THE EFFECT OF LOCOMOTOR AND NON-LOCOMOTOR MOVEMENT IN RESPONSE TO MUSIC AMONG FIVE AND SIX YEAR OLDS

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CULTURAL CENTER
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THE EFFECT OF LOCOMOTOR AND NON-LOCOMOTOR MOVEMENT IN RESPONSE TO MUSIC AMONG FIVE AND SIX YEAR OLDS

ABSTRACT

Movement involvement in music is a concept widely recognized by many well-known music educators such as Zoltan Kodaly, Carl Orff and Emile Jaques-Dalcroze. Teaching music with movement is especially effective for young children (Pound & Harrison, 2002). Young children develop the understanding of musical elements by involving movement (Carlson, 1980). This study was conducted to find out the difference between various movement categories in response to music among 5- and 6-year-old children. The two movement categories focused on this study were locomotor and non-locomotor movement. Sixty-one children aged five to six from a music centre and two kindergartens in the Klang Valley participated in this study, and were randomly assigned into either one of the groups, locomotor or non-locomotor. Children attended a total of six one-hour lessons, with either a locomotor or non-locomotor movement treatment. The study was conducted on a weekly basis, excluding a pre-test and post-test session, which were scheduled before and after the six weekly lessons. Data from the pre-test and post-test were analysed based on different movement categories, age and gender. Children from both groups showed improvement in movement responses to music, however, there was no significant relationship found between locomotor and non-locomotor movement, and gender and movement in response to music. Therefore, gender was not an affective variable in this study.

Keywords: movements, locomotor, non-locomotor

KESAN-KESAN PERGERAKAN LOKOMOTOR DAN BUKAN LOKOMOTOR SEBAGAI TINDAK BALAS KEPADA MUZIK ANTARA KANAK-KANAK YANG BERUMUR LIMA DAN ENAM TAHUN

ABSTRAK

Gerakan dalam perbelajalan muzik adalah penting dan telah banyak digalakkan oleh pakar-pakar muzik seperti Zoltan Kodaly, Carl Orff dan Emile Jaques-Dalcroze. Pengajaran muzik yang terlibat dengan pergerakan amat berkesan dengan kanak-kanak (Pound & Harrison, 2002). Carlson (1980) juga berkata kanak-kanak dapat berlajar muzik dengan permahaman yang lebih mendalam. Kajian ini dijalankan untuk mengajian perbezaan pergerakan 'locomotor' dan 'non-locomotor' (bukan locomotor), dengan kanak-kanak yang berumur 5 dan 6 tahun. Enam puluh satu kanak-kanak dari dua tadika dan satu sekolah muzik dalam Klang Valley terlibat dalam kajian ini. Semua kanak-kanak diasingkan dalam kumpulan satu dan kumpulan dua secara rawak. Semua kanak-kanak terlibat dalam kelas pergerakan dengan muzik sebanyak enam jam, dalam enam minggu. Ujian pra dan ujian pos dijalankan sebelum dan selepas kelas yang selama enam minggu. Kanak-kanak dari dua kumpulan memingkatkan pergerakan yang menyegerakkan muzik, tetapi tiada perbezaan yang ketara di antara pergerakan 'locomotor' dan 'non-locomotor', dan jantina. Oleh itu, jenis pergerakan, dan jantina bukan faktor yang ketara.

Kata-kata kunci: pergerakan, lokomotor, bukan lokomotor

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Early childhood music education is important in nurturing musical learning by preparing young children with foundation experience of the primary elements of music (Retra, 2010). Very often, music is combined with movement in music classes for young children, especially in kindergarten, and also in well-known music curriculum such as Yamaha Music Wonderland, Kindermusik, Orff Schulwerk, etc. Many research studies were done to prove that movements help to develop cognitive and affective abilities (Gallahue, 1976), language (Nadon-Gabrion, 1984), music elements (Carlson, 1980), interpretation and communication (Styns, Noordenn, Moelants & Leman, 2007).

Movement is an important part of a young child's development of psychomotor, cognitive and affective abilities (Gallahue, 1976), for effective music learning (Pound & Harrison, 2002). Nadon-Gabrion (1984) stated that children are able to develop language perception through visual discrimination movement. When children play, fight or dance, these activities involve movement, and can help in developing an understanding of musical form, rhythm, tone colour, tempo and dynamics (Carlson, 1980). Children respond better through bodily movement compared to verbal responses (Van Zee, 1976, as cited in Alexander, 2006). Alexander (2006) also discovered that young children tend to demonstrate their understanding through body movements rather than verbal communication in musical concepts. Leman (2007, as cited in Styns, et al, 2007) also emphasized the relationship between body movement and cognition. Leman (2007) claimed that body movement served as a mediator for music perception.

Studies have shown that very young children learn through movement, and their senses (Blatt & Cunningham, 1975). Even jazz musicians often use physical motion to interpret

the expressive character of a performance during jazz improvisation, and to communicate the mood and soul of the piece to the audience (Seitz, 2005). Bodily movement is part of music. In fact, we tend to move our body when we are singing, blowing the flute, pressing the piano keys, or any other musical activity. Even listening to music may be accompanied by bodily movement (Styns et al, 2007).

Children express themselves naturally through bodily movement. They respond to music through jumping or bouncing from as early as one to two years of age (Gardner, as cited in Pound & Harrison, 2002). Children display interest in music by clapping, dancing, swaying of arms and bouncing. Although their response may not always seem accurate, Pound and Harrison (2002) claimed that this is usually limited by young children's level of motor development. Therefore, their musicality may be more than what they are able to demonstrate. When the children's bodily coordination increases at the age of three or four, they are able to demonstrate the awareness of beat and tempo physically, such as marching in time (Pound & Harrison, 2002). Children start showing an even greater awareness to rhythm at the age of four or five (Pound & Harrison, 2002). They can clap in an accurate rhythm more often and are able to interpret rhythm by dancing (Sloboda, as cited in Pound & Harrison, 2002). Most children are able to match movement to music and make use of body sounds, such as clicking and clapping, by the age of five (Pound & Harrison, 2002). Odam (2001) stated that by applying bodily movement, children greatly enhance their musical learning.

Odam (2001) reinforced that moving to music is natural and important in music learning with this statement "… there is nothing that you can hear in music that cannot somehow be expressed in movement." (p.21). Scholars agreed that music learning and enjoyment should include movement, dance and speech (Orff, 1964; Keetman, 1974, as cited in Swanwick, 1988). Dalcroze (1921, as cited in Swanwick, 1988) claimed that

rhythm and dynamics rely completely on movement, and all the nuances in time (e.t. accelerando, ritardando) and energy (e.t. crescendo, diminuendo) can be 'realized' via our bodies.

As Patricia Shehan (1987) stated: "Music the aural art is also music in the kinaesthetic art" (p.25). Most children are able to explore through movement, and experience what they could not convey with words (Trevlas, Matsouka, & Zachopoulou, 2003). Movement activities allow children to exercise and develop their creative and inventive abilities, as well as their spirit of adventure (Capel, as cited in Trevlas, 2003). As Dalcroze (as cited in Swanwick, 1988) stated, our musical acuity is dependent on our body's sense of movement and involvement.

Psychomotor development is viewed as an important criterion for young children, in which it can strengthen both cognitive and affective competencies (Gallahue, 1976). Jean Piaget, the developmental psychologist emphasized the importance of movement as the method for children to learn about themselves, and explore the world around them (Gallahue, 1976).

1.2 Statement of Problem

Movement plays an important role in music learning, and attention needs to be paid to the use of different types of movement for young children. Movement in music learning has been recommended by many scholars (Large, 2000; Alexander, 2006; Repp, 2006). Many well-known methods such as Dalcroze, Orff, and Kindermusik largely involve bodily movement in music learning. Movement involvement is important in music learning, therefore more attention needs to be focused on the link between gender and music in relation to two categories of body movement, namely locomotor and non-locomotor movement. Sims (1985) did a research on children's natural movement response to music among children aged three to five. She concluded that there is a

significant relationship between age and movement responses, and between gender and movement responses. Meanwhile, Alexander (2006) did a similar study on younger children aged one to three with different tempo. He found that children at different ages have different preferred movement (either locomotor movement, axial movement or small movement) at different tempo. Both Sims (1985) and Alexander (2006) emphasized the importance of movement response to music, but there was no specific movement type listed out in their research. This research aims to find out the specific locomotor and non-locomotor movements that help children in synchronising movements to music.

1.3 Purpose of Study

1. To investigate the relationship between locomotor movement and non-locomotor movement in response to music.
2. To examine the relationship between gender and locomotor movement in response to music.
3. To examine the relationship between gender and non-locomotor movement in response to music.

1.4 Research Questions

The research questions focused on the effectiveness of locomotor and non-locomotor movement in synchronizing movement to music among young children.

Research Question 1: Is there a significant relationship between locomotor movement and non-locomotor movement in response to music among young children?

Sub-Research Question 1.1: Is there any significant relationship between locomotor movement and synchronisation to music among young children?

Sub-Research Question 1.2: Is there any significant relationship between non-locomotor movement and synchronisation to music among young children?

Research Question 2: What is the relationship between locomotor movement and gender among young children?

Research Question 3: What is the relationship between non-locomotor movement and gender among young children?

1.5 Significance of Study

The findings of this study will reveal the benefits of movement involvement in music learning. Scholars concluded that young children express their thoughts and emotions through body movement (Anderson, 1925). Gallahue (1976) also believed that children explore the world through movement. Many well-known music educators including Zoltan Kodaly, Carl Orff and Emile Jaques-Dalcroze pioneered the use of movement in teaching rhythm, improvisation, dynamics and other musical concepts. Movement involvement in music learning was significant, but there was no previous research that compares the differences between locomotor and non-locomotor movement. Therefore, this research aims to find out if there are any differences or preferred movements that synchronised musical pulse among children aged five and six years old. By conducting this study, educators and the relevant parties concerned will have useful information on the use of body movements in music teaching and learning.

1.6 Delimitation of Study

This study is limited to children aged five to six, from kindergartens and music centres in the Klang Valley.

1.7 Definition of Terms

1.7.1 Synchronization

The synchronization of movement with musical pulse was described as sensorimotor synchronisation (SMS) by Repp (2006), in which it was described as the coordination of

rhythmic sense with rhythmic movement. Wiens (2015) stated that beat synchronisation refers to the ability to move in time to a steady beat. She claimed that synchronisation can be done much more easily via auditory rather than visual perception.

Children experience an increase in physical development by the age of five, which leads to an improvement of coordination (Pound & Harrison, 2002). This enables children to make use of body sounds by clapping, clicking or stamping. Pound and Harrison (2002) stated that these physical activities will help to enhance a steady sense of rhythm.

In this study, synchronization of movement refers to the movement that was repeated for at least twice in a musical phrase. Movements that are synchronized with musical pulse but only happen once, are consider as random movement and will not be included in this study.

1.7.2 Musical rhythm

The origin of all rhythm is the musical pulse (Wiens, 2015). It is the 'timekeeper' that adjusts various activities (Krumhansl, 2000). Rhythm involves pulse, beat, tempo and meter. Musical pulse and musical beats are often considered to be the same (Wiens, 2015). It is the fundamental concept in music and dance. It is an ongoing, repetitive and steady pulse that makes you feel like dancing, clapping, or nodding your head. A sense of beat is the principal of any rhythmic ability (Radocy & Boyle, as cited in Rohwer, 1998). Cooper and Meyer (1963), when explaining the sense of beat, described that "once established, tends to be continued in the mind and musculature of the listener" (p.3). Tempo is the speed of the beat, and that speed can be varied in different selections of music. Meter refers to the organization of rhythm in music (Wiens, 2015). Repp (2006) also believed that whether in musical or dance performances, movement and music are largely connected in which they require accurate coordination of sound and movements.

In this study, the movement responses with musical rhythm refers to the movement that was synchronized to pulse, beat, tempo and meter in music. This study focused on movement responses that is ongoing and repetitive with steady musical rhythm and pulse. The synchronization of movement in this study were closely related with the musical rhythm. The selection of musical pieces in this study were pieces with clear, straight forward and steady musical rhythm, instead of syncopated rhythm. This is to ensure the musical rhythm is not too difficult for young children to manage.

1.7.3 Movement categories

Fundamental movement skills are the outgrowth of the fundamental movement phase for children between the age of two to seven (Gallahue, 2012). This is the time where children actively participate in exploring and experimenting with movement with their bodies (Gallahue, 2012). Fundamental movement involves three categories of movement, which are locomotion, stability and manipulation (Doherty & Brennam, 2008; Gallahue, 2012; Eka Fitri Novita Sari). Stability is also referred to as non-locomotor movement (Doherty & Brennan, 2008).

This study only focused on children aged five and six, as their fundamental movement skills are ready and well developed. There were different kind of movement responses, only locomotor and non-locomotor movement are being focused in this research.

1.7.3.1 Locomotor movement

Locomotor movement is movement involving travelling through space from one point to another, such as walking, running, jumping, hopping, and skipping. It was described by Gallahue (1976, p.4) as a "projection of the body into external space by altering its location in either a vertical or horizontal plane".

In this study, children who were involved in locomotor movement were guided by the researcher in walking, running, jumping, hopping and skipping with music. Pre- and post-test design were used to find out if there is any improvement of movement responses with music among young children.

1.7.3.2 Non-locomotor movement

Non-locomotor movement refers to movements that do not involve traveling through space. It includes axial movement such as clapping, punching (strike), swinging, and turning.

In this study, children in the non-locomotor group were guided by the researcher to responses to music with clapping, punching, swinging and turning. Children were not restricted from moving around, but were encouraged to follow researcher by imitating the non-locomotor movement being demonstrated.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter is the literature review of music and movement with young children by various researchers. Blatt and Cunningham (1975) stated that very young children learn through movement and their senses. In the research of Blatt and Cunningham (1975) involving movement to poems, they found that movement could enlighten the meaning of words and sentences, bring rhythm to the poem, and lead to a better understanding and interest from young children (Blatt & Cunningham, 1975). Baruch confirmed the importance of movement by stating that children's I.Q. rose significantly after training in the expression and awareness of body movement and feelings (as cited in Brody, 1953).

2.2 Response to Music

There are four different kinds of reaction patterns in response to music which are: the sensory, emotional, associative-imaginal and objective responses (Broklehurst, 1971). Sensory response refers to the psychological and physiological connection to music. Emotional response is the reaction from projecting one's feelings and particular human characteristics into the music. Associative-imaginal is the "tendency for auditory and visual imagery to be aroused" (p. 46). Objective response refers to the listener's intellectual description of his or her response (Broklehurst, 1971). Movement responses are the "most basic, earliest and most lasting reaction to music" (Van de Wall, 1936, p.57). Children are able to give expressive responses through movement (Broklehurst, 1971; Dainow, 1977), and natural reactions in sync with the beat of the music (Wiens, 2015).

In this study, response to music refers to the synchronisation of bodily movement to musical rhythm. According to Large (2000), people perceive a beat in the rhythm when listening to a piece of music, and this perception allows the coordination with the music.

2.3 Movement

According to Burton and Miller (1998), movement is not motor but a goal-directed and observable movement pattern. A motor ability are internal motor processes and not directly observable. Motor ability are deduced from movement performance. In the other hand, movement emphasises the observable act of moving. (Burton & Miller, 1998). Bruton & Miller (1998) classified movement skills into four categories which are early movement milestones, fundamental movement skills, specialized movement skills, and functional movement skills. Scholars also claimed that movement is an essential part in one's musical experiences. By involving movement, children are able to communicate their understanding of musical ideas (Malan, 2015; Wiggins, 2008). Student should be given more opportunities and experiences in movement to internalise, experience the duration, the long and short rhythm in song in order to understand the rhythm in music (Wiggins, 2008). Wiggins (2008) believed that through physical interactions with music, students will be able to understand how music works, even if they were not able to articulate verbally about their understanding.

2.4 Music and Movement

Movement involvement in music learning was believed to be effective for young children. As Gruber stated in 1986 (as cited in Trevlas, Matsouka, & Zachopoulou, 2003), a preschool-aged child's overall development, in the way of action, expression, communication and learning is determined by movement involvement. Infants could perceive meter from movement, from as early as seven months old. Researchers found that infants could bounce to a duple or triple time meter while listening to a rhythm (Sievers, Polansky, Casey & Wheatley, 2013). Wang (2008) claimed that involving locomotion movement, such as walking, galloping and stamping in the music class, helped students gain a better understanding of steady beats, and balance in music. He also

stated that constant music training in rhythmic activities with locomotion would help students in learning different rhythms and meter efficiently.

