2009). Mok (2013) noted the importance of self-confidence in his book on self-confidence case studies. Higher levels of confidence were correlated with higher grades. Additionally, higher grades were given by teachers when children felt they did well in the activity. Both of these factors remained after being controlled for gender, school-fees, age, intelligence, and other significant influences (Mok, 2013).

Likewise, self-esteem in students with disabilities plays a key factor in their success. A child’s self-confidence can have a greater effect on a child than remedial intervention (Cheng, 2015). Self-efficacy, defined as how a student feels about their academic abilities, specifically affects students with disabilities (Bergen, 2013; Ju et al., 2012; We & Marder, 2012). This effect
is noted in early elementary grades and predicts future academic achievement (Ju et al., 2012).
By intervention eight, I noted confidence could be a theme of the case study.

Furthermore, when students with disabilities learn from another peer, they are more likely to believe they can do the activity than if it is demonstrated by a teacher (Bergen, 2013). This was demonstrated in the hand-clapping portion of the intervention in particular. As observer, I noticed the students were very proud of themselves for learning the first one so well.

The girls were especially fond of the hand-clapping portion of the program. Jada was very good at learning and remembering the words and actions. The girls would get together and practice between interventions.

Interviewer: Do you think you have improved in matching and doing rhythm?
Jada: Yes.

Interviewer: Great. What makes you think that?
Jada: Because me and Mia did it outside of class.

Interviewer: You were awesome on that (“Double This That”). You worked on that outside of class? Good. You have the “Biddy biddy bum bum” down, but that was a hard one too, but somebody said to me they didn’t like it as well because of the solo thing?
Jada: Yeah.

Interviewer: And they liked doing it (“Double This That”) because they were supposed to do it with a partner.
Jada: I do too because you got to do this.

Interviewer: Right (Singing together) Biddy bum bum, bum biddy biddy bum, biddy bum, biddy biddy bum, bum, bum. But you’re not doing it with somebody. It’s just you and me doing it.
And we're not doing it off of each other. We should try to figure out something to make that work. That would be kind of fun (Jada, Week six interview, June 4, 2015).

Mia was asked if she had improved in matching and doing rhythm in her three-week interview.

Mia: Yes, I was showing my brother the double this double that that. He said that was kind of hard.

Interviewer: How old is your brother?

Mia: Seventeen.

Interviewer: You're better than your 17-year-old brother?

Mia: Yes!

Interviewer: Wow! So you're saying that you improved by being able to do the handclaps?

Mia: Yes (Mia, Week three interview, May 14, 2015).

Mia mentioned the same example in her six-week interview. She felt real pride in being able to do something her older brother could not. Moreover, I noted this in the reflected attitudes of the children toward certain elements of the intervention. If they felt self-confident in their abilities, they tried that activity without encouragement and repeatedly asked to do it.

Kimberly was the one teacher who took advantage of the books available to be used in the general classroom. She read The Jazz Fly with her entire class. This book utilized a CD with recorded reading and music. She made the following statement about the students in her class.

Kimberly: And he kind of perked up when I said we were going to do it as a group. Right away it was something that he was familiar with, where he struggles all the time. He was real excited about it. I know this book. Where Jacob sat covering his ears going, ‘I've already heard this. I've already heard this.’ So he wasn't as open as the other kids. Who else do you have?
Interviewer: Cameron and Cody were there.

Kimberly: Yeah, Cameron did the same thing.

Interviewer: And Michael.

Kimberly: But Michael, the same thing. And Cody, who is usually pretty quiet, was really excited. I know this book. I like this book. And for some reason it made Jacob kind of angry. I'm not sure why (Kimberly, Week six interview, June 5, 2015).

Studies reveal students also responded to the confidence reflected by their teachers (Atta et al, 2011; Shaunessy & Mchatton, 2009; Siegle et al., 2014). These teachers felt confident in their materials and were not afraid to stray off the given curriculum. They also knew their students well and had meaningful discussions with them (Oades-Sese, Matthews, & Lewis, 2014; Osler & Nichols, 2013; Siegel, Rubenstein, & Mitchell, 2014). Furthermore, positive teacher beliefs lead to greater student self-esteem, sense of belonging to the school, and academic achievement (Farrelly, 2013; Lee & Bierman, 2015; Pasto, 2014).

Interviewer: What is your favorite part of the rhythm class?

Isabella: Hmm when we get to do the hand moves.

Interviewer: We have a new one: bitty biddy bum bum. (Isabella doesn't remember how the bitty bum goes; I sing it for her.) You're so good at Double This That too.

Okay why is it you like those?

Isabella: Because you say I do such a good job. (Isabella, Week 3 interview, May 14, 2015).

Moreover, students’ confidence in doing one thing well led to an easier acceptance of a new piece in the intervention. However, they continued to ask to do the first hand-clap in every intervention. The first hand-clapping rhyme was an activity which required two students. They
enjoyed connecting with each other in the hand clapping; additionally, they wanted to excel in the activity.

Theme Three: Connection

Peer relationships are an important part of a student’s self-esteem. Students with positive peer relationships do better in school and in society (Cheng, 2015; Park & Park, 2015). Additionally, students with learning disabilities friendships are not as numerous or robust (Wong & Butler, 2012). From the first lesson, the connection with the students seemed to be strong. Moreover, the children noted it in their interviews.

Interviewer: What is your least favorite part of the rhythm class?
Jada: When we got to go.

Interviewer: When you got to go? All right, that's so sweet. So you like going to the class?
Jada: I want to go there every day (Jada, Week three interview, May 21, 2015).

Interviewer: What is your favorite part of the rhythm class?
Cody: That we all are together.

Interviewer: That's so sweet. You all get together. I'm going to get close to you because you're kind of soft spoken (moved computer closer for recording). What makes you like it the best?
Cody: I like the group.

Interviewer: You're the second person that said that. They really like the group. I like our group of kids. They're a lot of fun.
Cody: Yeah.

Interviewer: So it's nice to be together. What is your least favorite part of the rhythm class?
Cody: That we don't [pause] it's only on one day (Cody, Week three interview, May 14, 2015).

Cody also repeated this in his six week interview.
Interviewer: What is your favorite part of the rhythm class?

Cody: That we all got together.

Interviewer: Because you all got together? That is very nice. What makes you like it the best? What part of getting together do you think is so great? There were 4 of you in the same classroom. We had 5 from other classrooms. Did you know those kids before?

Cody: Yes.

Cody: You did. Great.

Interviewer: What is your least favorite part of the rhythm class?

Cody: That we only did it two times a week.

Interviewer: Only did it two times a week? You wanted to have it more times a week was your thing? [Nods]Okay (Cody, Week 6 interview, June 4, 2015).

Interviewer: Okay, so, how do you feel on the days that you have percussion? When we have percussion, how do you feel afterwards?

Michael: Good.

Interviewer: Good? Do you feel any different on the days that you don't have the percussion? Okay, well tell me how you feel differently?

Michael: When I get to do more, I feel better. We do different things together. I like that we all do a lot of stuff.

Interviewer: We have a good group of kids, don't we? I like that group of kids (Michael, Week 3 interview, May 14, 2015).

Connection was also demonstrated in all of the pictures drawn by the students except one. Each student drew several other children in the picture. Jada drew every child in the intervention.
Interviewer: How do you feel after the rhythm class is over?

Jada: Sad.

Interviewer: Do you feel different other days of the week?

Jada: Yeah. Cause I know I can't go to your class.

Interviewer: You are so sweet. I need to bottle and sell you, so I can have you for all my other kids be as sweet as you.

   All right, now, I love your picture. Each one of you've been so very different. That's what's been fun about it. What I want you to tell me is, what's going on right here? Do we have everybody? One, two, three, four, five, six, seven, eight,. . . Got all of you. Tell me about the picture (Jada, Week 6 interview, June 4, 2015).

   The teachers, individually and as a group, mentioned the importance of connection between the students.

Interviewer: Describe your kids' response to the interventions. Before, after, what they ever said about it

Mary: Well, some of them get pulled for another reading class.

Interviewer: Right.

Mary: So they're kind of used to getting pulled. And Ethan gets pulled for speech also.

Interviewer: Yeah, I noticed his speech intervention.

Mary: Yeah. When you pull them, they're kind of happy to get out of here, its new turf for them. Here, I try to help them, but basically they have more success in a small group.

Interviewer: Right.

Mary: Than they would in a regular classroom. They're always happy to get out.

Interviewer: That's actually a really good point.
Mary: Yeah.

Interviewer: Kimberly said something similar, that the kids I pull are needy children.

Mary: Right.

Interviewer: To take that little extra while teaching is helpful. Also the novelty of the program affects, who can say, oh yes, this is really effective. Well, is it really effective or it's just the novelty of getting out of the classroom? Kids perk up, and they pay more attention (Mary, Week three interview, May 21, 2015).

The six week interview with the group of second-grade teachers contained the following exchange.

Interviewer: Do you believe the program to be of help to your class? Outside of saying that you think that longer would have given you a better perspective? Were there points of it that you thought were helpful or just simply having them get out of the class for a day?

Mary: Well, when you have 25 kids and you get rid of three . . .

Kimberly: Like I said before, anytime you can get those kinds of kids one-on-one or in smaller groups . . .

Mary: Actually what you do is helpful. To them and to us.

Karen: And just getting out of the room, I think.

Mary: Those kinds of kids need to move. And they liked the individual attention. They need a lot of attention.

Kimberly: Even when they were reading it gets better when you try to teach the whole class.

Interviewer: One of the things that the kids said that they liked . . . I forget which one it was, who said they liked being with the other kids. I'm just like the ones in your classroom or some of the
others? But they like being with the whole group. They had known those kids from before, so they felt comfortable with them (Group, Week six interview, June 4, 2015).

**Theme Four: Interventionist**

While positive teacher-student relationships have been shown to be a consistent factor in students’ success both academically and socially, students with learning disabilities specifically “continuous teacher support could counteract or neutralize risk factors, leading to lasting positive effects on children’s development that cannot be attained by one or two years of a supportive relationship” (Bernstein-Yamashiro & Noam, 2013; Spilt et al., 2012, p. 1180). At-risk students do better with teachers who believe the children can succeed and believe the children are attempting to learn (Wong & Butler, 2012). Furthermore, a positive relationship was particularly important for minority groups with African-American males most affected (Spilt et al., 2012). Moreover, positive teacher feedback was associated with higher achievement in the classroom (Wong & Butler, 2012). Likewise, Alderman and Green (2011) list likeability as one of four main areas to improve student performance.

The fourth theme of interventionist included the personality of the interventionist and its impact on the program. The theme of interventionist was noted by all three of the teachers individually and as a group, several of the students, and in intervention reflections.

**Interventionist: Please describe your students' response to the intervention. How do they act about going to it, coming back? What do you think?**

**Karen:** They are really excited to go. They look forward to seeing you, and doing whatever it is you're doing there (Karen, Week three interview, May 14, 2015).

**Interviewer: Please describe your students' response to the intervention. As much as you can tell from before and after.**
Karen: Okay, they enjoyed it. They looked forward to going. They knew when you were coming, when you weren't coming. I think overall they loved getting out of my room.

Interviewer: I guess that is one of the benefits of it being toward the end of the year.

Karen: Yes (Karen, Week six interview, June 8, 2015).

Interviewer: Please describe your students' response to the intervention. Do they talk about it at all?

Kimberly: They definitely talked a lot about it, but I just haven't had time to say, so what are you doing out there. Are you enjoying it, whatever. So they have not talked to me about it. They do seem happy when they come back. It's not like they're grumpier, or poutier before. So it seems like they've had a good time at whatever you've done.

Interviewer: They're jewels. They get a little active; they get to run off a little energy while they're there. It's interesting when I was talking with them all. I talked with six of the nine today. None of them had anything negative to say. I would tell them, “Guys really I want to know the truth.”

Kimberly: Right, that's what we say in class, it's your opinion it's okay, there's no right or wrong answer for this. It’s okay to say I didn't like this book because for whatever reason. That's what we're looking for.

Interviewer: And little Jacob was out there I said, ‘You know you're the one I thought for sure would give me something negative.’ I said, ‘Because when those drums get loud you do this.’ He said, ‘Oh that's right when it gets loud I don't really like it.’ He's an active kid but there's a point where the tone quality maybe bothers him.

Kimberly: And he might need a little prompting like that. Otherwise he's sort of I think wants to just please you and give you want he thinks you're looking for. If you sort of along the line I
notice that you cover your ears or whatever that will probably help him to express his feelings. He does see a therapist and things like that (Kimberly, Week three interview, May 21, 2015).

Interviewer: Please describe your students' response to the intervention.

Mary: They're exited to go. They like to get out of here. They seem to have a good time (Mary, Week three interview, May 21, 2015).

Interviewer: Please describe your students' response to the intervention.

Mary: Well, some of them get pulled for another reading class.

Interviewer: Right.

Mary: So they're kind of used to getting pulled. And Ethan gets pulled for speech also.

Interviewer: Yeah, I noticed his speech intervention.

Mary: Yeah. When you pull them, they're kind of happy to get out of here, its new turf for them. Here, I try to help them, but basically they have more success in a small group.

Interviewer: Right.

Mary: Than they would in a regular classroom. They're always happy to get out.

Interviewer: That's actually a really good point.

Mary: Yeah.

Interviewer: Kimberly said something similar, that the kids I pull are needy children.

Mary: Right.

Interviewer: To take that little extra while teaching is helpful. Also the novelty of the program affects. Who can say, oh yes, this is really effective. Well, is it really effective or it's just the novelty of getting out of the classroom? Kids perk up and they pay more attention.

Interviewer: You think , I know you're gonna say you don't know. Do you think your students have improved in their musical skills?
Mary: I don't know.

Interviewer: I figured you'd say that.

Mary: But I will say something. I know one girl, Jada, goes to Special Ed for a while. She doesn't like to leave my room. She likes to go to your room.

Interviewer: Oh.

Mary: I'm just saying . . .

Interviewer: She was really good at the hand clapping. I asked her if she had any cheerleading experiences and she had messed around with it some. I said, “You really should look into cheerleading.” That rhythm would help her all around. And she's just good at it. She's cute as a mischief.

Mary: Oh. She is (Mary, Week six interview, June 5, 2015).

Interviewer: Please describe your students' response to the intervention.

Kimberly: Mine couldn't wait to go, even during the movie, and they kept calling for you.

Interviewer: You guy's pictures were adorable. Oh, my gosh, the pictures are so cute.

Karen: My kids were happy to go. So much they had to remind me, today's Tuesday. And I'm going at 11 or at that time. Thank goodness you remember because you know I don't. They knew when it was their day.

Interviewer: That's really sweet (Group, Week six interview, June 4, 2015).

The students also stated that their relationship with the interventionist was one reason they enjoyed the course and wanted more of the program.

Interviewer: What is your favorite part of the rhythm class?

Mia: Hmm when we get to do the hand moves.
Interviewer: We have a new one: “Bitty biddy bum bum” (Mia doesn't remember how the bitty bum goes; I sing it for her.) You're so good at “Double This That” too.

Okay why is it you like those?

Mia: You sing it and say ‘that's good, that’s good.’ (Mia, Week three interview, May 14, 2015).

Interviewer: What is your least favorite part of the rhythm class?

Jada: When we got to go.

Interviewer: When you got to go? All right, that’s so sweet. So you like going to the class?

Jada: I want to go there every day (Jada, Week three interview, May 21, 2015)

Interviewer: How do you feel after the rhythm class is over?

Jada: Sad.

Interviewer: Do you feel different other days of the week?

Jada: Yeah. Cause I can’t go to your class (Jada, Week six interview, June 4, 2015).

Interviewer: I think we have a good group of kids, don't we? I like this group of kids. Do you feel different on, let’s see, Monday, Wednesday, and Thursday? You don't have an intervention. Do you feel differently on those days?

Michael: What's intervention?

Interviewer: The rhythm class. I'm sorry. Do you feel differently on the days that you don't do the rhythm class? (Michael nods his head.) Okay, in what way?

Michael: I guess I'm sad because I don't see you (Michael, Week three interview, May 14, 2015).

Interviewer: What is your least favorite part of the rhythm class? And it’s okay to have a least favorite part.

Isabella: I don’t have one.
Interviewer: (Laughs) Ya’ll kids are so sweet to me. Do you think you have improved in matching and doing rhythm?

Isabella: I think a little bit. What does that mean?

Interviewer: Do you think you got better?

Isabella: Yes.

Interviewer: Okay, what makes you think you got better?

Isabella: Hmmm from you teaching me (Isabella, Week six interview, August 7, 2015).

The intervention reflections specifically noted from the first intervention the enjoyment the children had in the class. Additionally, the last intervention cited the students wanting the program next year. The children were clear in their personal pleasure in seeing me each time.

**Theme Five: Curriculum**

The importance of an engaging curriculum for students to learn has been proved by a wide-range of research (Christenson et al., 2012; Schlechty, 2011). I based the curriculum for the rhythmic intervention on principles established in Dalcroze, Kodály, Orff, Tataku, and research-based reading instruction (Findlay, 1971; Frazee, 1987; Houlehan & Tacka, 2008; Kalani, 2005, 2008; Kelly, 2012; Matney, 2008; Mead, 1994; Montgomery, 2012). Materials included appropriate literature, drum sticks, buckets for drums, metronome, same or different signs, balls, and use of audio visual materials.

The students were universally positive about the curriculum. The girls particularly liked the hand-clapping rhymes, and the boys varied between the balls or beating the buckets as favorites. The pictures drawn by the students showed students passing soccer balls, drawing rhythm, hand-clapping, playing the drums (buckets), and using the metronome to match beats.
The students also liked to have a say in how the rhythm was done in each intervention. While they would follow the general outline of the lesson, the students were given choices about how to implement various activities. It was evident early in the research this choice factor contributed to their enjoyment of the lesson (Beaton, 2010; El-Sherif, 2014; Romano, 2014). They participated better when they had a say in the lesson.

The teachers were in agreement that the intervention did not help their students learn to read better; however, they were interested in giving the curriculum more time to succeed. Moreover, they were interested in what was in the curriculum.

Interviewer: Do you have any recommendations to improve the curriculum? Do you have any recommendations that might improve things?

Karen: I guess maybe more communication between the two of us. Like a thing of what dates and then what lesson you’re doing or . . . , then I could ask more about it. Say, here’s your key question that you can ask when they come back to me. [I sent the teachers a lesson plan and explained what a lesson included] (see Appendix J).

Interviewer: I like that idea. Key question. I like that key question idea (Karen, Week 3 interview, May 14, 2015).

Mary also mentioned wanting to know more about the intervention in her three week interview; however, none of the teachers responded to the email detailing the intervention or a sample lesson.

Interviewer: Do you think your students have improved in their literacy skills?

But do you think they improved in reading and if so, do you really think it is attributable to this? Please be frank, guys.

Karen: I don't think there was enough time with you to even make that call.
Kimberly: Like maybe if it would have been October or November when we kind of got a handle on the first six, eight weeks of school, and then we were worried about . . .

Interviewer: And done it for how long?

Karen: Probably, I don't know, at least three months, easily.

Mary: Three months.

Kimberly: One grading period.

Interviewer: Okay, so starting in October and do it for a grading period (Week six group interview).

Interviewer: Please describe your students' response to the intervention.

Kimberly: Academically? Or . . .

Interviewer: In any way rate their performance.

Kimberly: They really enjoyed going nobody ever liked or baulked or any excuses so I think they enjoyed it. Academically just too short of a time to really notice much growth. They didn't really share a whole lot as to what was going on in your class. That might have been my mistake; I just didn't have enough time to ask enough questions. They would come in, and we would be in the middle of something, and then it was time for lunch, and then we just moved on. Well it would have been good to want to share with us what you've been doing, but we just didn't get to that.

Interviewer: I wanted to ask you, as you used one of the books. What was your class' response to that?

Kimberly: They loved it. There were some that really got into it. I think there was some repetition in there, and they caught it on to that. Then sort of joined in. That was a big hit. They have a listening center that they go to and follow along in a book, but I've never put a CD in,
held the book, and kind of turned the pages. Maybe it's something different for them. They enjoy that (Group, Week six interview, June 4, 2015).

Kimberly again noted a need for more time in the program.

Interviewer: Do you have any recommendations to improve the curriculum?

Kimberly: I honestly think no. Just give it a longer length of time that’s possible. Just a longer period of doing it (Kimberly, Week six interview, June 5, 2015).

Interviewer: Do you have any recommendations to improve the curriculum?

I know you all talked about it taking place earlier in the year, and lasting for a longer amount of time so we could really measure it better.

Karen: Definitely.

Interviewer: Those are excellent ideas. Anything else?

Karen: Just how many days a week you do?

Interviewer: Two.

Karen: I think two days a week isn't very much when you're talking about kids with these needs.

Interviewer: So you'd like to see it done every day for a semester and see what happens?

Karen: Sure (Karen, Week six interview, June 8, 2015).

The longest interchange with the teachers occurred in Mary’s week six personal interview. It revealed the interest the teachers had in improving their students’ abilities, their knowledge of what would help, and their willingness to participate in an activity designed to help all of their students.

Interviewer: Do you have any recommendations to improve the curriculum? Karen said, just an everyday thing instead of twice a week. Then ya'll wanted it for next a semester.
Mary: If I knew what you were doing, if I could observe a lesson, if you could video tape a lesson then I could maybe use those strategies maybe once or twice in my room.

Interviewer: Excellent.

Mary: Do you know what I mean?

Interviewer: Yeah.

Mary: Then there would be a whole group but then they would get carry over. I think if maybe we did that. Not a long time, but a five minute activity I could do.

Interviewer: Right.

Mary: With rhythm based. Do that at a free reading or something like that. That'd be fun. I think that would help. Both, for both them [General education students and students with disabilities].

Interviewer: Right. To reinforce it. Excellent, excellent.

Mary: You know, teachers don't mind doing anything if they know how to do it and if it's quick. You don't have to get out a bunch of stuff. I don't want to get out the balls, whatever you want. If there was a quick little poem with the rhythm we’d just do that real quick before we start reading to get them focused.

Interviewer: Right.

Mary: That would be perfect.

Interviewer: One of the rhythm claps at the very beginning of class, and then we just do it for five minutes. We turn on the metronome. (Clapping) To entrain the brain

Mary: There’s a lot of behavior things like that where before they start learning you give them all kinds of brain games.

Interviewer: Right, you do that.
Mary: I think that would be something that would be more beneficial to you and the kids and the teachers.

Interviewer: You could every week say, “We're going to do this little poem, this is how it goes.’

Mary: This is the poem for the week.

Interviewer: Everybody goes over it and it would help your other ones.

Mary: Yeah.

Interviewer: It's not like it's not gonna help. If they're already reading well, teaching them rhythm doesn’t tend to help.

Mary: It's fun. School has to be fun sometimes, too. If it only takes five minutes. It's a big deal.

Interviewer: That's really . . . extra special.

Mary: Even with good readers, there’s words they don't know. The rhythm, the brain working, I just think for that point . . .

Interviewer: Yeah.

Mary: A lot of my smart kids were hyper kids.

Interviewer: Give them focus. Excellent suggestions here. Favorite suggestion (Mary, Week six interview, June 5, 2015).

**Artwork from Students**

Children use art to express their feelings and as a form of story-telling (Harrison, 2015; Soundy & Lee, 2013). Drawings can be realistic but may contain patterns that reflect what the child remembers or feels (Harrison, 2015; Soundy & Lee, 2013). Moreover, students include ideas and features they personally consider important (Harrison, 2015; Wood & Hall, 2011). I gave special attention to the students’ explanation of their pictures with minimal interruption of their descriptions (Harrison, 2015). However, not all students find art a medium with which they
are comfortable (Harrison, 2015). Two students chose not to submit artwork to the program. I printed the students’ pictures as drawn with the exception of changing the labeled names to the pseudonyms of each student.

**Cody.** Cody is a student diagnosed with a Developmental Delay and Language Impairment. Formal testing revealed Cody performed in the average range in all areas of academics with the exception of decoding, which was just into the below average range compared to his same-aged peers. Cody’s end of year reading was 380/420 in SRI (see Appendix K). Cody’s favorite thing about the rhythmic intervention was being together as a group (Theme Three: Connection). He drew eight figures that included himself and me. Cody drew himself in the center of the picture. His setting was the stage.

*Figure 1. Cody's Drawing*
Interviewer: All right, let's talk about this picture you drew me because I love this picture. I have to ask you certain questions. All right, so be specific. What is it?

Cody: I was playing the drums.

Interviewer: You're playing the drums, okay. What's happening in the picture? I mean, I love the detail you have.

Cody: We are matching beats.

Interviewer: You're matching beats. Oh, okay. Oh, is this the metronome right here?

Cody: No, that's the soccer ball.

Interviewer: The soccer balls. Okay, okay, I'm glad you told me that. Do we have a metronome in here? Or is it just you all matching beats? You got the sticks in your hands. I love that.

Cody: I didn't do a metronome.

Interviewer: Oh, it's okay. It's okay. I love your picture. Is this the black curtain in the [Auditorium]?

Cody: Yes.

Interviewer: Yeah, it's so cool. You made these blue against the black curtain in the stage area. You put the soccer ball. What are the soccer balls on? What is that?

Cody: The buckets.

Interviewer: Buckets? There's some more buckets there. Oh, okay, great. Is this me? Which one's me? Okay, I just thought, because . . .

Cody: [Points on the picture.]

Interviewer: Okay, which one is you? I like that. You're right dead center, aren't you?

What are we saying right here?

Cody: Nothing.
Interviewer: Nothing? Just matching the time? Matching the time. Okay, really good. Awesome I love your picture a lot. Okay. That was really great. Okay Cody, thank you so much for helping me with my project (Cody, Week six interview, June 4, 2015).

**Jacob.** Jacob is a student diagnosed with Developmental Delay and Language Impairment. Jacob’s scores on the Wechsler Intelligence Scale for Children IV (WISC-IV) proposed overall measurability within the Low Average Range. Jacob has a behavioral plan, takes medication for ADHD, and regularly sees a mental health specialist. Jacob’s end of the year reading was F/M in RRR (see Appendix K).

Jacob’s favorite thing about the rhythmic intervention was the drums. In particular, he liked the echo of the drums which is demonstrated in the stage versus music room setting of his picture. Furthermore, Jacob liked to control the class with his ideas. He was the only student participant who would have preferred the intervention have been one-on-one. Likewise, Jacob is the single student who drew only himself and me in the picture. Jacob drew me in a thumbs-up position (Theme One: Attention).
Interviewer: Mr. Jacob, I want you, you're the only one that drew me an American flag. You're the only one that drew me a camera. So tell me what's going on here? Are we in the music room or we’re on stage?