Musical concepts such as pitch, rhythm, loudness, accent, volume and quality, are the products of body-movement-feeling-awareness (Brody, 1953). Children tend to move their body unconsciously when they listen to, or imagine the sounds made by others; they move as if they were making those sounds (Jacobson, 1932). Children have the tendency to move their smaller muscles when they feel the tone is a high tone, and if they think the pitch is low, they would tend to contract their larger muscles (Brody, 1953).

Seitz (2005) also stated the importance of movement with music in jazz performance. In jazz improvisation, he claimed that bodily movement plays an important role for both the musician and the audience. David Sudnow (as cited in Seitz) found that jazz musicians improve and develop their skill by initially involving and controlling the left-hand-chordal harmony in a rhythmic sequence. Jazz musicians continue to anticipate improvisations by coordinating melody with bodily rhythm; Sudnow (1978, as cited in Seitz, 2005) described this as involving the time with the entire body, including torso, limbs and fingers. The musician's interpretation through bodily movement is able to impress upon the audience.

Brody (1953) made a meaningful statement in her article; she believed the varied pitches made by children in their early life are not via imitation. Rather, children's ability to make sounds in varying pitches is a sign of their natural ability, rather than by imitation or training.

The child does not learn to make these pitches through imitation. He can only imitate that which he can already do. He makes sounds, not because he heard someone else make

them, but because sound is already in his tissues and when his body functions and moves, it makes sounds. (Brody, 1953)

2.5 Historical Study on Rhythm and Movement

The emphasis on music learning through movement began early in the 20th century. Many well-known music educators including Zoltan Kodaly, Carl Orff and Emile Jaques-Dalcroze pioneered the use of movement in teaching rhythm, improvisation, dynamics and other musical concepts.

2.5.1 Kodaly Method

The Kodaly method was founded by Zoltan Kodaly. Kodaly felt that movement is closely related to music learning. He claimed that movements should be unstructured but remain closely related to the lyrics and rhythm of the music (Deiboldt, 2010). Kodaly found that children often combine varieties of movement in response to different tempi and musical styles which then developed into an awareness of body rhythm (Woods, 1987, as cited in Deiboldt, 2010). Kodaly studied the Dalcroze method in Switzerland and derived the use of movement in his music teaching (Richard, 1966). He encouraged children to 'move to music' through their voice and bodies; where their whole body is used in maintaining rhythm while singing (Richard, 1966). On the other hand, Dalcroze emphasized more on the use of the piano and movement to music that is heard (Richard, 1966).

2.5.2 Orff Schulwerk

The Orff method (or Orff Schulwerk) is a method of teaching music and movement developed by German composer and music educator Carl Orff (1895-1982). Carl Orff claimed that movement was the key to success in rhythmic learning in music, as he stated: "Elemental music is never music alone but forms a unity with movement, dance and speech" (as cited in Deiboldt, 2010). The combination of speech, rhythm, movement,

singing and playing were often found in Orff's classroom (Deiboldt, 2010). In fact, Orff encouraged a play-like atmosphere for music teaching where he often combined movement and music to emphasize rhythmic movement and improvisation (O'Brien, Collins, & Credo, 2011). Music-making was the fundamental priority in Orff's method, and he encouraged children to create and participate in music by using four basic body movements, namely stomping, clapping, snapping fingers and patching (a light tapping on the thigh), even before any musical notation was introduced (Woods, 1987; Saliba, 1991, as cited in Deiboldt, 2010).

2.5.3 Dalcroze

Emile Jaques-Dalcroze was the founder of the Dalcroze method. He developed Dalcroze Eurhythmics, an approach that focused on music learning through body movement. Jaques-Dalcroze realized that a majority of his students had poor musical ability, even at the elementary level. Dalcroze (1930) thought that the "knowledge of sound" and the "sense of rhythm" would not improve very much with only theoretical explanation, without the 'experience'. "Dalcroze encouraged pupil's personal body-rhythm... sound rhythms had to be stepped or obtained by gestures..." (Jaques-Dalcroze & Rothwell, 1930). Jaques-Dalcroze believed that all the musical elements such as melody, melodic contour, rhythm, phrasing, cadence points, accents, micro-variation in timing and dynamics, and harmony, are drawn from bodily processes (Seitz, 2005); without the involvement of bodily movement in learning, the thoughts and emotions would not be deeply rooted. As a result, most people fail to coordinate the ideas and emotions together (Jaques-Dalcroze & Rothwell, 1930). Dalcroze's approach was described by Seitz (2005) as the method that most clearly demonstrated the body's articulation in relation to harmonic, dynamic, and static rhythm, in music pedagogy and musical expression. Jaques-Dalcroze (1967, as cited in Seitz, 2005) stated that both music and movement need preparation (anacrusis), action (crusis), and reaction (meatacrusis).

The Dalcroze approach is well known for mainly using body movements in music education. Lessons often involved body movement in introducing rhythm, rhythmic solfege (the combination of rhythmic and solfege or voice), harmony and improvisation (Seitz, 2005), which is referred to as rhythmic gymnastics, rhythmic solfege, and rhythmic improvisation by Jaques-Dalcroze (1930). Dalcroze stated that imagination can be strengthened through rhythmic gymnastics, and enables one to transform the mind for greater self-possession, a higher level of imagination, and stronger mental concentration.

Jaques-Dalcroze realized that many musicians suffer from arrhythmic, which means incorrectly using their bodily movement in relation to rhythm. Eurhythmics was created as a solution against arrhythmic. He discovered that many people were 'blind' towards rhythm, for example, who is able to identify the rhythm of a musical piece, had difficulty in expressing the rhythm through conducting, or failed to sight-read a piece of music though being aware of the following notes (Jaques-Dalcroze, 1933). Eurhythmics, as described by Jaques-Dalcroze, comes from within, presented through physical and intellectual means (Jacques-Dalcroze & Rowell, 1930). In olden times, people naturally moved rhythmically as they sang, when they got tired from work. It was a part of daily life, and people did it regularly. This natural rhythmic sense is now 'paralyzed' in many of us in this modern life, where most of human labour has been taken over by machinery. It is possible and necessary to restore these natural rhythms, and it would restore our ability for coordinated spontaneous movement (Jaques-Dalcroze, 1930)

2.6 Psychomotor Development (Motor Development)

Psychomotor development refers to learning to move with control, and manage through space (Gallahue, 1976). Children aged five to seven are in the primary-grade (Gallahue, 1976). Children at this age have better-developed large muscle groups than small muscles in the body, referred to as the cephalocaudal (head to toe) and

proximodistal (centre to periphery) development (Gallahue, 1976). Fundamental movement and locomotor abilities are often well-defined, and children can gallop, climb, jump and skip in a mature pattern (Gallahue, 1976). Sims (1985) found that children's response to rhythmic movement increases with age in her study. She stated that a 5-year-old child can move much more rhythmically than a 3- or 4-year-old, and their responses are very different from each other. Younger children tend to respond quicker to initial changes in the music than older children, but slowly unaware of the next few changes when listening to a music in different musical content. This is believed to be due to younger children having a shorter attention span. Jean Piaget defined the preschool age (aged two to five) as the 'preoperational' stage, which is significant and important for cognitive development (as cited in Gallahue, 1976). At this stage, children are actively developing their cognitive abilities in many ways.

There are a few principles in physical development that are recognized by scholars, namely the neurological development, rate of growth (or rate of development), differentiation and integration, phylogenetic and ontogenetic behaviour, (Nucci, 2009; Gallahue, 1976), and maturation and experience (Gallahue, 1976).

The neurological development and the physical growth of infants is based on two principles, which are cephalocaudal and proximodistal. Cephalocaudal development is the physical development and the progress and increase of body control from the head to the lower part of the body (Gallahue, 1976). Gallahue took the development of the foetus as an example for the cephalocaudal development sequence. During the foetus' formation, development begins from the head, then to the arms before moving to the legs. It is often noted that preschool children face difficulty or awkwardness when moving their lower extremities, and this is believed to be caused by their incomplete cephalocaudal development. Proximodistal is the physical development from the centre of the body to

its periphery parts (Gallahue, 1976; Nucci, 2009). In other words, the gross motor skills come before the fine motor skills (Nucci, 2009). For example, children start learning to control the muscles of their wrists, hands and fingers only after they managed to control the muscles of their torso and shoulders (Gallahue, 1976).

Besides that, every child has a regular and universal rate of growth (rate of development). The majority of children will grow according to a standard timetable (Gallahue, 1976; Maccoby, 1984). Even when children have a slower growth rate caused by certain illnesses, they tend to regain the similar growth rate as their peers when they recover.

Differentiation is the gradual development from the gross movement pattern to the more functional movement in children as they mature. Integration refers to the coordination between various muscle and sensory systems.

Phylogenetic behaviours are defined as the fundamental movements of young children that are intuitive. It includes rudimentary skills such as grasping and releasing objects, and running, walking or jumping (Gallahue, 1976). On the other hand, ontogenetic behaviours do not come naturally, but rely mainly on the environment opportunities. Skills such as bicycling and swimming are examples of ontogenetic activities that require practice and experience for improvement.

Developmental studies have found the close relationship between bodily movement with speech and musical sounds (Papousek, as cited in Seitz, 2005). One-year-old infants often sing rhythmic sequences, mostly accompanied by rhythmic bodily movement. Their limb and trump movements are closely similar and related to their speech pattern (Seitz, 2005). Children can feel, and are able to differentiate pitch, rhythm and phrases through movement; this is often done unconsciously (Brody, 1953).

2.7 Movement Types

Motor development is subdivided into two aspects by Gallahue (1976), namely movement abilities and physical abilities. Movement abilities refer to the development and the process of a wide variety of movement. Gallahue (1976) had it classified into *Stability*, *Locomotion*, and *Gross motor manipulation*. Stability is the developing patterns of movement that allow children's bodies to maintain balance and support, for the exploration through space. It involves bending, stretching, tip-up, and rolling movement. Locomotion, which Sim (1985) described as locomotor movement, involves the projection of the body into external space by changing its location. Such movements involve moving from one point to another, such as skipping, running, jumping and sliding (Sim, 1985). Gallahue (1976) believed that through locomotor movement, children are able to explore the world around them. The gross-motor manipulation involves moving an object such as throwing, striking and pushing a toy, which allows children to feel the force from objects. According to Gallahue (1976), children develop gross-motor skills from the age of two to seven.

Physical abilities can be classified into physical fitness and motor fitness. Physical fitness refers to the development of health, and increase in bodily functions such as muscular strength, muscular endurance and flexibility. Motor fitness refers to the body's performance in terms of technique and skill. It involves abilities such as speed, power, agility, balance and coordination.

Sims (1985) categorized movement responses under four categories in her study, which are locomotor movement, axial movement, small movement and non-movement responses. She found that 5-year-old children often respond to music through locomotor movement compared to 3- and 4-year-old children, whereas 4-year-old respond more via

axial movement (non-locomotor). In this research, only two types of movements are used, which are locomotor movement and non-locomotor movement.

2.7.1 Locomotor movement

Locomotor movement is a movement that involves traveling through space. It is moving one's body from one point to another point, such as walking, running, skipping, jumping, and leaping. It was described by Gallahue (1976, p.4) as a "projection of the body into external space by altering its location in either a vertical or horizontal plane". In Mahan (2015)'s study, she proved that locomotor was able to help student in decision making, analytical listening and creating.

2.7.2 Non-locomotor movement

Non-locomotor movement refers to movement that does not involve traveling through space. It includes axial movement such as clapping, punching (strike), swinging, and turning. A non-locomotor movement was much preferred by 4-year-old child in Sims (1985)'s study. While in Alexander (2002)'s research, 1-year-old and 3-year-old preferred non-locomotor movement when the music was played. Mahan (2015) stated the role of non-locomotor in problem solving, which involved decision making, analytical listening and creating. Both locomotor and non-locomotor in Mahan (2015)'s study shown similar function. Therefore, further study will be needed to investigate if there are any significant differences between locomotor and non-locomotor movement.

2.8 Cognitive Behaviour and Motor Development

Cognitive behaviour and motor development are closely related, as both physical and mental training are needed for young children (Gallahue, 1976). Throughout their growing life, young children's bodies develop awareness towards spatial, directional and

temporal properties (Gallahue, 1976). Anderson (1925) agreed with the statement by claiming that one can express themselves in the most natural ways when the body is under physical and mental control. However, Anderson also claimed that this must include the importance of expression or emotion in the theory.

Inskip and Brody (as cited in Brody, 1953) found that awareness of body movement can help express word meanings. Jacobson (1932) stated that thinking is always accompanied and involved with body movements. Ketcham (1951) found that improvement in body coordination and body awareness occurs together with the improvement in reading. Lowenfeld (1947, as cited in Brody, 1953) also found that body awareness is interrelated with children's drawings. Meader and Muyskens (as cited in Brody, 1953) stated that body-movement-feelings-awareness and speech and language are interdependent.

The involvement of movement in music allows children to enhance memorization. Highben and Palmer (2004) found that both auditory and physical (motor) skills are important in allowing pianists to memorize an unfamiliar musical piece, although there were no significant differences between auditory-only or physical-only practice. This is a clear sign that both cognitive behaviour and motor development are closely related. This is supported by Boykin and Cunningham (2001) where they found that African-American children study and understand a story better when they involve a lot of highly expressive movement expression (such as dancing, jumping, and running) compared to little movement opportunity (such as walking and standing). The Dalcroze method, which emphasizes movement involvement in music learning, supports this statement. Jacques-Dalcroze believes that physical movement forms the basis of musical consciousness, and he refers to this as tonal and rhythmic imagery (Seitz, 2005).

> The sensations afforded by the natural rhythms of our bodies strengthen our instinct for rhythm and create rhythmic consciousness. It is through this instinct and this consciousness, blended with the aesthetic sense, that we experience complete artistic emotions. (Jaques-Dalcroze, 1930, as cited in Seitz, 2005, p.424)

2.9 Synchronization to Steady Pulse

Plenty of research were done to examine, and help students in improving synchronization to a steady pulse. According to Rohwer (1998), students who received movement instruction in class were more synchronized and able to perform to a steady beat.

General music education methods such as Dalcroze, Kodaly and Orff encouraged music learning with bodily movement, though some researchers claimed that young children face difficulty in synchronizing movement to music (Gordon &Martin, 1993/94; Grieshaber, 1987; Rainbow, 1981; Rainbow 1977). They believed the ability to synchronize to pulse steadily increased with age (Ellis, 1992, as cited in Rohwer, 1998; Schleuter & Schleuter, 1985).

2.10 Review on Synchronising Musical Pulse

There is no doubt steady pulse in music learning and music performance is important. Deiboldt (2010) applied Dalcroze's Eurhythmics on beginner string students. She invited students to clap with metronome, walk with the pulse, playing the rhythm on percussion, and finally play it out with their string instruments. She found out that students who choose to use movement improved significantly in rhythmic task, as compared to students who preferred not to use movement. Deiboldt (2010) mentioned the importance of movement involvement in music. The use of kinaesthetic activity helps students to combine what they hear, see and feel to internalise knowledge and new concepts. In her research, she observed six sixth grade students (11-year-old) who were having some

difficulties in maintaining a steady pulse in music playing. Students who incorporated movement improved the rhythm in their playing during the post-test. Deiboldt provided a clear observation of student's movement by listing out the types of movement (clapping and walking). In Deibolt's research, there was no comparison between walking and clapping, and it would be better to include more participants in future study.

2.11 Rhythm and Movement

Rhythm is fundamental to both interpretative and creative arts (Anderson, 1925). Anderson (1925) believed that children's musical ability and arts appreciation may be enhanced by the development and improvement in rhythm during the early stages. Jaques-Dalcroze (1933) highlighted the importance of rhythm and eurhythmics, and he claimed that teachers of any instruments should start with a full study of rhythmic. Rhythm is about movement, and it requires space and time. Jaques-Dalcroze believed that physical experience can form musical consciousness that leads to the clarity of musical perception, and the improvement of movements in time will improve the consciousness of musical rhythm (Jaques-Dalcroze, as cited in Seitz, 2005).

Rhythm plays an important role in every expression of human nature. The importance of rhythm and movement, and the rhythmic education of body and mind were recognized by the ancient Greeks (Jaques-Dalcroze, 1930). Rhythmic education was believed to influence man's inner personality; Plato described rhythm as the soul of the entire human body, and showed the harmony of one's personality (as cited in Jaques-Dalcroze, 1930).

"Body and mind are interrelated and interdependent" said Brody (1953), and everything that is rhythmic involves the complete union of body and mind (Jaques-Dalcroze, 1930). According to Laudin (1967, as cited in Sims, 1985), the body has a neuromuscular system that can be trained to perceive, and react to rhythmic stimuli, and this training may be achieved through movement experience (Sims, 1985). Meanwhile,

Stecher and McElheny (as cited in Sims, 1985) stated that accuracy of rhythm can be enhanced and developed though bodily movement experience. At the same time, Todd (1992, as cited in Seitz, 2005) claimed that perception and performance of tempo is related to physical dynamics and mind.

The most important goal of using movement in music education, or music in movement education, is believed to be the development of rhythmic concepts and skills (Sims, 1985). In other words, by applying movement in music learning, one can greatly enhance their rhythmic sense. Jaques-Dalcroze stated that body sensations can enrich the brain, and we need rhythm to coordinate the activities. Rhythm enables us to control and be expressive, an important prerequisite of any art. The training of natural rhythms results in beauty formed from the coordination of the body and limbs. As a result, a harmonious bodily movement infuses a human and spiritual feel to the music (Jaques-Dalcroze, 1930). Rhythm and movement are closely related; in fact, rhythm without movement (or movement without rhythm) is very rare (Shehan, 1987). As Shehan cited, Willi Apel defined rhythm as "the whole feeling of movement in music" and "the movement involving with time and space".

Most scholars found that physical performance and rhythmic perception are closely related (Gallahue, 1976; Anderson, 1925; Highben & Palmer ,2004). Even Kartasidou, Varsamis & Sampsonidou (2012) found the same results in special-needs children. Rhythm is described as the most outstanding component of music, which is linked with motor behaviour, and demonstrates the responsiveness of the sensory motor system to auditory stimuli (Syns, van Noorden, Moelants, &Leman, 2007).

Rhythm plays an important role in our daily life. In fact, one cannot separate rhythm from daily routine. Rhythmic movement involves synchronizing sequenced patterns of movement. We are using rhythmic movement with or without realization, such as when

breathing, walking, or speaking. These activities involve rhythm. Even a young infant would start kicking and waving hands in rhythm. According to Gallahue (1976), rhythm is the fundamental element of all coordinated movement, and may be combined to enhance each other. In other words, rhythmic abilities may be developed through movement. Doll and Nelson (1965, as cited in Sims, 1985) also defined rhythmic activities as the "repeated actions of the human body in time and space", and Sims (1956) elaborated it as a series of repeated movements that is synchronized to a steady beat.

Gallahue (1976) stated that rhythmic movement should start at a young age, and be a part of children's daily life. Cooper and Glassow (1972, as cited in Gallahue, 1976) found that beginners athletes learned professional athletes' movements better and quicker by applying the rhythm transcribed by Cooper and Glassow. These rhythms were transcribed from the sounds of movement patterns of the professional athletes into musical notation, and played on a drum during lessons. Cooper and Andrews (as cited in Gallahue, 1976) concluded that "it appears that beginning performers can profit by listening to and emulating certain elements of the rhythmic pattern of the good performers."

"There is no rhythm which is not manifested physically" said Jaques-Dalcroze (1930, p.360). Dalcroze (1930) believed that no rhythm can take place sufficiently without involving bodily movement, and claimed that rhythmic involvement requires coordination between the body and the mind. Musicians coordinate rhythm with their breathing and bodily movement to express themselves.

2.12 Assessment and quantification of synchronising movement to musical pulse

Several studies have been done by scholars in synchronising movement to musical pulse. Sims (1985) observed the natural movement responses among children aged three to five. In her research, a very clear comparison of movement responses between age and gender was provided. Twenty-two participants were brought into a classroom

individually and were instructed to move or dance around when the music started playing. This observation was based on four movement categories, which were locomotor, axial, small motor, and no movement. Besides collecting movements that were synchronised to music, Sims also collected the sequence of movements in every 3-seconds. According to Sims, this sequence of movement was not required to be synchronised with musical beat. Sims believed that most young children do not follow the beat that surrounds them but are capable of setting one beat themselves and maintaining it for a while (Rainbow, 1981; Stecher & McElheny, 1972). Sims found that older children (5-year-old) responded the most with locomotor movement, as compared to 4 and 3-year-old. On the other hand, 4-year-old responded mostly with axial and small movement, as compared to 5 and 3-year-old. The 3-year-old showed the highest response with 'no movement'. This shows the influences of age, experience and the degree of body control in synchronising movements to musical pulse. In her research, she also found that 3-year-old demonstrated the fastest reaction to the first change of music. This was due to children at 3-year-old were more on-task in listening. Besides ages, Sims also compared her data according to gender. She found that boys responded mostly in locomotor, small movement and no movement, as compared to girls. Meanwhile, girls showed an outstanding response in axial movement. Sims's study provided clear observation in movement response to music. She compared the responses according to age and gender; collected the sequence of movement; and observed the awareness of change in music. She concluded that age level and motor ability were significant factors in synchronising movement to music. However, the number of respondents in her study was rather small with only twenty-two children ranging from the age of three to five. Furthermore, the list of movement type was not provided.

Alexander (2006) did a similar research with younger children aged 22 to 36 months (1-year-old, 2-year-old and 3-year-old), including fast and slow music. His main purpose

of this study was to investigate the effect of tempo on movement responses. Seventeen children participated in the two weeks' observation. All participants were found to move most of the time when the music was turned on. In overall movement, the 2-year-old exhibited the most movement responses, followed by the 3-year-old and the 1-year-old. If we only consider the oldest (3-year-old) and the youngest (1-year-old), the result is somehow similar to Sims' (1985) study whereby the oldest group of participants (5-years-old) moved the most while the youngest group of participants (3-year-old) moved the least. Alexander believed the outstanding movement responses from the 2-year-old was due to the activity participated during the observation period, whereas the older children may have been occupied with their activity and were not paying attention to the music. The 3-year-old and 1-year-old were participating in painting and drawing, while 2-year-old were mostly participating in a free play moment during the observation. Besides the total movement responses, the type of movement responses was collected in his study. The 2-year-old group showed more locomotor and axial movement than the oldest and youngest age group. Meanwhile, the 3-year-old and 1-year-old age groups responded more with axial movements and small movements. Alexander claimed that this may be due to the activity that children were participating. For example, painting involves more axial and small movement. Therefore, both 3-year-old and 1-year-old exhibited more axial and small movements than locomotor movements. Besides, Alexander's study suggested a relationship between music tempo and age. The middle and youngest groups moved more during the slow tempo, while the oldest groups moved the most during the fast selections. Peer imitation was another interesting fact found in his research, especially in the youngest and middle groups. Children tends to imitate the first child who initiate a new movement within a short period of time.

To summarise, this research provided the relations between movement responses and age differences; music tempo and movement responses; and peer imitation in movement

responses. The number of participants in Alexander's research was rather small, with only seventeen children involved. The observation for three age groups could be carried out in the same activities. For example, children during free play moment with music could be observed in order to identify their natural movement behaviour. Besides, this research did not focus on synchronisation and there was no movement listed in the research. Specific movement type would provide a clearer guide for teachers to design their lesson accordingly. Alexander suggested guidelines a modelling of movements from teacher shall be included in the future study. Through modelling, children were able to discover new ways of moving their bodies and adding the movements to their repertoire of responses to music (Alexander, 2006).

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter discusses about the methodology used in the study, which includes how the data was collected and which method was selected. It covers the areas of research approach, sampling, data collection, methodology, and measurement.

The purpose of this study was to investigate the aspects of locomotor and non-locomotor movement responses to music of children age five and six years old. The movement responses might function as a way that helps children to synchronize movement with music in future music lessons. In order to understand the extend of young children respond to music, it is important to know the input and the output of children's movement response.

3.2 Research Approach

This study combines two types of methodological approach, which are the quantitative and the qualitative research.

Quantitative research was described as 'empiricism' by Leach (1991), while Duffy (1985) described it as 'positivism'. Cormack (1991) claimed that quantitative research derives from the scientific method used in the physical sciences. According to Burns & Grove (1987), quantitative research is an objective and formal objective process in which numerical data describes, tests, and examines cause and effect relationships.

Meanwhile, qualitative research is another research approach that differs from quantitative approach. There is no accurate intention to count or quantify the findings, but instead describes in the language employed during the research process (Leach, 1990). According to Cormack (1991), qualitative researchers investigate certain subject based on certain ideas, perspectives or intuition. A qualitative approach is used for studying the

experimental world from the perspective of the subject, not the researcher (Duffy, 1987). Benohel (1985) described qualitative research as 'Modes of systematic enquiry concerned with understanding human being and the nature of their transactions with themselves and with their surroundings'. According to Cormack (1991), a qualitative research aims to describe certain aspects of a phenomenon, with a view to interpret the subject of study. Duffy (1985) described this methodology as phenomenology, or described as humanistic and idealistic approach by Leach (1990).

This research weighted on the qualitative especially concerning factors that contributed to movements that have not been taught during the lesson. Quantitative approach was used in measuring the type of movement that was used by children. Approaches includes: literature-based study, observation, recording and data analysis.

3.3 Subjects, Population or Sampling

Sixty-one young children aged five and six from three schools in the Klang Valley participated in this study. Simple random sampling was used, and all subjects (n = 61) were randomly assigned into two groups: Group 1, the group that attended locomotor lessons; and Group 2, the group that attended non-locomotor lesson. Sims (1985) found that locomotor movements were more often used by five-year-old children compared to axial, small or non-movement. Therefore, both axial and small movements were categorized under non-locomotor movement. The groups were balanced by gender and age. The study was conducted weekly for six lessons, excluding a pre-test and post-test session, which were scheduled before and after the six weekly lessons.

Children were randomly assigned into Group One and Group Two. Children in Group One received Treatment One (attended six locomotor movement lessons) and children in Group Two received Treatment Two (attended six non-locomotor movement lessons). All lessons were conducted by the researcher. Children's movement responses from the

pre-test and the post-test were collected and analysed. Two pieces were chosen for both pre- and post- test, which were Piece A – *William Tell (Guillaume Tell)* Overture by Gioachino Rossini; and Piece B – *The Sleeping Beauty suite, Op. 66a,* by Tchaikovsky. These two pieces were chosen for the experiment in considering the different elements (time signature, image and length) and similar musical structures and characteristics (I.e., both were a symphony piece and share the similar speed and energetic characteristic).

Each child attended a total of six hours of lessons, and another two separate sessions for pre- and post-test. During each lesson, children were required to imitate the researcher's movement when the music was switched on. Next, children would rest and discuss the possible movements that could be used (Appendix D). The researcher would remind them if their movements were not synchronized. After a five to ten-minute break, children were required to move again with the music, without imitating the researcher. Six pieces that were used during the lessons were Star Wars, Can-can, Hungarian Dance, Lavender's Blue, Minuet, and The Elephant. These pieces were chosen based on their similar musical structures and characteristics with the pre- and post- test pieces (i.e., same time signature, length, and speed).

Children's movement responses were evaluated and scored from recorded videos. Only movements that were synchronized to musical pulse were considered. Movement responses that were included in this study are locomotor movement (walking, running, jumping, hopping, skipping, leaping) and non-locomotor movement (bending, stretching, lifting, twisting, swinging, swaying, striking, turning and shaking).

3.4 The Course

This study consisted of 6 lessons, excluding one pre-test and one post-test session. Each lesson was approximately 45 minutes with a few breaks in between to avoid children from becoming too tired. During the break, teacher (the researcher) gave comments and

praises to children who were able to follow the teacher's movement and synchronised well with the rhythm.

3.4.1 The lesson plan

Six lessons were prepared by the researcher, based on a regular music lesson plan in Music Wonderland (Yamaha). The plan described the whole lesson, including materials needed, activity goals, duration of the activities and the flow of the lesson.

3.5 Methodology

Each group attended a total of six hours of lessons. The objective of the lessons was to introduce and to encourage movement response to music. Hula hoops were placed in the classroom to be used by the children. They were also used as a better measurement tool to monitor children's movements and to distance them away from the camera during the study. Children in the locomotor group were instructed to move from hoop to hoop, whereas children in the non-locomotor group would move inside their own hoop.

Both Group One and Group Two were to listen to the same music and teaching instructions. The only difference was incorporating either locomotor or non-locomotor movements in the lesson. For Group One (locomotor), each child was required to stand inside the hula hoop, and when the music started, by the researcher's instruction, they were to move from hoop to hoop in response to the music. For Group Two (non-locomotor), children would either be sitting or standing still inside his or her own hula hoop but they did not move from hoop to hoop.

During the lesson, the researcher started with a short introduction about the piece before switching on the music. When the music started, children were required to imitate the researcher's movement in response to the music. There would be a short break after this activity, to prevent children from becoming too tired. During this short break, the

researcher would conduct a discussion, and encourage children to voice out their opinions on how to respond to the music. After that, the music would be switched on again, and children would do their movement without imitating the researcher.

The experiment started with a pre-test session, followed by six hours of lessons spread over six weeks, and a post-test session to gather children's movement responses.

3.6 Procedures

During the six weeks duration of the study all 61 subjects participated in the lessons weekly. Each lesson was designed to involve bodily movement with music in different time (3/4 time and 4/4 time). The movement with music was conducted by the researcher based on direct instruction (Cleland, 1994; Masston & Ashworth, 1994), in which the researcher would show children all the movements and encouraged them to copy and respond with the same movement while listening to the recorded music. Besides that, the researcher also integrated indirect instruction strategy during the lessons, whereby children were encouraged to ask questions and give suggestions during discussion sessions. Students were encouraged to voice out their opinions, try out some other movements, and evaluate the movement responses based on given musical criteria.

Treatment Group One's (n=30) lessons were designed based on locomotor movement, including walking, running, jumping, hopping and skipping movements.

Treatment Group Two's (n=31) lessons were designed based on non-locomotor movement, including clapping, punching (strikes), swinging, turning and bouncing.

3.6.1 Experimental Study

This study was designed based on the experimental method, which included post-tests, and variables:

Independent variables: Gender and the planned movement, either locomotor movement or non-locomotor movement.

Dependent variables: Movement synchronisation to music.

Treatment group One: a group of 30 participants with 6 lessons of locomotor movements introduced with music.

Treatment group Two: a group of 31 participants with 6 lessons of non-locomotor movements introduced with music.

Children from both groups were introduced to six musical pieces. These six pieces were chosen based on their similar musical structure and characteristics, such as the time signature and speed. These lessons were to introduce children the pieces in different time signature (3/4 and 4/4) and to encourage children to respond to the music through movement. Lessons were prepared to prevent children from being shy and unresponsive, and to be comfortable in the environment.

The eight recordings (included the two recordings that were used for pre and post- test) were downloaded from YouTube. All recordings were then converted into MP3 files by using online mp3 converter at http://convert2mp3.net/en/. All recordings with the YouTube author's name and the year it was published are listed below:

Materials (recording):

(A) 4/4 time

1) William Tell (earthatic, 2008)
2) Star Wars （Merhawk102, 2007）
3) Can-can by Jacques Offenbach (LukasSchuch, 2009)

4) Hungarian Dance (Facundo, 2007)

(B) 3/4 time

1) Sleeping Beauty (TheWickedNorth, 2008)
2) Lavender's Blue from Cinderella (Sarunya, 2015)
3) Minuet by J.S. Bach (xiaocurypuff, 2008)
4) The Elephant by Saint-Saëns (nagylaj, 2008)

Movements:

Locomotor:

1) Walking
2) Running
3) Jumping
4) Hopping
5) Skipping

Non-locomotor:

1) Clapping
2) Punching (strikes)
3) Swinging
4) Turning
5) Bouncing

3.7 Data Collection and Analysis

Data was collected through observation from video recordings. A Panasonic Lumix DMC-GF6 camera was used for video recording in all six lessons and pre and post-test in this study. All six lessons and one pre-test and post-test session were video-recorded

as a reference and for analyses' purposes. Basic information such as the participants' name, age and gender were collected. A Movement Response Form was devised to collect movement responses that were synchronized to music. A Movement Observation Form was devised to collect the type of movement responses. All movement responses were collected by observing videos recorded. Any movement responses that were not synchronized or not relevant to the musical pulse, were not considered in this study. All observations were done by the researcher from reviewing recorded videos.