Jacob: We're on stage. You see one, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve, thirteen lights.

Interviewer: That's some lights.

Jacob: And they're red.

Interviewer: Why did you make them red?

Jacob: Because basically red means good luck.

Interviewer: Oh. Okay. That's interesting you came up with that. Why did you put the American flag there because we're on the stage? Is there a flag in that room? I have missed the flag.

Jacob: Behind the flag things, the little blue things, the curtains.
Interviewer: Okay yeah. I know we have that black curtain. Cody drew for me the big black curtain, it was great. But you drew for me the camera. Tell me why you drew the camera?

Jacob: Because usually me and my cousin, after asking my uncle [starts to talk about making videos.]

Interviewer: Oh that's fun.

Jacob: Me and him, we would like to be YouTubers one day.

Interviewer: Okay.

Jacob: Yeah.

Interviewer: So you're interested in what you can use the camera for. I get it. So tell me what's going on with these two people here. What are we doing?

Jacob: That's me and I'm doing the drums.

Interviewer: Oh pink is my favorite color. Did you know that?

Jacob: No I did not know that.

Interviewer: Yeah pink is my favorite color.

Jacob: Actually blue, my cousin tried, my cousin, we make videos.

Interviewer: Very interesting. Just to review, this is me in pink and I'm given you a thumbs up. You're the one drumming. I can see your sticks drumming on the drum. I know you said you like to make the noises and you're the only one in this picture. Very good hon, I so appreciate your help on my project (Jacob, Week six interview, June 4, 2015).

Cameron. Cameron has struggled in school and receives Tier One and Tier Two RTI interventions in reading comprehension, decoding, and phonemic awareness/phonics.

Cameron’s end of the year reading was I/M in RRR (see Appendix K).
Cameron’s favorite thing about the rhythmic intervention was drumming (Theme Five: Curriculum). He drew himself with two classmates and myself (Theme Three: Connection). Additionally, he added details to the picture that included the lights on the stage, exit, and metronome. Cameron also took artistic license and colored the drum buckets the colors he wanted them to be.

Interviewer: All right. Your picture, which I love, you all already got these pictures drawn, I got to ask, what is this right here?

Cameron: Lights.

![Figure 3. Cameron's Drawing](image)

Interviewer: The lights, okay. That was my guess, but one of my girls was looking at it and it’s like I think those are music notes. I thought, ‘But you're not in the room we're in.’ I thought it was the lights. Now is this the music room or is this the stage?

Cameron: Stage.
Interviewer: Okay that was my guess too. So I got to ask, I've got a specific question I'm supposed to ask you. What is this? Can you explain it to me?

Cameron: This is where, this is the stage and these are the drums, that's the exit door there. This is Cody, Jacob, this is me, that’s you.

Interviewer: That's me. Okay, cool.

Cameron: And I think that's it.

Interviewer: What is this right here?

Cameron: The brown box.

Interviewer: Okay, see. I wondered if it was the metronome. You know that little tick, tick, tick, tick, because it kind of looks like that.

Cameron: Yeah it is.

Interviewer: But I wasn't sure if that's what you were trying to do.

So these, even though you made them different color, I almost thought these might be the soccer balls because they were different colors. So these are all the drums? And let's see, what's happening right here, what are we doing with the drums?

Cameron: The little sticks like [paused]

Interviewer: Oh I see the sticks, okay yeah. These little things right here are the sticks. Okay, got you. Are we playing? What are we doing with the sticks?

Cameron: Playing the drum.

Interviewer: Okay we have the drum. Is there any particular activity that we're doing with the drum?

Cameron: Yeah, the way we do that matching thing.
Interviewer: Oh the matching? The absolute matching. Okay good. Are we talking to each other at all? We're not, we're just listening and matching. Why did you make the drums different colors? It's not wrong, I don't disapprove, I'm just asking.

Cameron: Because I like different colors.

Interviewer: You like the different colors, okay. I'm one of those people, I never, unless it's an absolute have to, I don't tell you what color to make anything, I don't tell you to put it in the lines because I think you should express what you think. I wish I could have found different color buckets but the blue was all I could find (Cameron, Week six interview, June 4, 2015).

Isabella. Isabella attended pre-school and repeated kindergarten. She struggled in all areas of her schoolwork. Isabella’s end of the year reading was K/M in RRR (see Appendix K). Isabella’s favorite thing to do in the three week interview was using the balls to demonstrate rhythm. She particularly liked passing the balls because it reminded her of soccer which she played (Theme Five: Curriculum). In her six week interview, her favorite thing was the word rhymes (Theme Three: Connection; Theme Five: Curriculum). Isabella was the only student to
draw two scenes in her picture. These illustrated her two favorite parts of the rhythmic intervention.

Figure 4. Isabella's Drawing

Interviewer: Let’s talk about your picture right here. I’ve got a couple of questions to ask you about that. Uhm, okay so first off I want you to tell me what it is and describe to me what is going on.

Isabella: [Points out four children] and that’s you.

Interviewer: (Laugh) I see have a music stand right there.

Isabella: [Talks about drawing the metronome “the thing that goes back and forth” and then drawing the music on the board for other students to play.]

Interviewer: Is it a quarter note or eighth note?
Isabella: I don’t know.

Interviewer: [We talk about the “butterfly”, “caterpillar”, “woodpecker”, “Brown bear” for the various notes. Students used modified rhythm rather than full note.]

These are the seats we were sitting in and what are these pieces of paper?

Isabella: Yes, they are the papers with the Double Double This

Interviewer: Oh that’s right we did. [The words for hand rhymes were on paper.] Oh this is you and Mia.

Isabella: We are saying the Double Double

Interviewer: What happened? [Points to board in drawing.]

Isabella: Drawing music for other students to do. Double, Double, This, That, and passing the balls in rhythm. [Points in succession to items in the picture.]

Interviewer: [We talk about the colors of the ball. I noticed it looked purple, but Isabella told me she tried to use pink but it turned out purple.] Yeah, I tried to find purple. My youngest daughter’s favorite color is purple, and I figured a purple one would be a popular one. What was said?

Isabella: The kids weren’t really saying anything. They were doing the ball moving thing.

Interviewer: Did you like that activity? I think that was the hardest thing we did to pass the ball and keep it in rhythm. To the pass–pass-pass. Ok that is it, thank you so much (Isabella, Week six interview, August 7, 2015).

Ethan. Ethan was a child diagnosed with a speech disorder. He received speech therapy through the school. While he struggled in school, each of his teachers had noted his distractibility and lack of personal effort. Ethan’s end of the year reading was K/M in RRR and 203/420 in SRI (see Appendix K).
Ethan’s favorite part of the rhythmic intervention was drumming whether that was the buckets or the soccer balls (Theme Five: Curriculum). He drew both main settings for the intervention and drew six participants including myself (Theme Three: Connection).

Figure 5. Ethan's Drawing

Interviewer: What's, we are all saying something? Oh Ethan you put your glasses on that's so cute! I love that! That's my favorite part of the picture, you put your glasses on!

Interviewer: You seem like a pretty happy kid there. All right, Mr. Ethan this is your picture. And you have labeled: you have Jacob and Gabriel and [paused] Mia and Ethan.

Ethan: [something about spelling the names right]

Interviewer: I used to misspell my name when I was your age just to mess with the teacher. Shh don't tell anybody! Is this me?

Ethan: Uh huh.

Interviewer: What are we talking about here?

Ethan: [talks about us all getting inside the drum and beating on it]
Interviewer: Were you here the day we put the buckets over our head and beat on them?

Ethan: No.

Interviewer: That was fun. We put the buckets literally on our heads and matched the rhythm by beating the sides. It was an interesting thing to do. Ok, so you gave me yellow at the top, then red here, green here, and green at the sides. Why?

Ethan: Because, of the soccer balls.

Interviewer: Oh that's right, you do love the soccer balls don't you. All right, uh, what is this right here?

Ethan: [talks about the floor]

Interviewer: So this is the stage or music room?

Ethan: Both

Interviewer: Oh, I see. You drew both! We have blue carpet; I do see that. I get it now. Oh Ethan, this is so sweet; I love this. Oh what are these right here?

Ethan: Drum sticks.

Interviewer: Oh drum sticks, I see. Ok, I'm glad I asked you that one! Ok, this is Jada, and this one is Gabriel, and this one is you. Perfect! This is exactly what I want to see (Ethan, Week six interview, June 4, 2015).

**Jada.** Jada was a child diagnosed with a specific learning disability. Her Woodcock Johnson Tests of Achievement Third Edition Normative Update (WJ III NU) showed lower Reading and Written Language skills. Jada received special education services for literacy daily. Jada’s end of the year reading was K/M in RRR and 273/420 in SRI (see Appendix K).

Jada’s favorite part of the rhythmic intervention was sounding out the syllables of participants names whether on the drum or the soccer balls. She drew nine figures including
myself (Theme Three: Connection). Each was holding a bucket drum to beat out names (Theme Five: Curriculum).

![Figure 6. Jada's Drawing](image)

Interviewer: All right, now, I love your picture. Each one of you've been so very different. That's what's been fun about it. What I want you to tell me is, what's going on right here? Do we have everybody? One, two, three, four, five, six, seven, eight . . . Got all of you. Tell me about the picture.

Jada: We are playing drums.

Interviewer: You're playing drums. Oh, okay, that's what the blues are, blue is drums, and what? I'm looking for the sticks. Is the hands this part of the sticks?

Jada: Yeah.

Interviewer: Or are we not using sticks?
Jada: We're not using [paused]

Interviewer: We're not using sticks. You could have drawn this several different ways.

Jada: I forget to color . . .

Interviewer: It's okay, Hon it looks great. We're all playing the drums, that's what's happening and we’re playing without sticks. This is me?

Jada: Yep.

Interviewer: This one's you?

Jada: Yep.

Interviewer: This is Michael?

Jada: Yep . No, it's Cameron.

Interviewer: Oh, that's Cameron. Here we have [pause] Gabriel and Ethan, Mia, and Isabella.

Okay, very cool, very cool. What I want to know is you've got cloud and sunrise. What's going on right here? I love your hearts. You did the purple and the green hearts, I guess, because you love class. We're drumming the drums. Are we saying anything?

Jada: Yeah.

Interviewer: What are we saying?

Jada: Sounding out people's names, Ja-da.

Interviewer: I love that you did the pink and the purple, pink and the purple, and colored in.

That was really nice (Jada, Week six interview, June 4, 2015).

Gabriel. Gabriel struggled with comprehension and fluency. His RTI in Tier 2 and Tier 3 interventions were targeted to these areas. His teacher believed he had processing difficulties rather than attention problems. Gabriel’s end of the year reading was I/M in RRR and 247/420 in SRI (see Appendix K).
Gabriel’s favorite part of the rhythmic intervention was the drums because he wanted to play in a drum line when he was older (Theme Five: Curriculum). His was the most detailed drawing of participants. Gabriel drew four figures including myself (Theme Three: Connection).

Figure 7. Gabriel's Drawing

Interviewer: Okay. I have been so excited to talk to you about this picture. This is really intricate. You put people on chairs, I’ve got a sunshine in my classroom, I’ve got drums here, everybody's got sticks, and this is you. I love this one. So this is just your class. This is, seriously, this is awesome. We got some extra drums over here. What's this?

Gabriel: [Talks about drawing the rhythm on the board]

Interviewer: So when we draw the rhythm, we match the rhythm, is what this is? You're the only one that did this one too. It's awesome. Okay, so we're playing drums. What are we playing on the drums?
Gabriel: We’re doing the same, but like different. . .

Interviewer: Doing the same in different beats. Okay. I do like doing that one. That one's fun. You made everything blue. I love how you colored in you and Jada's faces. That’s awesome. I'm pink. Oh God, that's hilarious! My face does turn red, doesn't it? Yeah. It's something called rosacea, but my face does turn pink. That's so cool. You got Ethan. Seriously, so intricate, honey. I'm so proud of you. So we're just doing same in different sounds. Are we saying anything else?

Gabriel: Doing the same and different.

Interviewer: Awesome. I love it. So this is where we draw the notes on. We're in the music classroom here. I like drawing, you're also good at drawing those notes and matching what somebody else said. Okay, sweetheart. Thank you so much for your time and helping me with this (Gabriel, Week six interview, June 4, 2015).

**Research Question One**

The question, “How do second-grade students describe their learning experience with a rhythmic intervention over a bounded time period?” was designed to elicit the feelings the children had about the rhythmic intervention and their reading skills. The students uniformly enjoyed the intervention. They were excited to see me and participate in the various activities. Most of the students tried some of the activities outside the intervention. Moreover, they enjoyed the special attention of the intervention and personal interaction with me. While I had anticipated the students would gain confidence in their reading skills, which most did, I had not anticipated the enjoyment the students took in being together as a group. With one exception, the feeling of connectedness was a major theme.

**Research Question Two**
I directed the question, “What are the perceptions of general education teachers about a rhythmic intervention and their students’ response to the intervention?” at the teacher participants. I had anticipated the teacher participants to notice growth in the students’ literacy and less stress or behavioral problems. However, the teachers, while noting the improvement in their students’ reading skills, did not feel it was because of the rhythmic intervention. They cited other interventions in which the children took part. Furthermore, I noted little improvement in behavior or stress levels.