Results from the pre-test and post-test from both groups were compared and analysed by using Statistics version 22. Collected data were analysed by two tests, which were parametric test (*t*-test), and non-parametric test (Mann-Whitney test). Skewness and kurtosis range of each data were the key of consideration for either using t-test or non-parametric test. Data skewness within the range or -2 to 2, and kurtosis within the range of -4 to 4 were considered to be normality contributed, and the t-test would be used to analyse the data. Meanwhile, if the data was not normally distributed, which skewness range and kurtosis range were found to be out of range, non-parametric (Mann-Whitney test) test would be used instead. The movement responses from both Group 1 and Group 2 were compared based on the movement type (locomotor and non-locomotor).

3.8 Measurement

The measurement in this study is to examine the synchronization of movement with music. Only movements that synchronized with music will be taken into consideration. The locomotor and non-locomotor responses that synchronized with music were collected, in order to measure the differences between locomotor and non-locomotor in synchronizing movement with music.

3.8.1 Locomotor movement

1) Walking

Walking involves alternating of weight with one foot placing in front of the other, and maintaining contact with the floor (Gallahue, 1976; Kogan, 2004). It includes walking forward, backwards, sideways, and turning (Kogan, 2004) in this study. Kogan (2004) stated that turning is a non-locomotor movement combined with walking.

2) Running

Running involves a brief period of non-contact with the floor (Gallahue, 1976). It is not always or necessarily a fast walk, rather it is a series of small leaps (Kogan, 2004). Running can be in slow- or rapid-motion.

3) Jumping

Jumping is a lift with one, or two feet taking off in the air, and landing evenly with both feet (Gallahue, 1976; Kogan, 2004). The movement involves jumping for distance, jumping for height and jumping from a height (Gallhue, 1976).

4) Hopping

Hopping is a take-off from one foot and landing on the same foot (Gallahue, 1976).

5) Skipping

A skip combines, and alternates between a step and a hop (Gallahue, 1976; Kogan,2004).

6) Leaping

Leaping is a step in the air (Kogan, 2004).

7) Crawling

Crawling is a four-body-part walk (Kogan, 2004). It involves crawling forward, backwards and turning in this study.

3.8.2 Non-locomotor movement:

1) Bending (Bending and Straightening)

Bending is a folding of two straight sides, while straightening is an alignment of the sides (Kogan, 2004).

2) Stretching (Contracting and Stretching)

Contracting is a tense rounding while stretching is an extension or expansion (Kogan, 2004). These movements can be done by the whole body, or parts of the body such as arms, legs, and fingers.

3) Twisting

A twist is a stretch of two parts in opposite directions (Kogan, 2004). It includes the twist of the arms, legs, head, torso and hands in this study.

4) Swinging

Swing is an arc-shaped movement with a release of tension at the low point of the arc. Swinging can either be a whole-body swing, or isolated by arm, leg, head, hips, and hand swing. Swinging often has a lyrical waltz-like character.

5) Strikes (Punching)

A strike is a punching motion, and is similar to a boxer's jab or karate chop (Kogan, 2004). It includes striking with the arm, leg, torso, hip and elbow.

6) Turning

A turn is a spin, or twirling rotation of the body. It includes a whole-body turning or body parts (Kogan, 2004). In this study, turning includes the turn and walk, rotating waist and rotating arms.

7) Shaking

Shaking combines wiggling, or the wriggle, vibrate and flick (Kogan, 2004). The shake can be isolated to body parts, such as shaking hands, arms, leg, or torso.

8) Falling

According to Kogan (2004), falling in dance refers to lowering of the body with control.

9) Bouncing

Bouncing is a drop-like movement (Kogan, 2004). In this study, it includes the head (nodding), shoulder and knees.

CHAPTER 4: DATA ANALYSES

4.1 Introduction

There were three main purposes in this study: (1) to investigate the relationship between locomotor movement and non-locomotor movement in response to music; (2) to examine the relationship between gender and locomotor movement in response to music; and (3) to examine the relationship between gender and non-locomotor movement in response to music. Participants for the study were children aged five and six, which were randomly divided into locomotor or non-locomotor groups. Participants were selected from two kindergartens and one music centre in the Klang Valley. A total of eight groups were formed from mentioned kindergartens and music centre. Three groups of children from Kinderland Kindergarten attended locomotor lessons; two groups from Smart Music Centre were locomotor group; one group from Smart Music Centre and two groups from Harmony Kindergarten attended non-locomotor lessons. This arrangement was made to ensure equal number of children for both locomotor and non-locomotor groups.

Table 4.1

Participants Demographics

Demographic	Variable	N	Percentage
Gender	Male	27	44.26
	Female	34	55.74
	Total	61	100
Age	Five	35	57.38
	Six	26	42.62
	Total	61	100

A total of 74 children participated in this study, however, only 61 participants' data were collected and included in the final analysis. Twelve participants' data were not collected as they were absent during the post-test sessions, and one child refused to participate. Demographic data of all participants were shown in Table 4.1. Sixty-one participants were randomly assigned into two groups; Group 1 for the locomotor treatment (N = 30) and Group 2 for the non-locomotor treatment (N = 31). Demographic data of participants from each Group 1 and Group 2 were shown in Table 4.2.

The study was conducted separately in the different schools. Experiment was carried out in the classroom in considering that children were more familiar with the environment and peers.

Table 4.2

Participant Demographics in Different Groups

Demographic	Variable	N	Percentage
Locomotor group (Group 1)			
Gender	Male	14	46.67
	Female	16	53.33
	Total	30	100
Age	Five	19	63.33
	Six	11	36.67
	Total	30	100
Non-locomotor group (Group 2)			
Gender	Male	13	41.94
	Female	18	58.06
	Total	31	100
Age	Five	16	51.61
	Six	15	48.39
	Total	31	100

Movement responses data from video recordings were collected and analysed using SPSS Statistic version 22. Visual observation was also recorded and discussed. Children's movement responses of pre- and post-test session were observed and analysed individually via recorded videos. According to Retra (2010), it is difficult to be an observer while teaching during data collection. Therefore, video camera was used to collect data in each lesson. Two forms were devised for data collection, which were Movement Response Form and Movement Observation Form. The Movement Response Form was devised to record the total number of movement responses that synchronized with musical beats, based on locomotor and non-locomotor categories. Meanwhile, Movement Observation Form was devised to record specific movement types that were used by children during the post-test, such as walking, running, jumping, bending or swinging.

Children were randomly assigned into Group One (the locomotor group) and Group Two (the non-locomotor group). Each child attended a total of six hours of lessons, and another two separate sessions for pre- and post- test. Two pieces were chosen for both pre- and post-test, which were Piece A – *William Tell (Guillaume Tell)* Overture by Gioachino Rossini; and Piece B – *The Sleeping Beauty suite, Op. 66a,* by Tchaikovsky. Children movement's responses (locomotor and non-locomotor movement) were evaluated and scored from recorded videos. Only movements that were synchronized to musical pulse were considered.

4.2 Research Question 1: Is there a significant relationship between locomotor movement and non-locomotor movement in response to music among young children?

Two pieces: Piece A (*William Tell*) and Piece B (*Sleeping Beauty*) were used in the pre-test and post-test. The collected data were first checked for normality through SPSS,

in order to select suitable test to be used for analysis. Data skewness within the range of -2 to 2, and kurtosis within the range of -4 to 4 were considered to be normally distributed, and t-test would be used in this instance. If skewness and kurtosis were found to be out of range mentioned, non-parametric (Mann-Whitney) test would be used instead.

In order to find out the relationship between locomotor and non-locomotor movement in response to music, collected data was analysed based on locomotor movement in synchronising musical pulse and non-locomotor movement in synchronising musical pulse. Locomotor group increased the synchronised locomotor movement significantly (see Figure 4.1, Figure 4.2). While non-locomotor group increased the synchronised non-locomotor movement significantly (see Figure 4.3, Figure 4.4). The detail analysis is provided in sub research question one and sub research question two.

4.2.1 Sub-Research Question 1.1: Is there any significant relationship between locomotor movement and synchronisation to music among young children?

This study aimed to find out if locomotor or non-locomotor will benefit in movement synchronisation to music among young children. This is to find out whether there is any improvement of each movement from different groups in two different movement responses. Therefore, locomotor movement and non-locomotor responses are collected from both groups and analysed accordingly, in Piece A and Piece B.

Table 4.3

Analysis of normality of locomotor movement for both groups in Piece A

Variable	Group	Skewness	Kurtosis
Pre-Locomotor	1	0.63	-0.94
	2	2.76	7.29
Post Locomotor	1	-1.01	-0.53
	2	-0.14	-1.52

Collected data were checked for normality. Table 4.3 shows that Group 1 (locomotor group) were normally distributed (skewness within -2 to 2 and kurtosis within -4 to 4), for both pre and post- test. Data of Group 2 (non-locomotor group) were normally distributed in post-test, but not in pre- test. Therefore, t-test were used for Group 1, and Mann-Whitney test were used for Group 2. Univariate analysis was used to find out whether there is a significant difference between Group 1 and 2 in locomotor movement in response to music.

In Piece A, there was a significant difference found between Group 1 and Group 2 in synchronised locomotor movement responses, at the level of 0.001 ($p<0.05$). The partial eta squared shown in SPSS was at the level of 0.16, and the *d* value (the interpretation of Cohen's *d*) of 0.88. This large effect size ($r^2 > 0.8$) means that the locomotor lessons had a substantial effect in synchronizing movement response to music.

Table 4.4

Confidential interval for locomotor movement responses from both groups in Piece A

(1) group	(2) group	Mean Difference	SE	P value	95% CI of difference	
					LB	UB
1	2	7.55*	2.25	0.001	3.05	12.05

P<0.01

Table 4.4 shows the significant differences at the level of 0.001 level in the mean difference between groups.

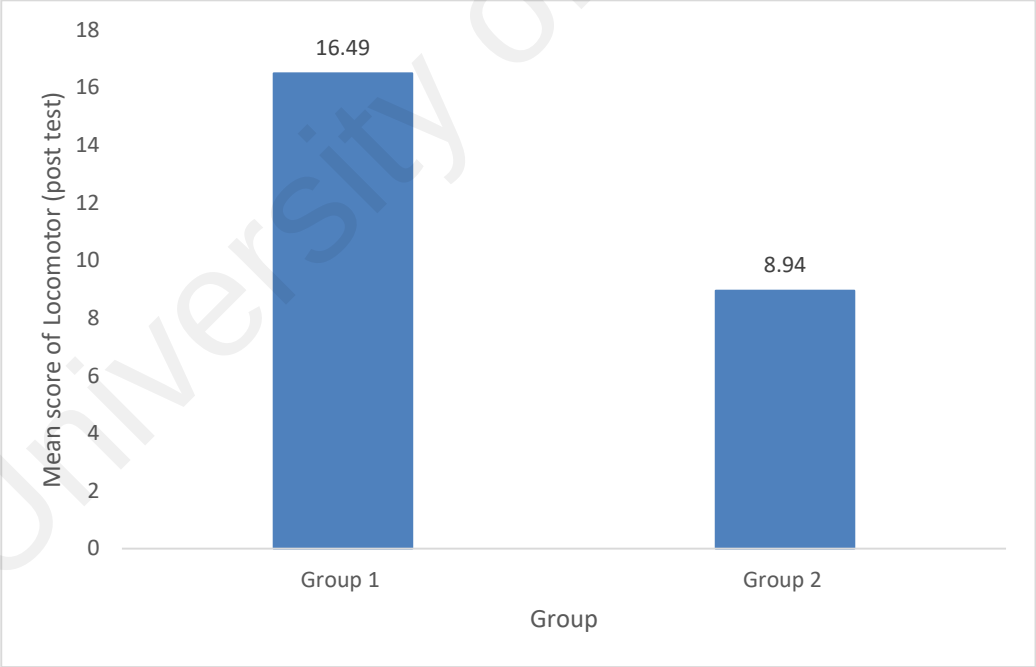

Figure 4.1 Mean score of locomotor movement from both groups in Piece A

Figure 4.1 shows the difference between two groups. The adjusted mean score difference of locomotor between two groups after removing the effect of pre-test score as

a covariate. Group 1 shows 7.55 (29.69%) higher than Group 2 in locomotor movement responses. This difference was statistically significant, as the p value at the level of 0.001 ($p<0.05$). The effect size was large, at the level of 0.88 ($r^2 > 0.8$). We can conclude that locomotor treatment has a significant impact on helping children aged five and six in synchronising locomotor movement to music pulse in Piece A.

Next, all locomotor responses from both groups in Piece B were analysed the normality in order to decide which test to use. Piece B was "Sleeping Beauty" by Tchaikovsky. This piece was in ¾ time and was also an orchestra piece.

Table 4.5

Analysis of normality for locomotor responses for both groups in Piece B

Variable	Group	Skewness	Kurtosis
Pre-Locomotor	1	0.86	-0.44
	2	1.55	1.92
Post Locomotor	1	-0.50	-0.99
	2	1.07	-0.04

Table 4.5 shows the normality result for both groups in Piece B. Data from both groups in pre and post- test were all normally distributed (skewness within -2 to 2; and kurtosis within -4 to 4). Therefore, t-test was used to analyse all the data in Piece B.

Result from t-test shows a significant differences of locomotor responses in Piece B. The *p* value was at the level of 0.000 ($p<0.01$). The partial eta squared was at the level of 0.26, have the *d* value (the interpretation of Cohen's *d*) of 1.17. This is considering as a large effect size ($r^2 > 0.8$), which the different lesson has a large influence between groups.

Table 4.6

Confidential interval for locomotor movement responses from both groups in Piece B

(1) group	(2) group	Mean Difference	SE	P value	95% CI of difference	
					LB	UB
1	2	11.07	2.48	0.00	6.11	16.03

P<0.01

Table 4.6 shown the significant differences at the level of 0.001level in the mean difference between both groups.

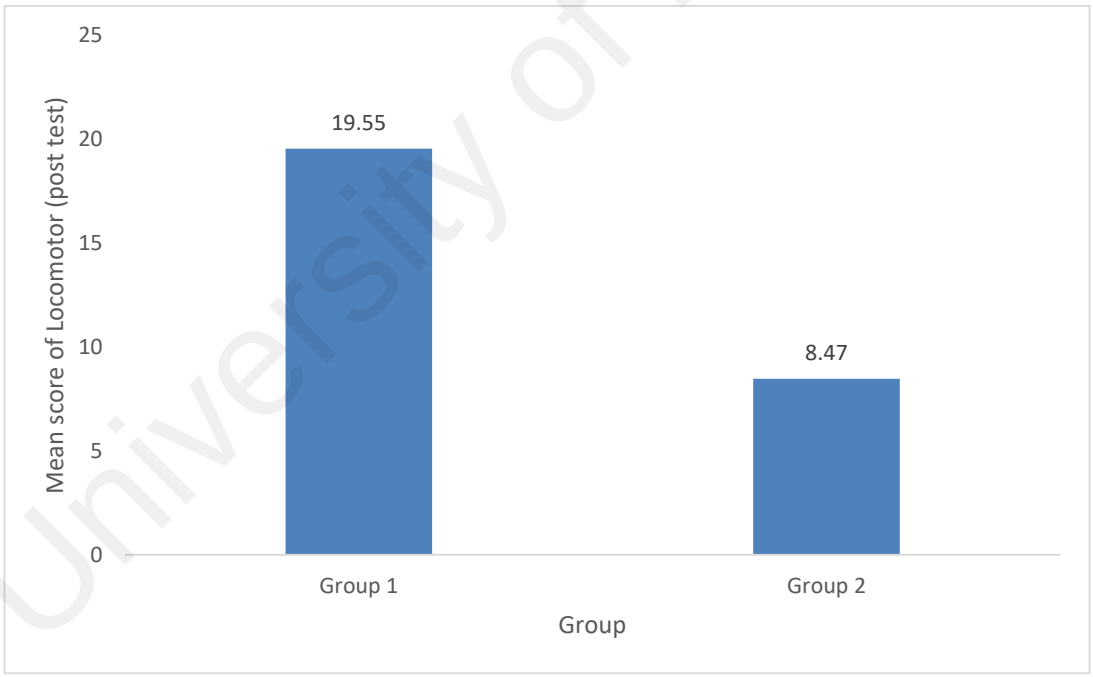

Figure 4.2 Confidential interval for locomotor movement responses from both groups in Piece B

Figure 4.2 shown the difference between two groups for adjusted mean score of locomotor after removing the effect of pre-test score as a covariate. Group 1 shows a

39.5% higher than Group 2. In other words, the Group 1 who received locomotor treatment has a significant effect and higher response in locomotor movement, as compared to Group 2. These were significantly difference, p>0.05. With the *d* value of 1.17, we can conclude that locomotor treatment has a significant impact on helping children aged five to six in synchronising locomotor to music pulse in Piece B.

Group 1 who received locomotor treatment shown higher synchronised locomotor movement to music pulse, in both Piece A and Piece B. Both pieces have different time, which was 4/4 time and ¾ time. We can conclude that locomotor treatment has a strong impact in helping children synchronised locomotor movement to music regardless the music time.

4.2.2 Sub-Research Question 1.2: Is there any significant relationship between non-locomotor movement and synchronisation to music among young children?

This study aims to find out if there are any differences between locomotor movement and non-locomotor movement in responses to music. Therefore, non-locomotor movement responses were collected from both Group 1 and Group 2, in Piece A and Piece B.

Table 4.7

Analysis of normality for both groups in Piece A

Variable	Group	Skewness	Kurtosis
Pre-Non-Locomotor	1	1.84	3.17
	2	-0.13	-0.85
Post Non-Locomotor	1	1.46	1.55
	2	0.82	0.52

Collected non-locomotor responses from both groups were first checked for normality, in order to decide either t-test or Mann- Whitney will be used. As shown in Table 4.7, all data were in the range (skewness within -2 to 2; and kurtosis within -4 to 4). Therefore, t-test were used. Univariate analysis was used to find out whether there is a significant difference between Group 1 and Group 2 in non-locomotor movement as response to music.

Result from t-test showed a significant difference of non-locomotor movement responses at the 0.01 level, which the P value was 0.00. The partial eta squared was at the level of 0.21, have the *d* value (the interpretation of Cohen's *d*) of 1.04. This *d* value shown a large effect size of synchronised non-locomotor movement responses between groups.

Table 4.8

Confidential interval for non-locomotor movement responses from both groups in Piece A

(1) group	(2) group	Mean Difference	SE	P value	95% CI of difference	
					LB	UB
1	2	-6.14	1.54	0.00	-9.22	-3.05

P<0.01

Table 4.8 shown the significant differences at the level of 0.001 level in the mean difference between both groups.

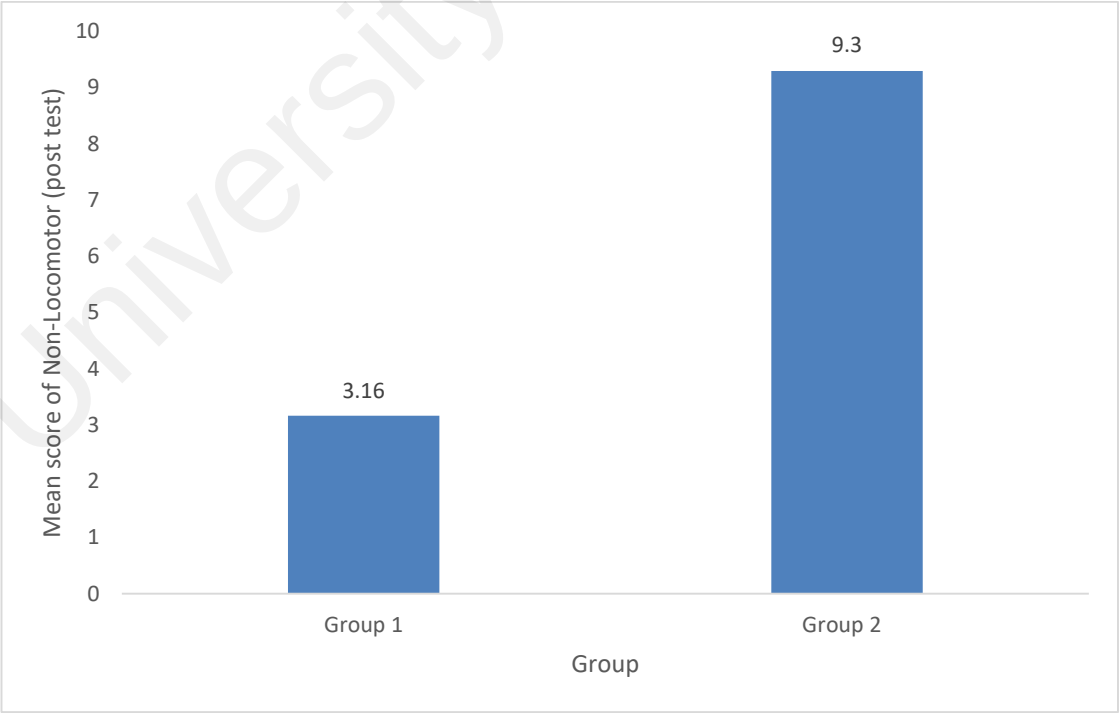

Figure 4.3 Mean score of non-locomotor movement from both groups in Piece A

Figure 4.3 shows the difference between two groups for adjusted mean score of non-locomotor after removing the effect of pre-test score as a covariate. Group 2 shows 49.28% higher non-locomotor responses than Group 1. This difference was statistically different, $p<0.05$. With the large effect size, we can conclude that non-locomotor treatment has an impact in increased the synchronised non-locomotor movement to musical pulse in Piece A.

Table 4.9

Analysis of normality for both groups in Piece B

Variable	Group	Skewness	Kurtosis
Pre-Non-Locomotor	1	1.05	0.78
	2	0.40	-0.99
Post Non-Locomotor	1	1.12	0.33
	2	0.18	-0.55

All non-locomotor responses from both groups in Piece B were checked for normality in order to decide which test to use. Data in Piece B (Table 4.9) were normally distributed (within the skewness and kurtosis range). Therefore, t-test were used to analyse the non-locomotor responses in Piece B.

T-test result shows a significant differences of non-locomotor movement responses between groups in Piece B, at the level of 0.01. The partial eta squared was at the level of 0.21, have the *d* value (the interpretation of Cohen's *d*) of 1.03, which mean the differences between both Group 1 and Group 2 was a large effect size.

Table 4.10

Confidential interval for non-locomotor movement responses from both groups in Piece B

(1) group	(2) group	Mean Difference	SE	P value	95% CI of difference	
					LB	UB
1	2	-8.69	2.22	0.00	-13.13	-4.25

P<0.01

Table 4.10 shows the significant differences at the level of 0.001 in the mean difference between both groups.

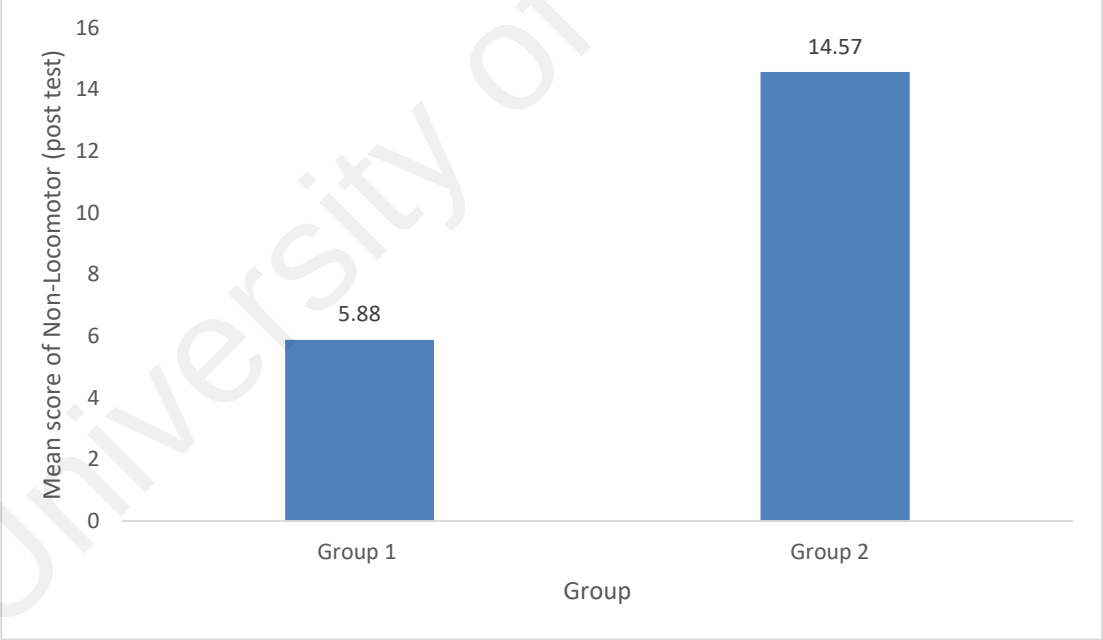

Figure 4.4 Mean score of non-locomotor movement from both groups in Piece B

Figure 4.4 shows the differences between two groups for adjusted mean score of non-locomotor after removing the effect of pre-test score as a covariate. Group 2 shows

42.31% higher in non-locomotor movement responses, as compare to Group 1. This different was significant, as the p value was lower than 0.01. The non-locomotor movement treatment had and large effect on helping children synchronised non-locomotor movement responses to music pulse, in Piece B. Result from Piece A and Piece B shown similar result, where Group 2 who received non-locomotor movement shown higher synchronised non-locomotor movement. We can conclude that through lesson and modelling from teacher, children are able to learn to synchronised non-locomotor movement to music pulse, regardless the music time whether in 4/4 time or ¾ time.

From the above analyses, locomotor treatment increased the locomotor movement responses to the Group 1; while non-locomotor treatment increased the non-locomotor responses to the Group 2. Children from Group 1 who received locomotor treatment, increased the synchronise of locomotor movement to music. This was significant higher in both Piece A and Piece B. Meanwhile, children from Group 2 who received non-locomotor treatment increased significantly higher in non-locomotor movement. Therefore, movement synchronised to music pulse can learn through lesson and teacher modelling. Both locomotor and non-locomotor treatments have similar effect in increasing the synchronising movement to music.

Table 4.11

Locomotor Movement Responses

Piece	Group	Mean Square	P value	Effect Size
A	1	685.66	0.001	0.88
	2	49.66		
B	1	1821.58	0.00	1.17
	2	33.54		

P<0.01

Table 4.11 compared locomotor movement responses between two groups. Group 1 shows higher synchronised locomotor movement as compare to Group 2, in both pieces. The differences between groups were statistically significant, as the p value was lesser than 0.01 ($p<0.01$). Large effect size ($r^2 > 0.8$) were found in both Piece A and Piece B. Result indicated the synchronising of locomotor movement to music are able to improve through training.

Table 4.12

Non-locomotor Movement Responses

Piece	Group	Mean Square	P value	Effect Size
A	1	56.22	0.00	1.04
	2	369.18		
B	1	8.104	0.00	1.03
	2	1101.63		

P<0.01

Table 4.12 summarises the result of comparing non-locomotor between two groups. Group 2 shows higher synchronised non-locomotor movement in both pieces. This differences between groups were statistically significant, as the p value was less than 0.01. Large effect size ($r^2 > 0.8$) were found in both Piece A and Piece B.

In summary, these results demonstrated that both locomotor and non-locomotor movements were equally important and effective in improving children's movement synchronisation with music. The effect size for both movements in Piece A and Piece B were larger than 0.8, which showed that both Treatment A (locomotor lessons) and Treatment B (non-locomotor lessons) were very effective in increasing movement synchronisation with music.

4.2.3 Total movement responses

Locomotor responses data and non-locomotor responses data were combined to analyse total movement responses. The analysis of total movement responses was aimed to find out if there is any significant relationship between the two movement types. Are Group 1 increased significant higher of total movement than Group 2 or vice versa? Are

children synchronised movement to music better with locomotor or non-locomotor movement? Are children preferring locomotor movement or the other? Collected data were first checked for normality to decide whether to use t-test or non-parametric (Mann-Whitney) test.

Table 4.13

Analysis of Normality for Both Groups in Total Movement Responses

Piece	Group	Skewness	Kurtosis
A	1	-1	0.67
	2	-0.43	0.13
B	1	-0.93	0.43
	2	1.12	2.54

Collected data were checked for normality. Table 4.13 shows that all total movement were normally distributed (skewness within -2 to 2 and kurtosis within -4 to 4). Therefore, the t-test was used in analysing the differences in both Pieces.

Table 4.14

Homogeneity between groups in Piece A

	Group	N	Mean	SD	T	P value
Total Movement	1	29	19.24	7.53	0.4	0.69
	2	31	18.48	7.03		

p>0.05

Table 4.14 shows the improvement of total movement from both groups. Group 1 (M=19.24) have a higher value in total movement responses than Group 2 (M=18.48), but no significant difference was found. The null hypothesis was therefore accepted. There was no significant difference between locomotor and non-locomotor lessons in synchronizing movement to music among five- and six-year-old children in Piece A.

Table 4.15

Homogeneity between groups in Piece B

	Group	N	Mean	SD	T	P value
Total Movement	1	29	25.47	9.27	0.96	0.34
	2	31	23	10.73		

p>0.05

Similar results were found in Piece B. Table 4.15 shows that Group 1 has a higher value in total movement responses compared to Group 2, but this difference was not significant difference between locomotor and non-locomotor lessons for young children's movement that synchronized with music.

In conclusion, both Group 1 (M=19.24) and Group 2 (M=18.48) increased the synchronisation of total movement in Piece A. Similar results were found in Piece B, Group 1 (M=25.47) and Group 2 (M=23) increased the synchronisation of total movement with music in post-test, as compare to pre-test. Therefore, both locomotor and non-locomotor lessons were equally affective in synchronizing movement to music in this study.

4.2.4 Movement Observation

Other than statistical analysis methods, a Movement Observation Form was devised, to collect the movement responses from both pieces. This observation aimed to find out the preferred movement and the movement type that synchronised most to music pulse by young children at the age of five and six. All movement response that synchronised to musical pulse were collected, and random movements that were not synchronised to music were not consider in this observation. There was no limit on how many movements can each child responses. All movement response that synchronised to music were collected. Movement responses from children were categorized according to movement type and was based on the movement that taught by researcher during the six hour lessons. Locomotor movement included walking, running, jumping, hopping, skipping, and leaping, whereas non-locomotor movement included bending, stretching, twisting, swinging, striking, turning, shaking, falling, and bouncing. Movements that were not taught during the lesson were categorised under "other".

Table 4.16

Locomotor Movement Responses according to Movement Type in Piece A

Type	Categories		Number	Percentage
Locomotor	Walking		45	33.09
	Running		34	25
	Jumping		36	26.47
	Hopping		5	3.68
	Skipping		14	10.29
	Leaping		2	1.47
	Others	Crawling	0	0
			136	100

Table 4.16 shows the synchronised locomotor movement responses by 61 students in Piece A. Walking movement responses was found to be the highest among all movement responses recorded. 45 out of 136 recorded movements were walking. Most children were preferred to walk when the music was played. Jumping was found to be the second preferred movement, which was just 6.62 % lower than the highest movement response. This was follow by running which has 25% responses. Skipping was another preferred movement by children which has 14 responses. There are only 5 hopping and 2 leaping movements by the children during the experiment.

Table 4.17

Non-locomotor Movement Responses according to Movement Type in Piece A

Type	Categories		Number	Percentage
Non-locomotor	Bending		4	3.03
	Stretching		2	1.52
	Twisting		9	6.82
	Swinging		28	21.21
	Striking		11	8.33
	Turning		28	21.21
	Shaking		13	9.85
	Falling		1	0.76
	Bouncing		11	8.33
	Others	Lifting	16	12.12
		Clapping	2	1.52
		Swaying	7	5.3
Total			132	100

Table 4.17 shows both swinging and turning were the highest non-locomotor movement responses to music, which is 21.21 % each. Most children preferred swinging and turning when the music was played. Lifting was found to be the second preferred movement, which was just 9.09% lower than the highest movement responses. This was follow by shaking, which has 13 movement responses. Striking and bouncing were found to be the next preferred movement, which has 8.33% responses each. Twisting and swaying were having the similar responses, which were only 1.52% different. Only 4 responses for bending; and 2 responses for stretching and clapping by the children during the experiment.

Table 4.18

Locomotor Movement Responses according to Movement Type in Piece B

Type	Categories		Number	Percentage
Locomotor	Walking		38	34.86
	Running		22	20.18
	Jumping		26	23.85
	Hopping		5	4.59
	Skipping		14	12.84
	Leaping		1	0.92
	Others	Crawling	3	2.75
			109	100

Table 4.18 shows the locomotor movement responses in Piece B. Result were similar with Piece A, walking was found to be the highest non-locomotor movement responses. 38 out of 109 were walking. This was follow by jumping, which was just 11.01% lower than the highest movement responses. Running was found to be the third preferred movement, which has 20.18%. This was follow by skipping which has 14 responses. 5 hopping and 3 crawling movement were found, and only 1 leaping movement responses in this experiment.