Nevertheless, the teachers did believe the program was a success because it gave their at-risk students more personal attention. As a group, they strongly stated that any intervention was helpful because the children were at the core very needy students. The personal attention paved the way for a more successful learning environment. Additionally, all the teachers commented about the students’ attachment to me as a teacher. They noted the students’ eagerness to participate in the program even when another fun activity was happening in the classroom, or the student did not generally like to leave the room. Furthermore, the group recommended expanding the program in length and scope. They were interested in incorporating some of the ideas with their general education classrooms.

**Research Question Three**

The question I sought to answer was, “What do descriptions and pictures drawn by second-grade students reveal about their personal feelings about a rhythmic intervention and their literacy instruction?” The student drawn art produced the richest data on the students’ feelings about the rhythmic intervention. Although the artwork simply confirmed the recognized five themes, the children’s perception of the curriculum and their interaction with each other and me was established more clearly. The themes of attention, connection, interventionist, and
curriculum were noticeable in each of the drawings. The children included me in every picture. This was not true of any other person. Even the student not interested in connection with the other children, drew me with my thumbs up for affirmation of his drumming. In addition, each of the students’ favorite activities were in the picture even if that meant drawing two scenes.

I had not anticipated the importance of the setting in the students’ minds. Six of the seven pictures had a particular setting and one of these contained both of the main settings. The children drew details including a black curtain, exit sign, blue carpet, music stands, metronome, American flag, chairs, and a white board. However, they did feel at liberty to add details that they desired like the preferred color of the balls or hearts to describe their feelings.

Lastly, the students took real pride in their artwork. They wanted to discuss the details and explain what each thing represented and the people illustrated. I believe it served as an added confidence enhancement in the intervention echoing Theme Two.

**Summary**

The data on the student participants came from two main sources: Reading Running Records (RRR) and Scholastic Reading Inventory (SRI). Students in the school district are tested four times each year with both assessments (see Appendix K). Standard expected improvement in students who are below grade level is 100 points in a year (Scholastic Reading Counts, n.d.). Furthermore, Fountas and Pinnell (RRR) list an anticipated increase of level K to level M in second grade for the general education student (Fountas & Pinnell, 2014). The student participants were all at least a year behind their expected reading levels. All of the children showed progress over the bounded time period of the rhythmic intervention.

Not all of the children had both types of scores available. The school supplied the data that they had for each students. The student participants improved over the bounded time by the
following level and/or points. Cody improved 274 points on SRI. Cameron moved up two levels from level G to level I in RRR. Ethan improved 145 points on SRI and moved up one level from level J to K in RRR. Jacob moved up two levels from level D to level F in RRR. Gabriel improved 108 points on SRI and remained on the same level (I) in RRR. Jada improved 103 points on SRI and moved up from level J to level K in RRR. Mia moved up one level from level K to level L in RRR. Isabella moved up two levels from level I to level K. Finally, Michael moved up two levels from level D to level F in RRR. While the data on the students showed improvement in all of the students, the research questions were answered by the perceptions of the participants and the students’ artwork.

The student-participants in the study enjoyed the program and felt it was worthwhile. I noted themes of attention, connection, confidence, interventionist, and curriculum through pattern coding. The students generally believed their reading had improved through the program. Moreover, their enjoyment of the interventions and particular activities were shown in their interviews and artwork. Although the students all improved in their reading assessments, the teacher-participants did not believe the program helped their students’ reading abilities. They did believe the program of worth because of the extra attention the children received and suggested the program be expanded in time and scope.
CHAPTER FIVE: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Overview

The importance of reading to access knowledge and the ability to learn is widely acknowledged. However, many students still struggle to learn to read. Music has been used successfully as a tool to add in literacy acquisition including students with disabilities (Bolduc, 2009; Huss et al., 2011; Moreno et al., 2011). Furthermore, a student’s aptitude in rhythm can reflect their ability in phonological awareness and basic word identification (Moritz et al., 2013). The purpose of this intrinsic, holistic case study is to describe and analyze the impact of a rhythmic intervention designed to support literacy skills in second-grade students at-risk of failure of state mandated reading assessment. The findings of this case study may contribute to a better understanding of how the brain acquires literacy through the use of rhythm. Five to six interview questions have been asked through individual interviews with the student and teacher participants, a teacher group interview, and through students’ drawings about the rhythmic intervention.

This chapter encompasses a summary of the findings and themes that are developed through analysis of the research data with their implications. The conclusions of the case study are compared with the literature review in Chapter Two including theoretical framework, literacy instruction, and classroom culture. Also, limitations for the research are noted. Finally, recommendations for further research are discussed.

Summary of Findings

Through observation of the 12 interventions and interviews with the student and teacher participants, five themes emerged from this study including: attention, confidence, connection,
interventionist, and curriculum. The themes developed through observation of the interventions and interviews with the participants and answered the research questions framing the study.

**Research Question One**

How do second grade students describe their learning experience with a rhythmic intervention over a bounded time period? All of the students were favorable to the program and stated their enjoyment of the class. The students favored the “drums” (large plastic buckets) and soccer balls. One student preferred being inside the bucket as a type of helmet and feeling the vibrations. The soccer balls were used to pass in time or used as an alternative drum. The latter was the favorite style. Furthermore, the girls in the class stated a preference for the hand-clapping routines. One student replied his favorite part was being together with the other students at both his third and sixth week interviews.

The students were reluctant to say anything too negative about the program, four interviews yielded nothing as a least favorite, two students wanted more than two days a week, and another listed leaving as her least favorite part. The second largest general negative category involved the use of the soccer balls. Several students did not like passing the balls versus hitting the balls while another student preferred passing over hitting the ball. Another student wanted individual soccer balls versus sharing with another student. Two students noted how loud the bucket drums were in the classroom/stage. One student did not care for the hand-clapping, and another thought reading a book at the end of the intervention was boring.

When asked if they had improved in music, there were 17 total replies during the third and six week interviews. Five students felt they had improved rhythmically, and four were neutral on the question. Students cited matching of rhythm with the metronome, naming same
and different, matching rhythm, and hand-clapping. Neutral students did not give a reason for the neutral answer. There were no negative answers.

Students were asked if they had improved in their reading skills. Of the 18 responses, eight of the students felt they had improved their reading skills at the three and six week interviews. One student was neutral on his progress. Students predominantly stated moving up levels in reading as their proof of reading improvement (see Appendix K). However, some noted reading chapter books, improvement in word flashcards, progress in spelling hard words, and reading to other people.

Students were asked how they felt after the intervention. Of the 18 responses, half the students stated they felt well after the intervention, but they did not feel differently the other days of the week. Two students stated they felt less “stressed-out” or “balanced.” Several noted that they were either sad to leave the class; were sad not to see the interventionist; were sad there was not a class that day; or found the other days boring.

**Research Question Two**

What are the perceptions of general education teachers about a rhythmic intervention and their students’ response to the intervention? The teachers universally felt the students enjoyed the intervention. They noted the children were excited to go and never balked about going even if something special was going on in the classroom. They also stated the children looked forward to seeing the interventionist. Academically, they all felt the time length of the intervention was too short to give it a positive rating; however, they felt the students benefited from the extra attention.

The teachers were asked if their students had improved rhythmically in each interview. The reviewers debated this question before placement in the study; however, because the musical
ability or use in the classroom was an unknown variable, the question remained in the study. All the teachers did not feel they could respond either positively or negatively. One of the teachers used music in her classroom for transitions and background. Nevertheless, she did not see herself as good with music, nor did she use music as an assessment or specific learning tool.

While all the teachers felt their students had improved in their literacy skills, they did not believe it was attributable to the rhythmic intervention. Several of the students started the year as non-readers but were in the 200s by the end of the year. However, 420 is the expected Lexile level for end of second grade. Moreover, M is the anticipated Fountas-Pinnell level at the end of second grade. The highest score for the students was an L. The scores ranged from F to L at the end of the year. The teachers noted these children also received pull-out help in reading. It was clear the teachers were well aware of their students’ strengths and weaknesses and knowledgeable in strategies to help them.

While the teachers all felt the program did not help their students’ literacy skills, they were universal in stating they believed it helped the students. The teachers believed any individual time and extra programs gave their students exposure to different ideas and was helpful in the learning process. They also felt the program should be longer so they could give a more complete answer to the question.

In general, the teachers stated the children’s behavior was the same. One teacher noted a student who was less active on days of the intervention. They also stated the children were excited to attend the class and were happy when they returned. One class had specials directly after the intervention and then lunch. That teacher did not see a difference.

The teachers were generous in their ideas to improve the program. The number one recommendation was a longer time length for the program itself. They wanted some
professional development to garner knowledge about the program and specific items to implement with the entire class to supplement what the rhythmic intervention was giving the students at-risk. Moreover, they were interested in seeing a video of the intervention and asked for a sample lesson plan. The teachers stated a willingness to implement the program if proper helps were in place. Finally, they requested a question to ask the students after each intervention to better interact with the students and the program.

**Research Question Three**

What do descriptions and pictures drawn by second-grade students reveal about their personal feelings about a rhythmic intervention and their literacy instruction? The pictures drawn by the students gave detail into the thought process of the second-grade students. Every picture portrayed a positive response to the intervention. Moreover, all but one students drew multiple members of the intervention. Connection between the students was a strong theme. Furthermore, students drew what they stated as their favorite part of the intervention. Finally, the students were most excited and talkative when describing their pictures. The richest part of the interviews was given in relation to their artwork.

**Discussion**

Findings in the data indicate the enjoyment the students had in the rhythmic intervention. Furthermore, the data stated the teachers did not feel the intervention improved their students’ reading abilities. However, they considered it a success because of the extra attention their students received and the benefits inherent with the attention. The study’s interpretive stance reflects the multiple realities each person builds in their minds. These individual experiences in the larger whole are noted in the foundation of Disability Theory and Critical Realism upon which the study is based.
The combination of factors that was important or effective with an individual was different for each participant. For example, one student’s need for sole attention led him to draw himself as the only participant in the intervention with the interventionist as an encourager. Conversely, another student that valued the connection with his fellow students drew all the student participants in the intervention with an actively involved interventionist.

Critical Realism states individuals have different combinations of challenges and needs. Their situations, consequently, need personalized examination and treatment. The same is true of each of the participants. The teachers approached the study as a tool to help their students, but it was only one tool in a large collection. They looked at the needs of their students and employed over-arching, multi-dimensional interventions.

Critical Realism posits events are not isolated or compartmentalized. There are many contributing factors in a complex environment. The students recorded favorite activities were ones in which they personally felt success. The girls liked the hand-clapping, particularly if it was a group rhyme. The boys typically enjoyed the drums or the soccer balls used as drums. The transitive and intransitive dimensions of reality were evident in this social construct of the intervention. Students simply preferred the activities in which they had success and in which their disability did not exist. For example, the student with a speech deficit did not prefer the hand-clapping rhymes but the soccer balls.

The combination of body, cultural aspects, and environment are important elements of disability theory (Bhaskar & Danermark, 2006). The study noted the combination of factors unique to the individuals in this setting. The teachers all felt pressure for their students to read at a certain level. They were conscious of where their students began and what the goal was for each child. All of the participating teachers had at least 20 years of teaching experience and
were confident of their personal abilities; nevertheless, each felt the burden of testing on their students and themselves. High-stakes testing was a factor in not only determining the success of the study in their minds but also in the advice they gave for improving the curriculum. However, the teachers were also concerned with their students’ background on a personal level. The teachers demonstrated this in their detailed knowledge of their experiences both academically and personally. It was the interweaving of academic and personal needs, as stated in critical realism, which motivated the teachers.

The emotional support offered by music instruction has been documented in a large number of studies (Chong & Kim, 2010; Foran, 2009; Hudziak et al., 2014; Locke & Clark, 2009; Rickson & McFerran, 2007; Ritblatt et al., 2013; Sacks, 2007). Music facilitated better retention of the subject but also supported emotional health, cooperation, and interpersonal skills. Moreover, these students were more engaged in the learning process throughout the day.

The themes of the rhythmic intervention were not related to music or the positive data for all of the students. The five themes reflected classroom culture. Both teachers and students felt the intervention was successful because of the positive feelings developed through the intervention.

**Theme One: Attention**

The student participants repeatedly noted their personal enjoyment of the rhythmic intervention in their personal interviews. I also cited the pleasure of the students during the intervention in my reflections. Various studies corroborate the importance of a students’ enjoyment of their class as a motivating factor in their improvement in academics and in classroom behavior (Degener & Berne, 2014; Marchard-Martello et al., 2015; Noltemeyer et al.,
2013; Weiss, 2013). Students are more motivated to learn a subject if they enjoy it and that enjoyment can carry over to other tasks.

The extra attention received by the students through the intervention was the most mentioned benefit of the study by the teachers. However, the teachers did not believe the program enhanced the literacy skills of the children involved. Small group activities have been shown to increase students learning over one-to-one teacher student ratio (Hunzer, 2012; Serravallo, 2010; Wasik, 2008). The teachers repeatedly stated the more attention the children could receive the better they did in class. Multiple studies state that positive teacher attention strengthens transfer of knowledge and its retention (Pai et al., 2015; Wasik, 2008). The desire for more attention was also an element in the teachers’ request for a longer more involved program. This was not only for the students in the study, but for the students in their general education classrooms.