Table 4.19

Non-locomotor Movement Responses according to Movement Type in Piece B

Type	Categories		Number	Percentage
Non-locomotor	Bending		6	4.23
	Stretching		5	3.52
	Twisting		1	0.7
	Swinging		38	26.77
	Striking		7	4.93
	Turning		27	19.01
	Shaking		4	2.82
	Falling		0	0
	Bouncing		15	10.56
	Others	Lifting	17	11.97
		Clapping	0	0
		Swaying	22	15.49
Total			142	100

Swinging was found to be the highest among all non-locomotor responses in Piece B. 38 out of 142 recorded movements were swinging. There was a big difference between the highest and second preferred movement. Turning was found to have 19.01%, which was 11 different than the highest movement responses. This was followed by swaying which was just 3.52% lower than turning responses. 11.97% lifting and 1056% of bouncing movement responses were found. 7striking, 6 bending, 5 stretching, and 4

shaking out of 142 movement responses were found. Only one twisting movement by children during the experiment. No falling and clapping found in Piece B.

Result from observation indicated the preferred movement by children aged five and six-year-old in the mentioned two pieces. This specific preferred movement type by children will provide a clear information for teachers in planning their lesson accordingly. Similar result was found in both pieces for locomotor movement responses, from the highest to the least movement response. Most children walked when the music was played. Walking was found to be the highest in both pieces, with more than 30% responses, as compared to other movements. The second preferred movement was jumping, where it has more than 23% responses in both pieces. Running was another movement that have high responses, more than 20% were found in both pieces. This was followed by skipping and hopping, while leaping was the least movement found. Crawling was a creative movement by children which was not been taught during the lesson. Peer imitation was observed in this study, even with the movement that was not taught by teacher. One child started to crawl and another two was imitating and following the movement and playing around. Researcher noticed children tends to move with locomotor movement for a longer period of time. There were one group of children moved in a big circle for the entire piece. They walked, sometimes hopping, running or jumping. They were a little unaware of the change of dynamic or articulation, but when they did, they would change to another movement accordingly. As compare to non-locomotor movement, children who involved with locomotor, tends to keep moving forward.

Next, non-locomotor movement seems to have variety of responses. Children were spontaneously lifting, swaying and clapping, which were not taught during the six lessons. Swaying was the most preferred non-locomotor movement which has more than 21%in both piece. This was follow by turning, which has almost 20% in both pieces. Researcher

noticed children tends to be in their imagination world while performing with non-locomotor movements. During Piece A (*William Tell overture)*, where the piece was lively, aggressive and restless, children tends to shake their body, striking (fighting movement) and bouncing. While in Piece B (*Sleeping Beauty*), a waltz like gentle music, children tend to sway with the three beats, lifting and bouncing. Besides, peer imitation and communication was found. Children not just imitate their peer but communicate with their movement. There was a boy started to bounce around, and another boy followed few seconds later. After a while, they started to strike to each other, imagining holding a sword. As compared to locomotor movement, children who involved non-locomotor movement tend to perform it within a shorter period of time. They would swing for few second and stop, paying attention to the music and started another new movement. Researcher also found that children were more aware with the change of dynamic and articulation when they involved in non-locomotor movement. To conclude, children tend to keep a locomotor movement for a longer time and a little unaware of the change, while for non-locomotor movement, they were more aware with the musical change, and tend to stop moving, paid attention to the music and changed the movement response frequently.

4.3 Research Question 2: What is the relationship between locomotor movement and gender among young children?

The second aim of this study was to find out the relationship between movement and gender among young children. Collected data was categorised based on gender for analysis purpose, in order to find out the effect of gender in the locomotor movement responses with music. Only pre-test score was used in analysing the effect of this variable. Post-test score which was affected was not used in order to find out the natural behaviour among the young children.

The collected data were first checked for normality through SPSS, in order to select suitable test to be used for analysis. Data skewness within the range of -2 to 2, and kurtosis within the range of -4 to 4 were considered to be normally distributed, and t-test would be used in this instance. If skewness and kurtosis were found to be out of range mentioned, non-parametric (Mann-Whitney) test would be used instead.

Table 4.20

Analysis of normality for locomotor responses according to gender in Piece A

Variable	Gender	Skewness	Kurtosis
Pre-Locomotor	Male	1.06	0.00
	Female	1.71	1.69

Table 4.20 shows the normality analysis for male and female in Piece A. All data were in range (skewness within -2 to 2; kurtosis within -4 to 4). The data was then viewed in box plot, in order to check the normality.

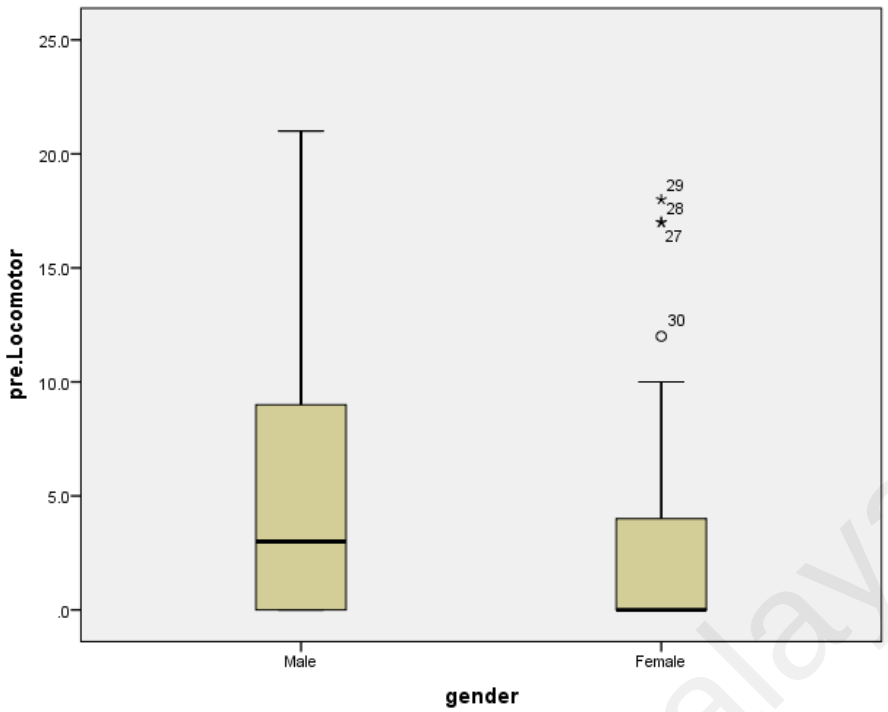

Figure 4.5 Normality test of gender in pre-locomotor movement in Piece A

Although skewness and kurtosis as shown in Table 4.20 were in the range explained, and normality were assumed; outliers were taken into consideration in this case. Figure 4.5 shows that there were three outliers among female participants from the data collected. Therefore, data set was not normally distributed. Mann-Whitney test were chosen for this analysis.

Table 4.21

Homogeneity of groups between gender in Piece A

	Gender	N	Mean	SD	Z	P value
Pre- Locomotor	Male	27	5.41	6.73	-1.16	0.25
	Female	34	3.21	5.59		

$p>0.05$

As shown in Table 4.21, male has higher response in locomotor movement in Piece A. But there was no statistically significant relationship found between male and female, as the p value was larger than 0.05 ($p>0.05$). Results indicated that the relationship which existed between the two variables was due to chance. The null hypothesis was therefore accepted, and gender was not an effective variable in Piece A.

Table 4.22

Analysis of normality for locomotor responses according to gender in Piece B

Variable	Gender	Skewness	Kurtosis
Pre-Locomotor	Male	1.20	0.31
	Female	1.01	0.17

Table 4.22 shows the normality analysis for male and female in Piece B. All data were in range (skewness within -2 to 2; kurtosis within -4 to 4). The data was then viewed in box plot, in order to check the normality.

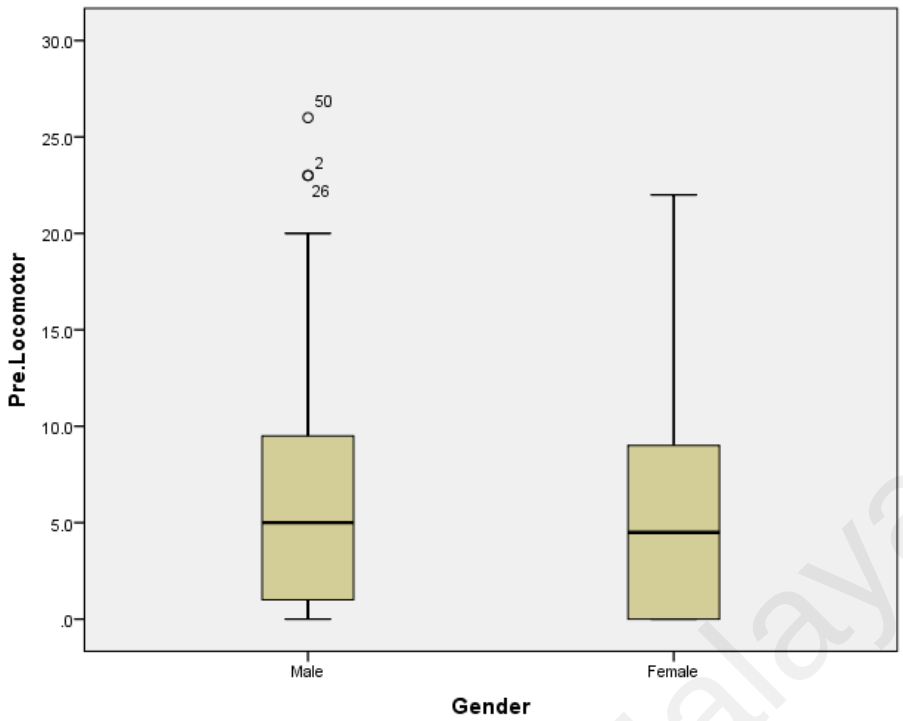

Figure 4.6 Normality test of gender in pre-locomotor movement in Piece B

Although skewness and kurtosis as shown in Table 4.22 were in range explained, and normality were assumed; outliers were taken into consideration in this case. Figure 4.6 shows that there were three outliers among female participants from the data collected. Therefore, data set was not normally distributed. Mann-Whitney test were chosen for this analysis.

Table 4.23

Homogeneity of groups between gender in Piece B

	Gender	N	Mean	SD	Z	P value
Pre- Locomotor	Male	27	9.000	5.7579	-0.235	0.814
	Female	34	8.382	5.9646		

P<0.05

According to Table 4.23, female showed higher locomotor response in Piece B. But this difference was not statistically significant, as the p value was larger than 0.05 ($p>0.05$). The relationship between two variables was due to chance. Therefore, the null hypothesis accepted, and gender was not an effective variable in Piece B.

No statistically significant relationship was found between male and female in locomotor movement, both in Piece A and Piece B. Results indicating that the relationship which existed between two variables was due to chance. The null hypothesis was therefore accepted. Gender was not an effective variable locomotor movement response in this study. Although it was not statistically significant, some fascinating observation was noticed. Researcher was using waltz and dance image while introducing ¾ time. During the lesson, girls showed big interest in dance, they walked in waltz movement, holding dress and turned around; while boys tend to enjoy other movements, such as running.

4.4 Research Question 3: What is the relationship between non-locomotor movement and gender among young children?

The collected data was now analysed according to gender, to find out the effect of gender in synchronizing non-locomotor movement with music. Only the pre-test score was used in analysing the effect of this variable, in order to find out the natural behaviour in gender differences.

Table 4.24

Analysis of normality for non-locomotor responses according to gender in Piece A

Variable	Gender	Skewness	Kurtosis
Pre-Non-Locomotor	Male	0.33	-0.99
	Female	1.24	0.61

According to Table 4.24, skewness and kurtosis were in range for both male and female. Therefore, it is considered as normally distributed, and t-test was used in considered.

Table 4.25

Homogeneity of groups between gender in Piece A

	Gender	N	Mean	SD	T	P value
Pre-Non-locomotor	Male	27	8.59	7.20	2	0.05
	Female	34	5.18	6.14		

P<0.05

Table 4.25 shows a higher non-locomotor response in male (M=8.59), as compared to female (M=6.14). But this was not statistically significant, as the *p* value was 0.05 (p=0.05). Therefore, the null hypothesis was accepted.

Table 4.26

Analysis of normality for locomotor responses according to gender in Piece B

Variable	Gender	Skewness	Kurtosis
Pre-Non-Locomotor	Male	0.44	-0.63
	Female	0.90	-0.19

Skewness and kurtosis for both male and female in Piece B were all in range, and data set were considered as normally distributed. Therefore, t-test was used to compare the differences between male and female.

Table 4.27

Homogeneity of groups between gender in Piece B

	Gender	N	Mean	SD	T	P value
Pre-Non-Locomotor	Male	27	7.22	8.03	0.46	0.65
	Female	34	6.35	6.63		

P<0.05

According to Table 4.29, male showed higher mean in non-locomotor response, but this difference was not statistically significant, as the *p* value was larger than 0.05.

No statistically significant relationship was found between male and female in non-locomotor movement, both Piece A and Piece B. Results indicated that the relationship which existed between the two variables was due to chance and null hypothesis was accepted.

4.5 Summary of Analysis Results

Locomotor and non-locomotor movement treatments increased the response of movement synchronised with music. Children who attended locomotor lesson, increased significantly in locomotor movement, compared with children who attended non-locomotor lesson. Meanwhile, children who attended non-locomotor lesson increased significantly in non-locomotor movement, as compared to children in locomotor group. Both movement groups increased in synchronisation of movement to music when they were analysed individually, but there was no significant difference found in the total movement responses.

Observation of the movement was provided in a list of types of movements used the most by children. Walking was the highest response recorded from Piece A at 16.79%, while walking and swinging was the highest response (15.4%) in Piece B. None of the movement types was dominant in this study; the highest response was less than 20%. From the result, we may conclude that children were generally active in exploring various possible actions through their body, trying out many new and different types of movements. They even used certain movement types that were not introduced during lessons, such as swaying and crawling. Some children combined different movements while listening to music, such as turning and walking, swinging and bouncing, and etc.

There was no significant difference between male and female in their movement responses to music. Therefore, locomotor and non-locomotor movement were equally effective for boys and girls, at the age of five and six-years-old.

CHAPTER 5: DISCUSSION AND CONCLUSION

5.1 Introduction

The results of the experiments and analysis have revealed several conclusions that would be helpful in pedagogical practice, as well as in general music education and children's learning strategies. A comparison of gender and movement type served as an overall structure for these conclusions. An analysis of the results for the selected variables (locomotor and non-locomotor movement) guided the following summary of results, discussion, and recommendations for future research.

5.2 Summary of Results

Research Question 1: Is there a significant relationship between locomotor movement and non-locomotor movement in response to music among young children? The purpose of this study was to determine differences between locomotor and non-locomotor movement, as well as gender and movement responses. Results showed that children from both groups have increased in movement responses. Similar results were found in both Piece A and Piece B. Children who attended locomotor movement lessons showed a significant increase in locomotor movement responses, compared to children who attended non-locomotor lessons. On the other hand, children who attended non-locomotor movement lessons displayed a significant increase in non-locomotor responses. To compare the differences between both movements, total movement responses (locomotor and non-locomotor movement) was analysed, to find out whether there was a significant difference between both the locomotor and non-locomotor group in overall movement responses. In conclusion, there was no significant difference between the two movement types. Sims (1985) stated in her research that children from different age group have different movement responses. She found that 5-year-old children often respond to music through locomotor movement, whereas the 4-year-old respond more via axial movement (non-locomotor movement). However, this was not significant at the present study. Sims'

research was to identify the natural movement responses through music, whereas this study aims to find the improvement of movement responses after training. Results showed that both types of movements played an important role in guiding children to synchronize movement to musical pulse, and both movement types are equally effective in this study. Children has increased in the understanding of synchronisation, and started to create their own movements (movements that were not taught in lesson).