**Theme Two: Confidence**

An individual needs to believe they can succeed to see the greatest growth in learning. Confidence is an essential element in the classroom for student growth (Demirdag, 2015; Favazzo et al., 2014; Matthias & Hessling, 2009). Mok (2013) noted the tie between teacher assignment of grades and the personal self-confidence of the students. If the students were confident in their abilities and performance, teachers tended to give higher grades.

Likewise, research notes the connection between student success and confidence mirrored by their teachers (Atta et al, 2011; Shaunessy & Mchatton, 2009; Siegle et al., 2014). Also, positive teacher views produced greater academic success, greater student self-esteem, and a greater sense of belonging to the school (Farrelly, 2013; Lee & Bierman, 2015; Pasto, 2014).
In addition, self-esteem played a key factor in the success of students with disabilities. Remedial intervention does not have the same effect as a child’s personal self-confidence in his abilities (Cheng, 2015). Students with disabilities are particularly affected by self-efficacy. Self-efficacy is how a student feels about their academic skills (Bergen, 2013; Ju et al., 2012; We & Marder, 2012). The effect of self-efficacy can be noted in elementary school and has a direct corollary effect on future academic accomplishments (Ju et al., 2012).

I noted the desire to succeed in the class in the reflections of the interventions. Students did not ask to do elements of the program they struggled in doing. Moreover, the students had to be encouraged to try each new activity if they did not have immediate success. An example of this was the hand-clapping pieces. The students took several interventions to get one learned well. When this occurred, they were very proud of their accomplishment and wanted to repeat the experience. Confidence builds resiliency in students causing great gains in academic knowledge and personal relationships (DiTullio, 2014). This was true to the extent the girls would practice the hand-clapping out of class and were teaching to individuals both in and out of school.

Lastly, students with disabilities are more likely to believe they can do an activity when it is taught by another student or peer than from the teacher (Bergen, 2013). While peer tutoring is a research-proven teaching technique, it is most effect in students with disabilities (Bowman-Perrott et al., 2013; Topping et al., 2016). The effect of peer tutoring was shown in the hand-clapping, writing and performing rhythm, and in the movement to music element of the intervention. Fellow students would give suggestions and students would imitate their classmates.
Theme Three: Connection

Hallam’s (2010) literature review of the power of music in 146 studies over a 43 year period showed positive results in a number of areas including social and personal development, self-esteem, confidence, better social adjustment, and emotional sensitivity. Peer relationships are an important part of a student’s self-esteem enabling them to do better in school and in society (Cheng, 2015; Park & Park, 2015). As well, students with learning disabilities friendships are not as plentiful or healthy (Wong & Butler, 2012). Educators can make a difference in building and strengthening connection bonds through classroom culture (DiTullio, 2014).

Correspondingly, the connection between the children and their enjoyment in being together was evident from the first intervention. Small group instruction strengthens both academic transfer and social structure in the classroom (Bowman-Perrott et al., 2013; Topping et al., 2016). The strength of the connection was noted by the student and teacher participants and in my reflections. Furthermore, the value placed on connection also was evident in all the pictures drawn with the exception of one. The pictures showed at least three other students with which the artist was particularly close. Some participants drew all the students and it was mentioned specifically in the interviews concerning why they drew their peers. Artwork has been shown to more clearly demonstrate a child’s understanding and perception of an event than verbal interviews (Barlow et al., 2011).

Theme Four: Interventionist

The fourth theme was the likeability of the interventionist. All the students and teacher participants mentioned how much the students look forward to not only participating in the intervention but in seeing the interventionist. Students with disabilities are particularly sensitive
to teacher support and this positive support has a neutralizing effect on risk factors (Bernstein-Yamashiro & Noam, 2013; Cambria & Guthrie, 2010; Spilt et al., 2012). Teachers who believed their students could succeed and believed they were trying in their school work had greater success in their students and particularly in children with disabilities (Wong & Butler, 2012). In like manner, African-American males were most affected by a positive student-teacher relationship (Spilt et al., 2012). Higher achievement in the classroom was linked to positive teacher feedback (Wong & Butler, 2012). Similarly, the likeability of the teacher was cited as one of four main areas to improve student performance in the classroom (Alderman & Green, 2011).

**Theme Five: Curriculum**

Students must find a curriculum engaging to learn to their full potential (Christenson et al., 2012; Schlechty, 2011). I based the curriculum for the rhythmic intervention on principles established in Dalcroze, Kodály, Orff, Tataku, and research-based reading instruction (Findlay, 1971; Frazee, 1987; Houlahan & Tacka, 2008; Kalani, 2005, 2008; Kelly, 2012; Matney, 2008; Mead, 1994; Montgomery, 2012). Materials included appropriate literature, buckets for drums, balls, same or different signs, metronome, and use of audio visual materials.

The students all stated their enjoyment of the curriculum. The students demonstrated this in the pictures they drew. All showed one of more activities used in the intervention. While the boys varied between the balls or beating the buckets as preferences, the girls principally favored the hand-clapping rhymes. The artwork drawn by the children showed hand-clapping, playing the drums (buckets), students passing soccer balls, drawing rhythm, and matching beats using the metronome.
Student choice within the intervention was also an important element of the curriculum theme. Choice in curriculum heightened enjoyment as was demonstrated in prior research (Beaton, 2010; El-Sherif, 2014; Romano, 2014). Although there was a detailed lesson plan for each intervention, I gave the students choices in activities and styles of producing the given activity. They were creative in how rhythmic activities were done and showed real enjoyment of an idea being repeated. For example, the soccer balls were part of the program as rolling and passing. The students made them into an alternative drum. Conjunctly, this was popular with the student sensitive to sound.

The teacher participants expressed interest in what was in the curriculum itself and how it could be applied to all the students in their classrooms. They requested a lesson plan which I gave to them. Their suggestions on how to make the program better noted a longer length of time, but also, additions to the curriculum itself. They wanted training and access to the materials the students were using so that they could reinforce concepts and include other general education students to better activate their brains for learning.

**Artwork from Students**

Art has been used as a medium to help children express their feelings and as a form of story-telling (Harrison, 2015; Soundy & Lee, 2013). While drawings can be realistic, they may contain designs that reflect what the child recalls or feels (Harrison, 2015; Soundy & Lee, 2013). Additionally, student choices include ideas and features they personally consider significant (Harrison, 2015; Wood & Hall, 2011). Minimal interruption occurred while the students explained their picture. This was a definite source of positive self-esteem. They were proud of their work and wanted to explain and talk about the different elements in the drawing.
The pictures were a definite reiteration of the themes of the study. They showed clearly the importance the students attached to attention, confidence, connection, the interventionist, and curriculum. Unfortunately, not all students were comfortable with art as a medium (Harrison, 2015). Two students chose not to submit artwork about the intervention.

**Implications**

The purpose of this intrinsic, holistic case study is to describe and analyze the experience of second-grade students at-risk of literacy failure of state mandated reading tests utilizing a rhythmic intervention. Additionally, the desire was to better understand how the brain acquires literacy through the use of rhythm. All of the students improved in their reading scores; however, the teachers were reluctant to attribute this gain to the program. The students were receiving other reading interventions through the school. Therefore, it would be inconclusive to state there was a causal relationship between the reading scores and the rhythmic intervention. While the teachers did not attribute their students’ improved reading scores to the study, there was an improvement in all the students’ scores. Consequently, the results cannot be completely discounted.

The findings of the study implied that a rhythmic intervention could be a successful intervention for children who struggle with reading. The scores for all of the children did improve over the bounded time, six weeks, of the study. Standard expectation of improvement for students in below grade level ranges is 100 points per year in second grade (Scholastic Reading Counts, n. d.). General education students would be expected to improve their STI scores by 200 points per year in second grade. The four students in the study with STI scores improved 103, 108, 146, and 274 respectively during the rhythmic intervention of six weeks. Reading Running Records (RRR) are expected to increase two levels in second grade (K-M).
Eight students had recorded RRR levels at the beginning and ending of the six week rhythmic intervention. Each moved up one or two levels with one exception, that student stayed level in RRR but increased his STI by 108 points. These substantial increases in reading level should be confirmed with further research utilizing rhythm as a tool.

The findings imply that children enjoy musical interventions and musical interventions improve reading scores (Atterbury, 1983; Bolduc, 2008; Bond, 2012; Corrigall & Trainor, 2011; Foster & Miller, 20017; Lucas & Gromko, 2007; Morrow & Dougherty, 2011; Standley, 2008). Clearly, the students enjoyed the program in curriculum content, with the interventionist, and with each other. Administrators, teachers, and parents should explore utilization of music as a foundation to establish a positive mindset toward learning. Engaging students even in a small music activity could open the mind to further learning and retention.

This study adds to the data indicating music as an engaging tool to teach literacy. Likewise, the earlier the musical study took place the greater the success of the program. While this study utilized second-graders, the curriculum base is applicable to younger students. A number of programs, including Dalcroze, Kodály, Orff, Kindermusik, and Kindergarten, utilize movement, rhythm, and pitch to engage babies as young as six weeks in music programs designed to increase enjoyment of music and success in academic subjects. The data implies engaging children in musical programs would benefit them in learning literacy skills.

The dominant success of the program from the perspective of the teachers was the attention the students received outside their purview. The teachers’ belief in small group instruction has been well-documented in research (Burns, Riley-Tillman, Van DerHeyden, 2012; Ledford, Lane, Elam, & Wolery, 2012; Serravallo, 2010). Small group instruction permits personal interaction with the instructor, but also allows the students to learn from their peers.
This combination is especially successful with children with disabilities (Bowman-Perrott et al., 2013; Topping et al., 2016). The data imply that the rhythmic intervention had a positive effect on the scores in reading and in the enjoyment the students took in school. The student and teacher participants all noted the anticipation with which the children looked forward to the rhythmic intervention.

The findings of this study imply that small groups support positive learning experience especially with students at-risk. The varied demands of teaching a large group can make finding individual positive moments more difficult. The intervention showed the importance of this to the students. Several of the students stated they enjoyed coming because they were told they were doing a good job. Even for students from a stable home, positive reflections were important (DiTullio, 2014). The majority of the children in the district did not come from traditional families. Poverty was a key issue with the children. While each parent or guardian was desirous to help their child, they were each struggling with the demands of basic survival. A positive connection with the teacher can have the effect of one-two years of intervention (Split et al., 2012). This positive connection could be a part of the increase in reading scores with all the students. Administrators and teachers should make opportunities for small group instruction more available. Additionally, the education community should look for ways to give genuine, authentic praise to students.

Many children at-risk in the classroom can have challenges with peer relationships. Connection was very important to the children in the study with one notable exception. This student was already receiving counseling and would have preferred the intervention to have been one-on-one or solely directed by him. Conversely, the other students valued the time together as a group and were anxious to learn the activities that were based on group interaction (Cheng,
The data implies interventions that encourage the building of personal relationships are more likely to give positive results for the participants. Teacher should look for opportunities to build peers supports through friendships to increase student learning and personal satisfaction.

The findings of this research imply student-led activities are a successful method of teaching as long as the goal of the activity was clearly established. I believe a substantial portion of the happiness with the curriculum in the students was the fact they had a say in what happened in the intervention (Lee et al., 2015). They appreciated that their ideas were considered valuable, and, in turn, the students were very engaged in the program. The data implies student choice is a strong element in a successful reading or academic program. Curriculum designers and teachers should actively seek ways to provide controlled choice in lesson plans.

Lastly, the attitudes of the teacher participants were unexpected. When I first began the project, they agreed to participate, but it seemed forced. However, early on that began to change. One teacher in particular went out of her way to make sure there were enough participants in the study. The teachers never refused to let the students out of their room, but if they were doing high-stakes testing, I did not ask. They gave time for the interviews when it was clear they had many other things to do. The pressure the teachers felt for their students to meet the state standards was evident, not only for their careers but for their students’ academic success. The combined interview was very helpful in determining what were the successes and failures in the study and yielded many thoughtful ideas to improve and expand the curriculum.

The teachers wanted their students to succeed, and they were willing to give their time in that endeavor. Nevertheless, the teachers wanted a program that they understood not only program wise but in theory/research. Moreover, they were looking for ways to connect with
children that left their classroom and ways to tie that instruction into their regular curriculum. Additionally, they wanted to share, at least part, of that other instruction with the classroom to further emphasize the knowledge in the students at-risk and allow a shared experience with their classmates.

Intervention programs should include professional development for classroom teachers with materials to reinforce the learning outside the classroom. Additionally, there should be materials designed to include the general education classroom, even if it is small. This shared experience makes for a richer learning environment for all the students.

**Limitations**

This case study was performed in one school with nine children at-risk for failure of the state mandated reading test. The students were from three classrooms in a Midwestern urban school with challenges in poverty and other social-economic problems. The findings might not be reflective of schools in other settings.

Because the study student participants were only nine in number, a greater number of students might have provided different results. Furthermore, while each child had been identified as at-risk of failure, not all students were in the special education program. They were all receiving help of some form including RTI second or third level.

From the first intervention, the connection between the students and me was positive. That relationship grew over the seven weeks of the program and contributed to the success perceived by the student and teacher participants. My affection toward the students could also be stated as a bias and could have impacted my personal perception of the success of the program.
The teachers in the study were knowledgeable in their field and had all taught for 20 or more years. They were familiar with how children learn and cognize of their students’ challenges. This was demonstrated in the insightful comments made by the teachers. Another school might not have teachers with this much experience teaching in the general education classroom.

The curriculum was designed to blend the interventionist perceived best elements of Dalcroze, Kodály, Orff, and Tataku. There was not a commercially available product of this description, and one was constructed. These may have not been the best combination of resources and another combination might be more successful.

The length of the intervention was 12 session interventions over a six week period. The time period was short and this may have affected the results. A longer time period may have produced a different result.

**Recommendations for Future Research**

A number of studies have been conducted on the effectiveness of music as a tool to teach literacy (Bolduc, 2009; Corrigall & Trainor, 2011; Lucas & Gromko, 2007; Moreno et al., 2011; Piro & Ortiz, 2009; Strait et al., 2011). Many have shown promise in helping general education students and students with disabilities (Benson, 2000; Forgeard et al., 2008; Huss et al., 2011: Overy et al., 2003). Rhythm in particular has shown positive benefits for literacy acquisition (Fujioka, Ross, Kakigi, Pantev, & Trainor, 2006; Habib & Besson, 2009; Kujala et al., 2001; Moreno et al., 2009; Skoe & Kraus, 2012; Tierney & Kraus, 2013; Watanabe, Savion-Lemieux, & Peahume, 2007).
Music has recently become a core subject in the classroom. The desire of this study is to see music applied in more than the standard music classroom. The benefits of music as a tool to teach reading and mathematics have been previously established in research.

Future research projects could design studies around the following:

- The case study was only performed with nine second-grade students. A larger number in the study might yield different data confirming or refuting the findings of this study.
- A quantitative study could be performed to test the positive results generated by this case study and narrow the results to reflect the rhythmic intervention.
- The study took place over a six week period with 12 interventions. A longer time frame or more interventions could produce dissimilar or more information.
- The design of the program could be altered to include reinforcement in the general education classroom on a daily basis. A short prepared daily exercise might give varied results. Moreover, the study could include the general education students’ perception of the intervention.
- The curriculum of the program could be varied. The hand-clapping exercises were very popular with the children. They taught rhythm, small motor skills, rhyme, and interaction between the students. A study designed around this singular aspect of the program might prove helpful.

**Summary**

During this intrinsic, holistic case study I described and analyzed the experience of second-grade students at-risk of literacy failure of state mandated reading tests utilizing a rhythmic intervention. I answered three research questions through observations of 12
interventions, interviews with students and teachers, and analysis of artwork from students.

Through this process I identified five themes: Attention, Connection, Confidence, the Interventionist, and the Curriculum.

All of the students improved in their reading over the bounded time period. However, the children were receiving other interventions; nevertheless, the results cannot be discounted. Every student improving in reading is noteworthy and invites further study.

Clearly the students enjoyed the intervention. This was demonstrated in three of the themes. The connection the students felt for each other was strong, and they were concerned when a fellow student missed a class. If a student was not in the regular classroom, they were anxious to retrieve that participant. Furthermore, the students liked the activities in the intervention and were engaged participants. They particularly enjoyed adding to parts of the lesson. Finally, the students bonded well with the interventionist. They were unfailingly glad to see me and sought personal attention in the classroom.

The teacher participants were generous with their time though weighed down with a great deal of compilation of data. One teacher noted combined planning time became a consolidation of data and its meaning versus true co-planning for the second-grade. The teachers desired more information on the program and were willing to implement portions with the general education students as well as give reinforcement to the children in the study.

This was made clear in the last interview with one teacher. I sat in her room the last day of school surrounded by a teacher closing down her room. However, this was more than the standard cleaning up the room; she was retiring. She had taught 20 years and was planning to spend more time with her family, but this was not the sole reason for her retirement. She could not work with the high-stakes oriented teaching atmosphere in today’s classroom. She was
frustrated with the inability to make all children succeed at the same level at the same time. She was articulate and knowledgeable about her students and passionate about what would work with them. She was also clear that the answers to a child’s problems were not necessarily clear. One day the student would have the concept and the next you were re-teaching.

Despite the heavy work-load, she was the most vocal on more parts of the intervention being used in the classroom. She made the following statement.

You know, teachers don't mind doing anything if they know how to do it, and if it’s quick. You don't have to get out a bunch of stuff. I don’t want to get out the balls, whatever you do. If there was a quick little poem with the rhythm, we’d just do that real quick before we start reading to get them focused, that would be perfect, there's a lot of behavior things like that where before they start learning you give them all kinds of brain games, it's fun. School has to be fun sometimes, too. If it only takes five minutes. It's a big deal. Even with good readers, there’s words they don't know. The rhythm, the brain working, I just think that’s the point. (Mary, Week 6 interview, June 4, 2015)

The study clearly showed, by the five themes, the truth of Mary’s statement of the students’ needs and the teachers desire to meet those needs. The student participants wanted and needed the attention. They needed the connection with their peers. Additionally, with engagement in the curriculum and with the interventionist, they became more confident in their abilities. Furthermore, the students generally perceived they were improving in the rhythm and with their reading. The days they had the intervention were days the participants stated more enjoyment of school. The study correlated with other data (Bolduc, 2008; Bond, 2012; Cole, 2011; Foran, 2009; Hallam, 2010; Hyde et al., 2009; Overy et al., 2003; Posner & Patoine, 2009; Standley, 2008) noting improving academic performance through the use of rhythm as a tool to
facilitate learning in the classroom. Additionally, this intervention implied an improvement in classroom culture for the students which can produce greater receptiveness to academic success and personal enjoyment.
REFERENCES


Research and Development Centers Program. Retrieved from
http://www.ciera.org/library/instruction/principles/


http://dx.doi.org/10.1353/lib.0.0024


http://dx.doi.org/10.12738/estp.2013.3.1.1499


http://dx.doi.org/10.1177/87551233050230020104


http://dx.doi.org/10.1016/j.bandc.2012.04.008


http://dx.doi.org/10.2753/res1060-9393490908


http://dx.doi.org/10.1093/mtp/30.2.141


http://dx.doi.org/10.1080/01443410903560922

http://dx.doi.org/10.1080/00098655.2013.833494

Brettell (Ed.), When they read what we write: The politics of ethnography (pp. 121-129).
Westport, CO: Bergin and Garvey.


Houston, S. (2011). The first writing: Script invention as history and process. New York, NY:
Cambridge University Press.


Hsu, H. (2013). Middle school science teachers’ confidence and pedagogical practice of new
http://dx.doi.org/10.1007/s10956-012-9395-7
Hudziak, J. J., Albaugh, M. D., Ducharme, S., Karama, S., Spottswood, M., Crehan, E., . . .


http://dx.doi.org/10.1177/0741932508324403


http://dx.doi.org/10.1080/03004430802550755

http://dx.doi.org/10.1080/15401383.2012.711712


http://dx.doi.org/10.1002/ev.223


Slater, J., Tierney, A., & Kraus, N. (2013). At-risk elementary school children with one year of classroom music instruction are better at keeping the beat. *PLOS One, 8*(10), e77250-e77250. http://dx.doi.org/10.1371/journal.pone.0077250


Retrieved from http://www.ebrary.com


http://dx.doi.org/10.1177/8755123308322270


http://dx.doi.org/10.1177/1053451212472231


November 1, 2014

[Name]
Superintendent

Dear [Name],

As a graduate student in the School of Education at Liberty University, I am conducting research as part of the requirements for a Doctoral of Education. The title of my research project is

Facilitating Literacy Acquisition in At-Risk Second-Grade Students Using a Rhythmic Intervention: A Case Study. The purpose of my research is to discover the effect of a rhythmic only intervention on second-graders at-risk of failure on the state mandated I-Read testing.

I am writing to request your permission to conduct my research at [Name] Elementary School. Participants will be selected by the school staff as at-risk of failure in the spring I-Read testing. They participants will receive twelve, 30 minutes sessions over six weeks of the rhythmic intervention. The data will be used to demonstrate the students and their teachers’ perception of their reading ability after the program. The case study will also include data from the students. Participants will be presented with informed consent information prior to
participating. Taking part in this study is completely voluntary, and participants are welcome to discontinue participation at any time.

Thank you for considering my request. If you choose to grant permission, please respond by email to dmjones@hammond.k12.in so that we can proceed with a signed statement indicating the district’s willingness to participate in this research.

Sincerely,

Debbie Jones-Gensel

Choral Director/Music Teacher
Appendix B

Teacher Consent Form

Facilitating Literacy Acquisition in At-Risk Second-Grade Students Using a Rhythmic Intervention: A Case Study.

Principal Investigator: Debbie Jones-Gensel

Liberty University

School of Education

You are invited to be in a research study of the effect of a rhythmic-only intervention on second-graders at risk of failure on the state-mandated I-Read testing. You were selected as a possible participant because you are a second-grade teacher at [redacted] Elementary School. I ask that you read this form and ask any questions you may have before agreeing to be in the study.

Debbie Jones-Gensel, a doctoral candidate in the School of Education at Liberty University is conducting this study.

Background Information:

The purpose of this study is to discover the effect of a rhythmic-only intervention on second-graders at risk of failure on the state-mandated I-Read testing. Previous studies have shown a link between the ability to replicate rhythm and reading.

Procedures:

As a teacher, if you agree to be in this study, I would ask you to do the following things: Select students you feel are in need of remediation in reading from your class. The student/participants will have twelve, 30 minute rhythm lessons over a 6 weeks period. They will also be asked to respond in individual interviews through a prescribed set of open-ended questions at week 3 and week 6. Additionally, the students will be asked to draw pictures of the rhythmic intervention at week 6 and asked to describe the pictures through a prescribed set of open-ended questions. The interviews should be no more than 10 minutes in length for each session.

All the sessions, whether the intervention or interview, will be videotaped. This is to ensure accurate transcription of the participants’ thoughts. The lessons will be videotaped because the researcher will be performing the intervention. Data will consist of transcripts from these video tapes, the pictures drawn by the students, and data from the students’ assessments in reading through the school. The intervention will take place twice a week for six weeks. The sessions will last 30 minutes each. Additionally, books about rhythm will be available for you to utilize in your lesson plans as you desire. You will be asked to participate in an individual 10-minute interview through a prescribed set of open-ended questions conducted at week 3 and week 6 about your perceptions of the success of the program in the children both in literacy acquisition and ability of the student participants to focus in school after the sessions. Lastly, you will be asked to participate in a 10-minute group interview at the end of the study. You will be asked
about the group’s perception of the program on the students both in literacy acquisition and the ability of the student participants to focus in school after the sessions. The interviews will be recorded to ensure accurate transcription of your thoughts.

Risks and Benefits of being in the Study:

The study has minimal risks, which are no more than you as the participant would encounter in everyday life. The teacher participants are not expected to receive a direct benefit from the study.

Compensation:

Teachers will receive Professional Growth Points (PGP) per hour for involvement in the study.

Confidentiality:

The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a subject. Research records will be stored securely and only the researcher will have access to the records. The data will be kept in a locked cabinet or under password protection. The recordings of interviews will be viewed only by the researchers, transcriber, and committee on an as-needed basis. The recordings are to ensure accurate replication of data. The participants will also have the opportunity to review materials to guarantee they accurately reflect the individuals’ thoughts. The materials will be maintained for the required three year period. Additionally, pseudonyms and compilations will be used for all teachers, students, and setting to maintain confidentiality and privacy. However, the researcher cannot guarantee complete confidentiality as other members of the study may discuss findings and procedures.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University or the School . If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

How to Withdraw from the Study:

You can withdraw by contacting Debbie Jones-Gensel at dmjones@hammond.k12.in.us, djonesgensel@liberty.edu or (219) 614-9058. Please state if you are withdrawing from future participation in the research or from the complete study. The first allows use of previously gathered data in your interview, or if you would like all collected data will be destroyed.

Contacts and Questions:

The researcher conducting this study is Debbie Jones-Gensel. You may ask any questions you have now. If you have questions later, you are encouraged to contact her at dmjones@hammond.k12.in.us, djonesgensel@liberty.edu or (219) 614-9058. The advisor for this study is Dr. Randy Tierce, krtierce@liberty.edu or (940) 441-2378.
If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, you are encouraged to contact the Institutional Review Board, 1971 University Blvd, Suite 1837, Lynchburg, VA 24515 or email at irb@liberty.edu.

Please notify the researcher if you would like a copy of this information to keep for your records.

Statement of Consent:

I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

(NOTE: DO NOT AGREE TO PARTICIPATE UNLESS IRB APPROVAL INFORMATION WITH CURRENT DATES HAS BEEN ADDED TO THIS DOCUMENT.)

☐ The researcher has my permission to video-record me as part of my participation in this study.

Signature: ___________________________ Date: _________________

Signature of Investigator: ___________________ Date: _______________
Appendix C

Assent of Child to Participate in a Research Study

What is the name of the study and who is doing the study?

Facilitating Literacy Acquisition in At-Risk Second-Grade Students Using a Rhythmic Intervention: A Case Study by Debbie Jones-Gensel

Why are we doing this study?

We are interested in studying to see if learning rhythm all by itself can help children learn reading.

Why are we asking you to be in this study?

You are being asked to be in this research study because you are a second-grader at [Redacted] Elementary School who is still learning to read.

If you agree, what will happen?

If you are in this study, you will take a 30 minute class in rhythm 2 times a week for 6 weeks. The class will have other students in second grade, and you will study rhythm.

Do you have to be in this study?

No, you do not have to be in this study. If you want to be in this study, then tell the researcher. If you don’t want to, it’s OK to say no. The researcher will not be angry. You can say yes now and change your mind later. It’s up to you.
Do you have any questions?