The preferences of movement were collected according to movement types. Among the 20 movement categories, walking had the highest responses in Piece A and Piece B, although in Piece B, swinging and walking both recorded the highest responses. Throughout the observation, the researcher realized that children enjoyed the activities more when locomotor movements were incorporated. They interacted with friends, chased after one another, and they could sustain the movement longer compared to non-locomotor movement. They were a little unaware of the changes in the music, but the movements were sustained much longer than non-locomotor movement. This phenomenon supported Kogan's statement where children liked locomotor more than non-locomotor movements (2004, p.48). Generally, children who chose to respond with non-locomotor movement would frequently vary the movement, such as changing from swinging to bouncing, and striking. They were more aware with the changes of the music where they will stop, listen carefully to the music and then change their movements accordingly. Most of the time children would be in their imaginary world when they used non-locomotor movement. Children were trying to strike each other, just like holding a sword, imagining that they were having a sword fight; moving around with arms, pretending as driving; and swaying their hands as though they were dancing.

Research Question 2 and 3: What is the relationship between locomotor movement, non-locomotor movement and gender among young children? Data collected were also

analysed based on gender. There was no significant relationship found between gender and movement type in response to musical pulse, in both pieces. In fact, both movement types were equally useful in teaching young children aged five and six, regardless of gender.

Although the collected data was not statistically significant, there were some differences between boys and girls that observed by researcher during the study. Piece A was the *William Tell (Guillaume Tell)* Overture by Gioachino Rossini. This piece has a lively character and in 4/4 time. Most children enjoyed the piece by running around and chasing around in the classroom. Locomotor movement was largely used, especially among boys. Boys like to move around with Piece A as they were running, walking, jumping and hopping around. There were a lot of aggressive movement responses from non-locomotor as well, children swing their hand aggressively, turning and bouncing. Meanwhile, girls seemed to be more active in Piece B. Piece B was *The Sleeping Beauty Suite, Op. 66a,* by Tchaikovsky, which has a gentle and waltz-like characteristic. The researcher introduced 3 beats time with dance and waltz-like image, hence this may be the reason why girls were more interested in Piece B. Girls were holding their dresses, walking around with waltz steps, and turning around. For non-locomotor movement, girls like to swing their arms, and bounce a lot. Boys seemed to be less interested with dance since most of them focused on trying and creating the new movement.

5.3 Discussion

Results showed that there was an increased in children's responses to movements that were synchronised with the musical pulse, regardless of the song in different time signatures (3/4 and 4/4 time). From this phenomenon, the experiment results showed that children learned through movement and increased the understanding of musical pulse through movement involvement. However, the length of the piece affected children's

movement responses. Piece B had a lot of "no movement" responses. This was believed to be caused by the fact that children at this age has a shorter attention span, and therefore not suited for music that is longer than three minutes (Piece A- 02:05minute; Piece B- 03:54minutes). This is similar in Butke and Frego (2011, as cited in Butke, 2014)'s study where most children through k-3 (5-year-old) could only focus on a musical selection that is under three minutes.

In this study, children were encouraged to have their movement response to music, and the researcher discovered that children's preference in groups, or as individuals were affected by movement type and age. Most of the 6-year-olds preferred to play in a group with friends; they walked and jumped together, and would invite their friends to move together as well. On the other hand, 5-year-old children often played alone, and lacked of interaction with friends. They were very focused on what they wanted to do, and would try out possible movements that could be done. Gallahue (1976) stated that egocentric behaviour occurred at three- to four-years of age, where children do not enter group activities, but play alongside with other children. At the age of five, children started to enter the group-play stage. However, the five-year-old children in this study did not actively participate in group-play. Meanwhile, most of the girls preferred to play in groups, compared to boys. Boys mostly moved alone or in a smaller group, more often in pairs.

The researcher realized that boys tend to have more ideas in responding to music. They would imagine themselves driving, fighting, and playing the trumpet. For girls, most of them felt insecure to have their own movement. When they tried some new movement, and if none of their friends follow their actions, they would tend to stop that particular movement. This phenomenon was similar to Wehr-Flowers (2006)'s study in jazz

improvisation. Wehr-Flowers found that females displayed a lower level of confidence in themselves.

Peer imitation was found in this study. During the process of analysing the tapes, peer imitation was noticed frequently, both in locomotor and non-locomotor group. Most of the children were being passive when the music played, until one started some movement idea (usually movement that synchronised to music). Other children will then follow and have fun with it. For instance, when a child started to walk with the music, about five to six children will follow the first child and walked around with them. When a child started to pretend driving a car, another boy observed and followed the same movement a few seconds later. Interesting facts were found in peer imitation. If the movement was not synchronised with the music, usually another child will not imitate the movement. This is similar to the research by Alexander (2006), who discovered peer imitation in movements in different tempo, and in the study of Flohr & Brown (1979), who also found peer imitation occurred during creative movement activities.

5.4 Recommendations for Future Research

The current research answered questions about the preference of movement in response to musical pulse, and the impact of both movement categories in synchronizing to musical pulse. This study provided educators some information in music education, such as information about how children respond with movement to different types of music, as well as selecting and involving movement in their music, that are effective in the music classroom for young children.

Further research should include multiple samplings. Participants could be grouped by their backgrounds in order to study specific variables (different movement). For example, an experiment designed with different groups of children, with different musical

background, familiarity of the music and movement and music experiences would be helpful in providing information for topics such as movement creativity, and for students with a variety of disabilities. This study found that most children would naturally create their own body movement in response to music, therefore further research should include motor creativity in music learning. Meanwhile, children were interactive through locomotor movement; further studies may be designed help students with different disabilities.

Current research was completed over a short period of time, with a pre-test, followed by 6 lessons and one post-test session a week later. Future research studies which include longer music lessons that include musical elements (pitch, rhythm, and musical contour) in order to find out the relationship between movement and a variety of musical elements can be considered.

Furthermore, this research suggested that children naturally paired music with movements, therefore educational methods in music should involve this type of learning to build on the existing strengths in children. Future studies should include the specific movement categories and compare those movements. For example, walking was the highest locomotor response while swinging was the highest non-locomotor movement response in both pieces. The comparison of both movements can be included in future lesson. Future researches can also be done by comparing the specific movement types. For example, walking and jumping were both the most and second preferred locomotor movement, thus more studies can be done with more boundaries, such as only these two movements, or only with a specific music piece. Similar researches can be done as well with non-locomotor movement where swinging and turning can be compared in order to have a better understanding of the synchronised movements among young children.

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APPENDIX A

Parental Permission for Participation of a Child in a Research Study

University of Malaya

Title: The Effects of Movement Activities (Locomotor and Non-locomotor) on Young Children's Perception of Musical Pulse and Creativity through Bodily Movement

Description of the research and your child participation

Your child is invited to participate in a research study conduct by Ms. GAN ANN KEE, who is currently pursuing a master degree in music education at the University of Malaya. The purpose of this study is to find out how to help children to be more creative in music learning through body movement.

The duration of the research start from 2nd to 22nd November 2016, at 3-6pm in Kinderland, USJ. This research will involve a pre-test and post-test sessions from your child, to observe the improvement from the study.

Potential Benefits

There are potential benefits for your child to participates in this study. The child will get a chance to explore to more musical knowledge that are not from the usual classroom lesson; he/ she is giving a chance to voice out their opinion which is believe to nurturing creativity thinking in music.

Protection of Confidentiality

We will do everything we can to protect your child's privacy. Your child's identity will not be revealed in any publication resulting from this study.

Voluntary participation

Participation in this research study is voluntary. You may refuse to allow your child to participate or withdraw your child from the study at any time. Your child will not be penalized in any way should you decide not to allow your child to participate or to withdraw your child from this study.

Contact Information

If you have any questions or concerns about this study or if any problems arise, please contact Ms. GAN ANN KEE, 014-9316075.

Consent

I have read this parental permission form and have been given the opportunity to ask questions. I give my permission for my child to participate in this study.

Parent's signature _____

Name : _____

Child's Name : _____

Child's Date of Birth : _____

A copy of this parental permission form should be given to you.

APPENDIX B

MOVEMENT RESPONSES FORM

Group 1 (Piece A)

	Pre-test		Post-test	
	Locomotor	Non-locomotor	Locomotor	Non-locomotor
Participant 1	0	1	23	1
Participant 2	6	3	25	5
Participant 3	16	13	27	1
Participant 4	0	0	21	0
Participant 5	10	3	24	0
Participant 6	0	0	0	9
Participant 7	4	1	24	0
Participant 8	3	3	6	8
Participant 9	20	1	24	5
Participant 10	8	10	25	0
Participant 11	1	1	0	0
Participant 12	0	0	0	6
Participant 13	14	1	2	13
Participant 14	1	3	21	0
Participant 15	1	2	22	0
Participant 16	3	3	21	0
Participant 17	9	7	21	0
Participant 18	0	0	25	0
Participant 19	6	9	14	0
Participant 20	5	0	19	0
Participant 21	0	5	21	0
Participant 22	0	0	25	0
Participant 23	0	0	22	0
Participant 24	10	1	19	0
Participant 25	9	3	1	2
Participant 26	21	0	24	4
Participant 27	17	1	17	2
Participant 28	17	2	14	5
Participant 29	18	1	18	4
Participant 30	12	4	4	8

Group 2 (Piece A)

	Pre-test		Post-test	
	Locomotor	Non-locomotor	Locomotor	Non-locomotor
Participant 1	0	0	8	9
Participant 2	0	0	9	5
Participant 3	0	0	14	9
Participant 4	10	20	8	1
Participant 5	5	13	17	10
Participant 6	0	0	16	6
Participant 7	0	22	12	19
Participant 8	0	0	0	0
Participant 9	15	5	11	15
Participant 10	0	2	15	8
Participant 11	0	11	0	19
Participant 12	0	19	0	19
Participant 13	0	18	0	10
Participant 14	0	22	0	19
Participant 15	0	16	13	9
Participant 16	0	22	6	6
Participant 17	0	15	15	10
Participant 18	0	13	16	8
Participant 19	0	13	14	6
Participant 20	9	12	17	10
Participant 21	4	10	10	3
Participant 22	0	13	16	5
Participant 23	1	1	10	9
Participant 24	0	8	16	6
Participant 25	0	11	2	9
Participant 26	0	12	5	5
Participant 27	0	9	2	17
Participant 28	0	9	0	10
Participant 29	0	14	0	14
Participant 30	0	12	4	26
Participant 31	0	8	7	8

APPENDIX C

MOVEMENT OBSERVATION FORM

Group 1 (Locomotor group), Piece A (William Tell)

NAME	LOCOMOTOR									NON LOCO									
	WALK	RUN	JUMP	HOP	GALLOP	SKIP	LEAP	CRAWL	EXTRA	BEND	STRETCH	TWIST	SWING	STRIKE	TURN	SHAKE	FALL	BOUNCE	EXTRA
JAYSEN	√	√	√	√		√													
CALEB	√	√	√									√	√		√			√	LIFT
COEN	√														√				
NING		√	√	√		√	√												
XUAN	√	√	√	√		√	√												
KEITH															√				
SYN U	√	√	√			√							√						
KAYDZEN	√		√												√	√			LIFT
OSCAR	√		√											√	√				
YI PEI	√	√				√													
HWEE YEE																			
SHENG YI															√				
DEDRIC	√														√				
ZHI LIN	√	√				√													
TRENESE	√	√	√			√													
GLADYS	√	√	√	√		√													
YI MING	√	√				√													
IVAN	√	√	√			√													
YU HAU	√	√											√		√				LIFT
HUI NING	√	√	√			√													
EE JEN	√	√	√			√													LIFT
CARMEN	√	√	√																
SEAN	√	√	√			√													
BELLE	√	√	√			√													
MAY-EN	√																		
KINGSLEY	√	√	√										√		√	√		√	LIFT
SOEVY	√	√	√										√		√			√	SWAY
JO ZHI	√	√	√												√				LIFT
SHERRY	√	√													√			√	
KAI XIN		√											√		√				LIFT

APPENDIX C

MOVEMENT OBSERVATION FORM

Group 2 (Non-locomotor group), Piece A (William Tell)

NAME	LOCOMOTOR									NON LOCO									
	WALK	RUN	JUMP	HOP	GALLOP	SKIP	LEAP	CRAWL	EXTRA	BEND	STRETCH	TWIST	SWING	STRIKE	TURN	SHAKE	FALL	BOUNCE	EXTRA
SHAO XUAN	√		√										√						
SHAO YAN	√												√						
ZEEYOU	√	√	√										√						CLAP
VINNAVAN	√												√						
WEI XIN	√	√	√							√				√	√				TRUMPET, LIFT , SWAY
WEI AI	√		√																CLAP, LIFT
EUN-YU	√		√									√	√	√					
TENG YEE																			
JOASH	√	√								√			√		√				
SALLY	√	√	√										√			√			
SHARN LYN												√	√	√		√			LIFT
ALEXIS													√		√				
DIEGO															√				
GABE												√	√	√	√				
JIA XUAN	√		√							√			√			√			LIFT
JIA MING	√		√											√	√	√			
HONG CHEN	√	√	√	√										√ (GUN)	√	√			SWAY
ELOISE	√		√							√			√			√			LIFT, SWAY
ELISE	√		√										√	√		√	√		SWAY
YEW KAI	√	√	√								√		√		√			√	LIFT
ZE KAI	√	√	√								√				√				LIFT
AINSLEY	√	√	√										√		√	√			
JIE EN		√	√									√	√		√				
HYUN XIN	√	√	√										√	√	√	√		√	
SHAN YIN	√												√		√				
TEONG JUN		√										√	√						
DAYREN	√		√									√ (HANDS)		√		√		√	LIFT,SWAY
XIN YING															√			√	SWAY
YU CHENG												√	√					√	
WILLIAM		√										√ (HANDS)	√	√	√	√		√	LIFT
SHU WEI			√										√					√	

APPENDIX C

MOVEMENT OBSERVATION FORM

Group 1 (Locomotor group), Piece B (Sleeping Beauty)

NAME	LOCOMOTOR									NON LOCO									
	WALK	RUN	JUMP	HOP	GALLOP	SKIP	LEAP	CRAWL	EXTRA	BEND	STRETCH	TWIST	SWING	STRIKE	TURN	SHAKE	FALL	BOUNCE	EXTRA
JAYSEN	√	√	√	√		√							√						LIFT
CALEB	√												√		√	√		√	SWAY
COEN								√											LIFT
NING	√	√	√								√		√		√				SWAY
XUAN	√	√	√	√		√	√						√						LIFT, SWAY
KEITH	√	√	√			√													
SYN U	√	√	√	√		√													
KAYDZEN	√		√																
OSCAR	√	√	√												√				
YI PEI	√	√				√									√				LIFT
HWEE YEE	√												√						
SHENG YI													√		√				
DEDRIC															√			√	
ZHI LIN	√	√	√																
TRENESE	√	√	√																
GLADYS	√	√	√			√													
YI MING	√	√	√	√		√													
IVAN	√	√	√			√													
YU HAU	√									√	√		√						
HUI NING	√	√	√			√													
EE JEN	√												√		√				LIFT, SWAY
CARMEN	√		√	√									√		√	√		√	
SEAN	√												√		√				LIFT, SWAY
BELLE	√	√	√										√		√	√			
MAY-EN																			
KINGSLEY	√					√							√						LIFT, SWAY
SOEVY	√	√				√							√		√				LIFT, SWAY
JO ZHI	√		√					√		√			√		√				LIFT
SHERRY	√		√			√							√		√				
KAI XIN								√						√					SWAY

APPENDIX C

MOVEMENT OBSERVATION FORM

Group 2 (Non-locomotor group), Piece B (Sleeping Beauty)

NAME	LOCOMOTOR									NON LOCO									
	WALK	RUN	JUMP	HOP	GALLOP	SKIP	LEAP	CRAWL	EXTRA	BEND	STRETCH	TWIST	SWING	STRIKE	TURN	SHAKE	FALL	BOUNCE	EXTRA
SHAO XUAN			√										√					√	
SHAO YAN		√	√										√					√	
ZEEYOU	√												√						LIFT
VINNAVAN	√	√	√							√									
WEI XIN	√									√			√						LIFT,SWAY
WEI AI	√		√			√							√					√	
EUN-YU			√										√	√	√			√	SWAY
TENG YEE													√					√	
JOASH	√		√			√				√		√	√						
SALLY			√										√					√	
SHARN LYN											√		√		√			√	LIFT,SWAY
ALEXIS													√		√			√	LIFT
DIEGO	√									√	√		√		√				LIFT,SWAY
GABE											√		√	√	√			√	LIFT,SWAY
JIA XUAN	√	√																	SWAY
JIA MING	√														√				
HONG CHEN	√	√	√										√		√			√	LIFT
ELOISE	√	√												√					LIFT,SWAY
ELISE	√	√											√		√	√			SWAY
YEW KAI	√	√											√		√				SWAY
ZE KAI	√												√		√				
AINSLEY													√					√	SWAY
JIE EN													√						
HYUN XIN													√						
SHAN YIN			√										√		√				SWAY
TEONG JUN														√					
DAYREN														√					SWAY
XIN YING															√				SWAY
YU CHENG														√	√				
WILLIAM													√		√				SWAY
SHU WEI													√					√	

APPENDIX D

Lesson plan (locomotor movement)

Session 1

A. Teaching Objective

1. To introduce the general concept of steady pulse.
2. To introduce the general concept of 4/4 time.
3. To introduce the synchronization to the steady pulse through locomotor movement (walking, marching)
4. To introduce the general concept of fast and slow tempo.
5. To encourage children to move creatively and synchronize with music.