You can ask questions any time. You can ask now. You can ask later. You can talk to the researcher. If you do not understand something, please ask the researcher to explain it to you again.

Signing your name below means that you want to be in the study.

_________________________________________________

________________________________

Witness          Date

Debbie Jones-Gensel, djonesgensel@liberty.edu, (219) 614-9058

Advisor: Dr. Randy Tierce, krtierce@liberty.edu, (940) 441-2378

Liberty University Institutional Review Board,

1971 University Blvd, Suite 1837, Lynchburg, VA 24515

or email at irb@liberty.edu.
Appendix D

Parent Consent Form

Facilitating Literacy Acquisition in At-Risk, Second-Grade Students Using a Rhythmic Intervention: A Case Study.

Principal Investigator: Debbie Jones-Gensel

Liberty University

School of Education

Your child is invited to be in a research study of the effect of a rhythmic-only intervention on second-graders at risk of failure on the state-mandated, I-Read testing. He or she was selected as a possible participant because he or she is a second-grader at [Redacted] Elementary School. I ask that you read this form and ask any questions you may have before agreeing to allow your child to be in the study.

Debbie Jones-Gensel, a doctoral candidate in the School of Education at Liberty University, is conducting this study.

Background Information:

The purpose of this study is to discover the effect of a rhythmic-only intervention on second-graders at risk of failure on the state-mandated I-Read testing. Previous studies have shown a link between the ability to replicate rhythm and reading.

Procedures:

The student/participants will have twelve, 30 minute rhythm lessons over a 6 week period. They will also be asked to respond in individual interviews through a prescribed set of open-ended questions at week 3 and week 6. Additionally, the students will be asked to draw pictures of the rhythmic intervention at week 6 and asked to describe the pictures through a prescribed set of open-ended questions. The interviews should be no more than 10 minutes in length for each session.

All the sessions, whether the intervention or interview, will be videotaped. This is to ensure accurate transcription of the participants’ thoughts. The lessons will be videotaped because the researcher will be performing the intervention. Data will consist of transcripts from these video tapes, the pictures drawn by the students, and data from the students’ assessments in reading through the school.

As a parent, if you agreed to allow your child in this study, you will sign this form and return it to your child’s teacher. This will allow your child to take part in the study and give access to his or her school records. The records will only be used for comparison in this study; the names will only be seen by the researchers. Additionally, the description of the participants will be list as Student A, Student B, etc. The class will take place during school hours.
Risks and Benefits of being in the Study:

The study has minimal risks and is no more than your child, as the participant, would encounter in everyday life. The benefits to the student include an exposure to rhythm and possible help in reading. Additionally, the study could benefit other students by helping teachers better understand how the mind learns to read.

Compensation:

Student participants will not be compensated for their involvement outside of added musical training.

Confidentiality:

The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a subject. Students will be given numbers rather than names in the case study. Research records will be stored securely and only the researcher will have access to the records. The data will be kept in a locked cabinet or under password protection. The recordings of interviews will be viewed only by the researchers, transcriber, and committee on an as-needed basis. The recordings are to ensure accurate replication of data. The materials will be maintained for the required three-year period. Additionally, pseudonyms and compilations will be used for all teachers, students, and setting to maintain confidentiality and privacy.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision as a parent to allow or not allow your child to participate will not affect your current or future relations with Liberty University or the School City of Hammond. If you decide to allow your child to participate, he or she will be free to not answer any question or withdraw at any time without affecting those relationships.

How to Withdraw from the Study:

You can withdraw your child by contacting Debbie Jones-Gensel at dmjones@hammond.k12.in.us, djonesgensel@liberty.edu, or (219) 614-9058. Please state if you are withdrawing from the primary research only, which allows use of previously gathered data, or if you would like all collected data destroyed.

Contacts and Questions:

The researcher conducting this study is Debbie Jones-Gensel. You may ask any questions you have now. If you have questions later, you are encouraged to contact her at dmjones@hammond.k12.in.us, djonesgensel@liberty.edu, or (219) 614-9058. The advisor for this study is Dr. Randy Tierce, krtierce@liberty.edu, or (940) 441-2378.
If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, you are encouraged to contact the Institutional Review Board, 1971 University Blvd, Suite 1837, Lynchburg, VA 24515 or email at irb@liberty.edu.

Please notify the researcher if you would like a copy of this information to keep for your records.

Statement of Consent:

I have read and understood the above information. I have asked questions and have received answers. I consent to allow my child to participate in the study.

(NOTE: DO NOT AGREE TO PARTICIPATE UNLESS IRB APPROVAL INFORMATION WITH CURRENT DATES HAS BEEN ADDED TO THIS DOCUMENT.)

☐ The researcher has my permission to video-record my child as part of my participation in this study.

Signature of parent or guardian: ____________________ Date: ______________

Signature of Investigator: __________________________ Date: ____________
Appendix E

Literary Resources


### Observation Protocol

<table>
<thead>
<tr>
<th>Sample observation protocol</th>
<th>Length of activity: 30 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive notes</td>
<td>Reflective notes</td>
</tr>
</tbody>
</table>

(Creswell, 2013)
April 1, 2015

Deborah May Jones-Gensel
IRB Approval 2115.040115: Facilitating Literacy Acquisition in At-Risk, Second-Grade Students Using a Rhythmic intervention: A Case Study

Dear Deborah,

We are pleased to inform you that your above study has been approved by the Liberty IRB. This approval is extended to you for one year from the date provided above with your protocol number. If data collection proceeds past one year, or if you make changes in the methodology as it pertains to human subjects, you must submit an appropriate update form to the IRB. The forms for these cases were attached to your approval email.

Thank you for your cooperation with the IRB, and we wish you well with your research project.

Sincerely,
Appendix H

Intervention Reflections and Observations

Intervention Lesson 1-Friday, April 24, 2015

Reflection

The class consisted of 8 of the 9 students. One was absent. We demonstrated several different things we would be doing in the class.

- We started with the metronome. The children clapped the various speeds. We used the balls to try and work with the rhythm. The children worked with partners, but that did not work well. I think there will have to be a different method for this activity.

- We then clapped the children’s first and last names (We will do middle names later). One was particularly long, and I saved it for last. The children were not necessarily on at the beginning but all were able to do each name with just a small amount of repetition. The children started using body claps, so we did inventive rhythm.

- The buckets were a big hit. I’m glad I saved the sticks for the second time. They were good to put their hands on their legs when I told them to. They worked on echoing what I did, and then echoed each other. I was surprised at the detail they copied. Not just the rhythm itself but how it was struck with the various hands.

- We finished with The Drums of Noto Hanto. They liked the fact it was a true story. I need to time how long it takes to read the book so we end on time.

- The children seemed to really enjoy the lesson and were very sweet.
• I plan to do same and different sounds, hand clapping game, and movement to a march next time.

Descriptive Notes

The class was introduced to the metronome. Entrainment of the beat started each class, and that was generally with the metronome. The class started with the soccer balls. There was a ball for each 2 children. They passed the balls back and forth depending on the rate of the metronome.

The class next moved to clapping individuals first and last names. This was a good way for me to learn their names and see how they did with clapping rhythm. The children were very helpful in saying the last names of their classmates. These children are from 3 different rooms, yet they seemed very familiar with each other. The names were clapped on hands, head, thighs and stomped with feet.

The buckets were then introduced but without the sticks. The students were taught how to echo the sound as they heard it. While we were doing the drum echo, they learned to match the timing of the beat as clapped. This set them up to beat the drum in the same timing.

*The Drums of Noto Hanto* was our book. The kids moved around at first but then settled down.

Michael had to be encouraged to participate. Also Gabriel was more of an observer this day. He became more engaged as the intervention moved forward.

**Intervention Lesson 2-Tuesday, April 28, 2015**

**Reflection**
The class consisted of 7/9 students. Two were absent. They students were very cooperative.

The staff has made real efforts to help me by letting students change reading interventions and speech times.

We started with saying everyone’s names with middle names. They students had a harder time with these than the first and last; however, after several attempts all were able to stay in time. We used a variety of body percussions including a finger together-palm move one of the girls came up with.

The hand clapping game went well. We went over the rhyme and the students were able to say it. I worked with each one individually. Next time the students will work with each other on the clapping.

The sticks were new today and were very popular. We did an echo game with initial imitation by me and then each child had a chance to make up a rhythm. We counted off my 4 with the sticks being hit together. Then the students clicked off 4 and tried to do the same rhythm. Sometimes the rhythm needed clarification. Students were also particular about how the buckets were struck whether that be right-left or side-top.

We concluded with I like the Music. The students seemed to like the book and were interactive in the reading.

**Descriptive Notes**

The students like to make up different rhythms. I find they participate better when they have a say in the lesson. This time they linked their hands together and popped the palms together. Also clicking the tongue.
The class was interrupted by someone asking me a question. The students continued to work on the Double Double hand clap rhythm. You could start to see how the girls especially took to this part of the program.

The students got their sticks in this intervention. They were quite excited about it! We worked on echo tapping. Style was important to the students. If someone hit the buckets on the side or hit the top with one or two sticks, they felt that was part of matching the rhythm. This was a hard concept for them to let go of throughout the interventions. I introduced the same and different two measure concept that we would use and they would make up in the next lesson.

One of the few lessons we didn't use the metronome for entrainment.

After the first lesson, I would read and time the books, so I would have an idea of the amount of time to save. "The conductor looks like a dragon." (A comment about the formal tails on the conductor from a student.)

**Intervention Lesson 3, Friday, May 1, 2015**

**Reflection**

While I tried to leave the school early, I had a phone call on the way out the door. It made a stressful day more stressful! 8 of the nine children participated: Cody, Ethan, Cameron, Jacob, Gabriel, Jada, Mia, and Isabella. I have noticed that certain students are starting to participate in their own way or not participate. Gabriel likes to make a rhythm that is his own rather than do the beat. Also Ethan will simply not participate in what I believe are activities he does not feel comfortable in doing.
One problem was not turning on the video recorder until we were done with the first activity. I forgot the MM, so we made up beats to match and the speed the student desired. I first modelled the activity with 4 beats given. Then I speed up the beat or slowed it down and had the children follow when that was done. Then the students made up a rhythm. They had problems keeping it to 4 beats at first, but did get the hang of it. They enjoy making it harder by using different parts of the body in the set.

We then did the clapping rhyme: *Double Double*. Jada and Mia are actually quite good at this one. They have the words and clapping down well. I’m impressed they remembered it over the one time we have practiced it. I did the hand clap with each student while they were paired off. Ethan did not want to do the exercise with his partner.

I had made up signs with same suns and different stars. The students turned to which one they heard. We then let students make up a pattern and either repeat or differ. Again this was 4 beats. They seem to prefer different. At first a few missed, but they soon got the hang of it.

I finished with the story. The students participated well in prediction.

**Descriptive Notes**

As stated above, I forgot to turn on the video recorder at the beginning of the class. The description of the first exercise is accurate.

When we started the hand clapping segment, I noticed Ethan only does when you are encouraging him. Jacob had not heard the hand clap before as he was absent the day before; however, he picked up the hand clap well.

**Intervention Lesson 4, Tuesday, May 5, 2015**
Reflection

I had 8/9 students: Cameron, Cody, Jada, Mia, Isabella, Gabriel, Michael, and Ethan. The students were glad to see me and anxious to get started. Michael had not had his ADD Rx. We used the metronome and people set the beat: Jada, Isabella, Michael, and Ethan. Cameron, Cody, and Mia will get a turn next time. We used body beats. I have to watch that Gabriel and Michael are on task.

We did *Double Double*. The kids are really getting this one. Michael missed last time and didn’t do as well. This is a hard concept for Ethan.

We did Same and Different beats. The students took turns and I introduced writing in the simplified notation.

We “read” *The Jazz Fly*. The kids were really crazy about this one. They liked the music!

Certain of the students are really picking up on the concepts: Jada, Mia, and Cody. Cameron is pretty quiet but he also stays up. Gabriel, Michael, and Ethan seem to be lost at times.

Descriptive Notes

It was hard for the students to keep the slow tempo. They wanted to speed up.

The students really struggled this first day staying with the MM.

There was a distracting lightning storm during the class. I got SOAKED on the way back to the car!
The students struggled with the written rhythm until I gave them the Kindermusik words: Brown Bear, Butterfly, caterpillar, woodpecker. Then they did great.

Kids loved The Jazz Fly. They were really moving to the beat and pretended to play instruments.

**Intervention Lesson 5, Friday, May 7, 2015**

**Reflection**

Students in attendance 8/9: Isabell, Ethan, Gabriel, Cody, Jacob, Cameron, Mia, and Jada.

The students were good and eager to be a part of the class. We were in a part of the stage so I could not do the body movements I had wanted. We started with MM and matching the beat with me, then the students who did not have a turn last time set the tempo and we clapped with them. The students are getting good at this although some need to be reminded to listen to the beat and not just start. This is especially a problem with faster beats. We talked about the big movements for slower beats.

We did same and different beats with the buckets. The students want the rhythm and the way they did the beat to count as same and different. We use the papers to show same and different. Then the students did the buckets. Again the students are doing very well.

All the students can to the *Double Double* very well. I’m most impressed! We only have 2 times a week to go over it.

We start the *Dancing Drum: A Cherokee Legend*, but we could not finish. We will do so in the next lesson.
Descriptive Notes

Students do much better on matching the rhythm with the MM. There is a marked difference from the beginning. I would say 5th lesson is a watershed moment in this area.

We started the same and different with the papers to show the choice and myself playing the examples. Then we passed out the drums and sticks. Jacob is starting to put his fingers in his ears with the noise. He also brought out his first toy in class to show me.

The student then combined all the elements in tapping same and different for their fellow students. We then had to say if same or different and then do it back. The real struggle was again with style being a part of whether it was the same or different rhythm.

We entrained the beat with the students following me in speed which varied. Students need to work on slower speeds taking more time.

We did not finish the book due to time.

Intervention Lesson 6, Tuesday, May 12, 2015

Reflection

I had 6/9 students today. Isabella and Ethan were absent. Jacob was having problems and was isolated. Today was the ½ way mark, and I will need to start interviews. I forgot to turn on the video, so I missed about the first 10 minutes. The students are getting good at matching the metronome beat. They enjoy setting the tempo, and I have to keep track of who does things! We tried moving the balls in a circle to the beat and then in pairs. They did much better in the group. We used a movement to the beat number, Billy the Kid: Gun Battle. They enjoyed the
movement to the music; I’m not sure if it taught them anything, but they needed to move. We also started a new hand clap *Bim Bum*. The students are very proud of themselves for learning the first one so well. This one uses a song, so I will be interested if they find it easier. We did some writing of beats on the board. The students seem to understand the concept of the notes. We finished *Dancing Drum*. Particularly the girls will ask about the story.

**Descriptive Notes**

We started entraining the beat while passing the soccer balls to the beat. This is harder for the children. They do okay at a slower speed but just could not seem to get closer to pass quicker.

We then broke into groups of 2. This was an activity hard for the boys to control themselves.

I introduced the Bim Bum.

Music in movement to “Billy the Kid: Gun Battle”.

**Intervention Lesson 7, Friday May 15, 2015**

**Reflection**

All of the students were present today. I think that is the first time! We did everything on the list to do but groups in rhythm. Gabriel, Ethan, and Cameron will lose their stick privileges next time, because they did not do well with either their sticks or the balls. The balls seem to really get them excited. They love the hand clapping. The new one is going well. Next time we will learn the 2nd half.

We had two new ideas for rhythm. Hitting the back of the chair legs on the floor and putting the
bucket over the head for the echo. MM was Jada, Cody, Jacob, Cameron, and Gabriel. Beating for same and different was Michael, Ethan, Mia, and Isabella. We will swap next time.

I wasn’t able to finish the interviews due to technical difficulties with the computer. grgrgr! I hope to finish on Monday.

**Descriptive Notes**

I was able to tell the students what was the order of the lesson. This makes me happy. This day was Jada’s birthday. I keep noticing in the tape how much Jacob tries for individual attention.

The children really keep track of who gets a turn. I write things down so it will be equal. I believe attention will be a theme in the dissertation. Jacob is separating himself as the drums begin. We are in the gym room.

Same and different sounds with the sticks crossed for different and parallel and upright for same.

Continuing teaching Bim Bum.

Ethan and Michael will sing even if they won't step out on the rhythm. They love when I mess it up!

The balls being passed in a circle was very difficult for them. They couldn't seem to get the concept. Perhaps it was that we had all the students there. They finally got the moderate speed one.

**Intervention Lesson 8, Tuesday May 19, 2015**

**Reflection**
We only had 6/9 students today due to testing. Jacob, Mia, Cody, Cameron, Isabella, and Michael. Cameron was serving his no-sticks day. Isabella was a little wild. I’m not sure the problem. The kids loved the movement to the rhythm with “The Aquarium”. The boys made themselves sharks with their scarves! The children are getting really good at the matching MM or any beating I do. Isabella, Michael, and Cody wrote music for others to follow. They like the Bim Bum song however, they like the clapping with each other. The book was a big hit.

Descriptive Notes

Jacob's idea was to put bucket over the head and match the beat.

We drew rhythm and the students then beat each other’s. We had a butterfly-woodpecker. That was very difficult for the students.

Michael doesn't really like the Bim Bum because he isn't good at it.

Second theme could be confidence. The students perceive themselves as better and that could be a factor in how they do in school.

Cameron who did not have sticks today did not participate real well.

The students really like the pictures in The Jungle Drums. They participate so well!

Intervention Lesson 9, Friday, May 22, 2015

Reflection

7/9 children were there today: Jacob, Cody, Michael, Ethan, Gabriel, Jada, and Isabella. The video recorder was out of room!!
Because the children mentioned the balls were hard, we did the rhythm entrainment by passing the ball. I set the MM and moved it up gradually. We stopped at 120 because we couldn’t keep it in time then. They needed to say something to get the time. We started with “pass”, but they eventually thought “1, 2, 3, 4” was better.

We reviewed *Double This That* and continued with *Bim Bum*. They are starting to get it pretty well. Michael seems a little lost, but with encouragement, he is doing pretty well.

Then we had Jacob, Michael, Ethan, and Mia set a beat, and we all followed what they were doing. We varied speeds. While type of rhythm counting was not required, most students tried to match their style of clapping.

We then let Cody, Gabriel, and Jada count four beats for us to match with the sticks. I did not use the buckets today. Cody went first. When it was Gabriel’s turn, he counted off 4 before beginning and that was a popular choice. Jada did the same. We started *Gabriella’s Song*, but we ran out of time and will have to finish on Tuesday. Cody was a great line leader back to the rooms!

**Descriptive Notes**

The video recorder was not in the room, so the reflection notes must stand on their own. I was thorough.

**Intervention Lesson 10, Tuesday, May 26, 2015**

**Reflection**
We only had 5 of the students as 3 had NWEA testing and 1 was absent: Mia, Isabella, Cody, Cameron, and Michael. In some ways that made it more difficult, Isabella was again active. She lost sticks for next time. We used the sticks to match the MM. Again they need to stop and listen before starting. It is rather hard to hear, and I think that makes judging the sounds more challenging. They do well as soon as they hear me. All the children had a chance to set the MM. The kids suggested beating on the balls. It is doable, but we need to share balls. We counted off by 4 and children made up the beat. Also students wrote notation on the board for other children to play. They are really improving in this area. We do the Kindermusik counting words. Also did #2 on the listening CD. We pretended to be skaters. The girls do much better focusing on this activity. We reviewed *Double This* and *Bim Bum*. Again the children are doing well on this activity. We finished the book.

**Descriptive Notes**

The video was not set for about the first half of the class. See above notes in reflections. I noted that Michael is doing much better in the *Bim Bum*. We finished *Gabriella's Song*. This is the one of the ones Isabella borrowed.

**Intervention Lesson 11, Friday, May 29, 2015**

**Reflection**

Kimberly’s class had NWEA. I started with only three (Jada, Ethan, and Gabriel) and then four more joined (Cody, Michael, Jacob, and Cameron). Isabella will have the consequence of losing her sticks next time. Mary’s class had earned an extra recess due to hands off policy, so the students were late. The students’ behavior continues to be a problem. I needed to have set
clearer boundaries in the beginning. They were super good the first half; now they have gotten more “comfortable”. They do not like to lose their sticks. I need to implement that consequence more often. We started with the MM and beating the balls with a stick. This was very successful. We did the match the pattern. The students are still hung up on matching exactly the way the student performance. We went through the *Double This That*. Ethan is still not quite on with it, but the others are doing well. *Bim Bum* is going well except for Michael. He doesn’t want to try it very well. I have to really encourage him. The kids are great at the song, and I think they do the motions better than me. They like the counting in Japanese in today’s book. Lastly, we were on the stage today and there were no chairs. We turned the buckets over and used them as seating. It smelled like milk products. Apparently, they had a pie throwing contest on the stage, and that is why the floor was so sticky.

**Descriptive Notes**

This was an unusual class as the floor in the gym was so sticky and we had to use the buckets as seats also. You can really tell there is only 1 week of school!

Kids are really starting to sing the *Bim Bum*. This is helping them learn the movements.

Jacob likes to whistle for attention.

Gabriel on Same and Different - "He got a space" to describe the difference in sound.

Also they used the balls as something to show same and different. Also they use fingers instead of sticks or pieces of paper to demonstrate same or different.

Jacob really likes to comment on the book and attract attention to himself or control the story.
Intervention Lesson 12, Tuesday, June 2, 2015

Reflection

We had 7/9 students. Isabella and Mia were not in their classroom. The whole group was gone, and I don’t know where they were. Three of the boys from Karen’s class had drawn pictures. Hopefully the other classes will follow through.

It was an unusual day. I had a colleague at my school had a mental breakdown literally in front of myself and the students. It was very disturbing. He was not violent. As I consider him a dear friend, it was very difficult to finish the day. I had to cancel the morning session and do in the afternoon. Additionally we were in a different alternate room than any other time. I think this made a difference in the children’s behavior, and it affected how the lesson plan was done. I could not use the buckets even without the sticks as there were two classes nearby. The teachers were both great about the noise, but I did not want to push it.

We started by matching MM. We used one stick on a ball. All but 1 had to share. Next we tried passing the ball. The kids love to pass it fast, but it is very difficult to do. We did both clockwise and counterclockwise. Next we had students write a rhythm on the board for the other students to do. They had gotten quite good at these using Kindermusik terminologies. Next we moved to “Flight of the Bumblebee”. The movement to music has been a disappointment in what I was aiming for. The students generally want to run-around the room! We did talk about being bees, getting nectar, stinging, being worker bees. Last we closed with Zin, Zin, Zin, a Violin. I had deliberately closed with this one, but the kids didn’t seem to like it very well. Their favs by far are The Jazz Fly and The Ten Oni. I gave those books to Karen. I will start interviews tomorrow.
**Descriptive Notes**

School is going to end in 2 days.....it certainly shows in the students!

The one class that shared a door with us did not have children in it for our 30 min class; however, we kept it quiet for the class for discipline problems.

When passing the ball to the MM, Jacob again is making a big production of doing something. He is really looking for attention.

Again Jacob is trying to get the other children to close their eyes before an activity.

The kids want the program again last year.

Cody played a same and different. He played brown bear, brown bear, but the first time was slow and the second time was fast. The kids discussed it if was really different.
Appendix I

Comparison of Frequency of Themes

Comparison of Frequency of Themes

- Attention
- Confidence
- Connection
- Interventionist
- Curriculum
Appendix J

Sample Lesson Plan

Lesson Plan:

Clap/tap/snap/body percussion/etc the “new” students name and then do each person with their middle name.

*Double Double this this*
*Double Double that that*
*Double this*
*Double that*
*Double Double this that*

Teach the students the above rhythm with motions. This is one we will be doing several times until they feel comfortable with the rhyme.

Use the bucket to tap same/different measures.

Pass out sticks to students and do match the metronome. They will need to tap quietly to listen. Then do echo sounds. Let the students have the chance to lead.

7 minutes for *I like the Music*

State Academic Standards for Music

2.2.1 Echo melodic and rhythmic patterns.

2.2.2 Maintain a steady beat and play with appropriate dynamics levels.

2.2.3 Play classroom instruments with the proper technique, holding them correctly.

2.2.6 Follow the cues of a conductor with regard to the tempo and dynamics. 2.3.3 Respond to teacher or student questions by singing and using body percussion, movement, found items, instruments, or electronic sounds.

2.4.1 Perform short rhythmic and melodic phrases within the teacher guidelines and write them using standard or original notation.

2.4.3 Arrange and perform a short sound piece cooperatively in small groups using the voice, body percussion, found items, or instruments.

2.5.1 Read and perform quarter, eighth, half, dotted half, and sixteenth notes, and quarter and half rests in four-beat groupings using rhythm syllables.
2.6.1 Identify contrast and changes in tempo and dynamics using basic music terminology and movement.

2.8.2 Describe an aural musical example through movement, art, or writing.

Second Grade Reading Standards

2.RL.2.1 Ask and answer questions to demonstrate understanding of main ideas and key details in a text.

2.RL.2.2 Recount the beginning, middle, and ending of stories, including fables and folktales from diverse cultures, and determine their central message, lesson, or moral.

2.RL.2.4 Make predictions about the content of text using prior knowledge of text features, explaining whether they were confirmed or not confirmed and why.

2.RL.4.1 Use information gained from the illustrations and words in a print or digital text to demonstrate understanding of its characters, setting, or plot.

2.PV.3.1 Recognize that authors use words to provide rhythm and meaning in a story, poem, or song.

2.SL.1 Listen actively and adjust the use of spoken language effectively with a variety of audiences and for different purposes.

2.SL.2.1 Participate in collaborative conversations about grade-appropriate topics and texts with peers and adults in small and larger groups.

2.SL.2.3 Listen to others, take one’s turn in respectful ways, and speak one at a time about the topics and text under discussion.

2.SL.2.4 Ask for clarification and further explanation as needed about the topics and texts under discussion.

2.SL.2.5 Build on others’ talk in conversations by linking comments to the remarks of others.

2.SL.3.2 Ask and answer question about what a speaker says to clarify comprehension, gather information, or deepen understanding of a topic or issue.

2.SL.4.1 Using appropriate language, recite poems and rhythms, and tell a story or recount an experience, in an organized manner, with appropriate facts and careful attention to sensory details, speaking audibly in coherent sentences and at an appropriate pace.

2.SL.4.3 Give and follow multi-step directions.
Appendix K

Student Academic Reading Data

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General education expectation of second grade is M in Reading Running Records (RRR) and 420 in Scholastic Reading Inventory (SRI).