B. Teaching equipment and material

1. Speaker
2. Recording- Star Wars, Imperial March
3. Hula Hoop

C. Teaching procedure

1. Teacher introduce the pieces through image and story.
2. Children are requiring to stand inside the hula hoop or move from hoops to hoops, and not allow to step out from the hula hoop (to prevent injury and going too wild.

(5 minutes)

3. Recorded music play on phone and speaker, and children imitate teacher's movement (spot walking and running) with music.

(5 minutes)

4. Children sit down on the floor and have a small discussion on how we can move through that music.

(5 minutes)

5. Teacher vocalize music theme, and discuss the movement that we can try with the music.

(10 minutes)

6. Children were required to do spot walking or respond to music. If children fail to move with the pulse, teacher will comment and discuss with everyone.
7. Children were required to do as much movement as they can, when children do so, teacher praised on them and encourage other children.

(10 minutes)

8. Children listen to recorded music again and move freely to the music without imitating teacher's movement.

(5 minutes)

Session two (locomotor)

A. Teaching objectives

1. To introduce the general concept of steady pulse.
2. To introduce the general concept of 4/4 time.
3. To introduce children to synchronize the steady pulse through locomotor movement (skipping)
4. To introduce the general concept of staccato.
5. To encourage children to move creatively and synchronize with music.

B. Teaching equipment and material

1. Speaker
2. Recording- Can Can by Jacques Offenbach
3. Hula Hoop

C. Teaching procedure

1. Children were required to stand inside the hula hoop, and not allow to step out from the hula hoop (to prevent injury and going too wild)
2. Revise the piece –Star Wars. Turn on the music and let children have fun moving around with the music.

   (10 minutes)
3. Teacher introduce new piece （Can-Can） with image and story (5 minutes)
4. Recorded music play on CD player, and children imitate teacher's movement (skipping and marching) with the music

   (5 minutes)
5. Children sit down on the floor and have a small discussion on how we can move through that music.

   (5 minutes)
6. Teacher vocalize music theme, and discuss the movement that we can try with the music.

   (10 minutes)
7. Children were required to do skip or walk as respond to music. If children fail to move with the pulse, teacher will comment and discuss with everyone.
8. Children were required to do as much movement as they can, when children do so, teacher praised on them and encourage other children.

   (10 minutes)
9. Children listen to recorded music again and move freely to the music without imitating teacher's movement.

   (5 minutes)

Session three (locomotor)

A. Teaching objectives

1. To introduce the general concept of steady pulse.
2. To introduce the general concept of 4/4 time.
3. To introduce children to synchronize the steady pulse through locomotor movement (Running, walking and jumping)
4. To introduce the general concept of fast and slow.
5. To encourage children to move creatively and synchronize with music.

B. Teaching equipment and material

1. Speaker
2. Recording- Hungarian Dance No. 5 by Johannes Brahms
3. Hula Hoop

C. Teaching procedure

1. Children were required to stand inside the hula hoop, and not allow to step out from the hula hoop (to prevent injury and going too wild)
2. Revise the piece –Can Can. Turn on the music and let children have fun moving around with the music.

   (10 minutes)
3. Teacher introduce new piece （Hungarian Dance No. 5） with image and story
   i. (5 minutes)
4. Recorded music play on CD player, and children imitate teacher's movement (running and jumping) with the music

   (5 minutes)
5. Children sit down on the floor and have a small discussion on how we can move through that music.

   (5 minutes)
6. Teacher vocalize music theme, and discuss the movement that we can try with the music.

   (10 minutes)
7. Children were required to do skip or walk as respond to music. If children fail to move with the pulse, teacher will comment and discuss with everyone.
8. Children were required to do as much movement as they can, when children do so, teacher praised on them and encourage other children.

   (10 minutes)
9. Children listen to recorded music again and move freely to the music without imitating teacher's movement.

   (5 minutes)

Session four (locomotor)

A. Teaching objectives

1. To introduce the general concept of steady pulse.
2. To introduce the general concept of 3/4 time.
3. To introduce children to synchronize the steady pulse through locomotor movement (walking)
4. To introduce the general concept of waltz music.
5. To encourage children to move creatively and synchronize with music.

B. Teaching equipment and material

1. Speaker
2. Recording- Lavender's Blue from Cinderella
3. Hula Hoop

C. Teaching procedure

1. Children were required to stand inside the hula hoop, and not allow to step out from the hula hoop (to prevent injury and going too wild)
2. Revise the piece –Can Can. Turn on the music and let children have fun moving around with the music.

   (10 minutes)
3. Teacher introduce new piece （Hungarian Dance No. 5） with image and story

   (5 minutes)
4. Recorded music play on CD player, and children imitate teacher's movement (running and jumping) with the music

   (5 minutes)
5. Children sit down on the floor and have a small discussion on how we can move through that music.

   (5 minutes)
6. Teacher vocalize music theme, and discuss the movement that we can try with the music.

   (10 minutes)
7. Children were required to do skip or walk as respond to music. If children fail to move with the pulse, teacher will comment and discuss with everyone.
8. Children were required to do as much movement as they can, when children do so, teacher praised on them and encourage other children.

   (10 minutes)
9. Children listen to recorded music again and move freely to the music without imitating teacher's movement.

   (5 minutes)

Session five (locomotor)

A. Teaching objectives
1. To introduce the general concept of steady pulse.
2. To introduce the general concept of 3/4 time.
3. To introduce children to synchronize the steady pulse through locomotor movement (Jumping, leaping)
4. To encourage children to move creatively and synchronize with music.

B. Teaching equipment and material
1. Speaker
2. Recording- Minuet by J.S. Bach
3. Hula Hoop

C. Teaching procedure
1. Children were required to stand inside the hula hoop, and not allow to step out from the hula hoop (to prevent injury and going too wild)
2. Revise the piece –Lavender's Blue. Turn on the music and let children have fun moving around with the music.

(10 minutes)
3. Teacher introduce new piece （Minuet by J.S. Bach） with image and story

(5 minutes)
4. Recorded music play on CD player, and children imitate teacher's movement (jumping and leaping) with the music

(5 minutes)
5. Children sit down on the floor and have a small discussion on how we can move through that music.

(5 minutes)
6. Teacher vocalize music theme, and discuss the movement that we can try with the music.

(10 minutes)
7. Children were required to do walk as respond to music. If children fail to move with the pulse, teacher will comment and discuss with everyone.
8. Children were required to do as much movement as they can, when children do so, teacher praised on them and encourage other children.

(10 minutes)
9. Children listen to recorded music again and move freely to the music without imitating teacher's movement.

(5 minutes)

Session six(locomotor)

A. Teaching objectives
1. To introduce the general concept of steady pulse.
2. To introduce the general concept of 3/4 time.
3. To introduce children to synchronize the steady pulse through locomotor movement (Hopping and skipping)
4. To encourage children to move creatively and synchronize with music.

B. Teaching equipment and material
1. Speaker
2. Recording- The Elephant by Saint-Saëns
3. Hula Hoop

C. Teaching procedure
1. Children were required to stand inside the hula hoop, and not allow to step out from the hula hoop (to prevent injury and going too wild)
2. Revise the piece –Minuet by J.S. Bach. Turn on the music and let children have fun moving around with the music.

   (10 minutes)
3. Teacher introduce new piece （The Elephant by Saint-Saëns） with image and story

   (5 minutes)
4. Recorded music play on CD player, and children imitate teacher's movement (jumping and leaping) with the music

   (5 minutes)
5. Children sit down on the floor and have a small discussion on how we can move through that music.

   (5 minutes)
6. Teacher vocalize music theme, and discuss the movement that we can try with the music.

   (10 minutes)
7. Children were required to do walk as respond to music. If children fail to move with the pulse, teacher will comment and discuss with everyone.
8. Children were required to do as much movement as they can, when children do so, teacher praised on them and encourage other children.

   (10 minutes)
9. Children listen to recorded music again and move freely to the music without imitating teacher's movement.

   (5 minutes)

Lesson plan (non-locomotor movement)

Session 1

A. Teaching Objective

1. To introduce the general concept of steady pulse.
2. To introduce the general concept of 4/4 time.
3. To introduce the synchronization to the steady pulse through non-locomotor movement (punching, clapping, and bouncing)
4. To introduce the general concept of fast and slow tempo.
5. To encourage children to move creatively and synchronize with music.

B. Teaching equipment and material

4. Speaker
5. Recording- Star Wars, Imperial March
6. Hula Hoop

C. Teaching procedure

9. Teacher introduce the pieces through image and story.
10. Children are requiring to stand inside the hula hoop, and not allow to step out from the hula hoop (to prevent injury and going too wild.

(5 minutes)

11. Recorded music play on phone and speaker, and children imitate teacher's movement (punching, clapping, and bouncing) with music.

(5 minutes)

12. Children sit down on the floor and have a small discussion on how we can move through that music.

(5 minutes)

13. Teacher vocalize music theme, and discuss the movement that we can try with the music.

(10 minutes)

14. Children were required to do follow the movement or respond to music by their own movement. If children fail to move with the pulse, teacher will comment and discuss with everyone.
15. Children were required to do as much movement as they can, when children do so, teacher praised on them and encourage other children.

(10 minutes)

16. Children listen to recorded music again and move freely to the music without imitating teacher's movement.

(5 minutes)

Session two (non-locomotor)

A. Teaching objectives

1. To introduce the general concept of steady pulse.
2. To introduce the general concept of 4/4 time.
3. To introduce children to synchronize the steady pulse through non-locomotor movement (clapping, bouncing,)
4. To introduce the general concept of staccato.
5. To encourage children to move creatively and synchronize with music.

B. Teaching equipment and material

1. Speaker
2. Recording- Can Can by Jacques Offenbach
3. Hula Hoop

C. Teaching procedure

10. Children were required to stand inside the hula hoop, and not allow to step out from the hula hoop (to prevent injury and going too wild)
11. Revise the piece –Star Wars. Turn on the music and let children have fun moving around with the music.

(10 minutes)

12. Teacher introduce new piece （Can-Can） with image and story (5 minutes)
13. Recorded music play on CD player, and children imitate teacher's movement (skipping and marching) with the music

(5 minutes)

14. Children sit down on the floor and have a small discussion on how we can move through that music.

(5 minutes)

15. Teacher vocalize music theme, and discuss the movement that we can try with the music.

(10 minutes)

16. Children were required to do skip or walk as respond to music. If children fail to move with the pulse, teacher will comment and discuss with everyone.
17. Children were required to do as much movement as they can, when children do so, teacher praised on them and encourage other children.

(10 minutes)

18. Children listen to recorded music again and move freely to the music without imitating teacher's movement.

(5 minutes)

Session three (non-locomotor)

A. Teaching objectives

1. To introduce the general concept of steady pulse.
2. To introduce the general concept of 4/4 time.
3. To introduce children to synchronize the steady pulse through non-locomotor movement (swinging, turning)
4. To introduce the general concept of fast and slow.
5. To encourage children to move creatively and synchronize with music.

B. Teaching equipment and material

1. Speaker
2. Recording- Hungarian Dance No. 5 by Johannes Brahms
3. Hula Hoop

C. Teaching procedure

1. Children were required to stand inside the hula hoop, and not allow to step out from the hula hoop (to prevent injury and going too wild)
2. Revise the piece –Can Can. Turn on the music and let children have fun moving around with the music.

   (10 minutes)
3. Teacher introduce new piece （Hungarian Dance No. 5） with image and story

   (5 minutes)
4. Recorded music play on CD player, and children imitate teacher's movement (running and jumping) with the music

   (5 minutes)
5. Children sit down on the floor and have a small discussion on how we can move through that music.

   (5 minutes)
6. Teacher vocalize music theme, and discuss the movement that we can try with the music.

   (10 minutes)
7. Children were required to do skip or walk as respond to music. If children fail to move with the pulse, teacher will comment and discuss with everyone.
8. Children were required to do as much movement as they can, when children do so, teacher praised on them and encourage other children.

   (10 minutes)
9. Children listen to recorded music again and move freely to the music without imitating teacher's movement.

   (5 minutes)

Session four (non-locomotor)

A. Teaching objectives

1. To introduce the general concept of steady pulse.
2. To introduce the general concept of 3/4 time.
3. To introduce children to synchronize the steady pulse through non-locomotor movement (swinging, turning)
4. To introduce the general concept of waltz music.
5. To encourage children to move creatively and synchronize with music.

B. Teaching equipment and material

1. Speaker
2. Recording- Lavender's Blue from Cinderella
3. Hula Hoop

C. Teaching procedure

1. Children were required to stand inside the hula hoop, and not allow to step out from the hula hoop (to prevent injury and going too wild)
2. Revise the piece –Can Can. Turn on the music and let children have fun moving around with the music.

   (10 minutes)
3. Teacher introduce new piece （Hungarian Dance No. 5） with image and story

   (5 minutes)
4. Recorded music play on CD player, and children imitate teacher's movement (running and jumping) with the music

   (5 minutes)
5. Children sit down on the floor and have a small discussion on how we can move through that music.

   (5 minutes)
6. Teacher vocalize music theme, and discuss the movement that we can try with the music.

   (10 minutes)
7. Children were required to do skip or walk as respond to music. If children fail to move with the pulse, teacher will comment and discuss with everyone.
8. Children were required to do as much movement as they can, when children do so, teacher praised on them and encourage other children.

   (10 minutes)
9. Children listen to recorded music again and move freely to the music without imitating teacher's movement.

   (5 minutes)

Session five (non-locomotor)

A. Teaching objectives

1. To introduce the general concept of steady pulse.
2. To introduce the general concept of 3/4 time.
3. To introduce children to synchronize the steady pulse through non-locomotor movement (swinging, clapping)
4. To encourage children to move creatively and synchronize with music.

B. Teaching equipment and material

1. Speaker
2. Recording- Minuet by J.S. Bach
3. Hula Hoop

C. Teaching procedure

1. Children were required to stand inside the hula hoop, and not allow to step out from the hula hoop (to prevent injury and going too wild)
2. Revise the piece –Lavender's Blue. Turn on the music and let children have fun moving around with the music.

   (10 minutes)
3. Teacher introduce new piece （Minuet by J.S. Bach） with image and story

   (5 minutes)
4. Recorded music play on CD player, and children imitate teacher's movement (jumping and leaping) with the music

   (5 minutes)
5. Children sit down on the floor and have a small discussion on how we can move through that music.

   (5 minutes)
6. Teacher vocalize music theme, and discuss the movement that we can try with the music.

   (10 minutes)
7. Children were required to do walk as respond to music. If children fail to move with the pulse, teacher will comment and discuss with everyone.
8. Children were required to do as much movement as they can, when children do so, teacher praised on them and encourage other children.

   (10 minutes)
9. Children listen to recorded music again and move freely to the music without imitating teacher's movement.

   (5 minutes)

Session six(non-locomotor)

A. Teaching objectives

1. To introduce the general concept of steady pulse.
2. To introduce the general concept of 3/4 time.
3. To introduce children to synchronize the steady pulse through non-locomotor movement (swinging, turning)
4. To encourage children to move creatively and synchronize with music.

B. Teaching equipment and material

1. Speaker
2. Recording- The Elephant by Saint-Saëns
3. Hula Hoop

C. Teaching procedure

1. Children were required to stand inside the hula hoop, and not allow to step out from the hula hoop (to prevent injury and going too wild)
2. Revise the piece –Minuet by J.S. Bach. Turn on the music and let children have fun moving around with the music.

   (10 minutes)
3. Teacher introduce new piece （The Elephant by Saint-Saëns） with image and story

   (5 minutes)
4. Recorded music play on CD player, and children imitate teacher's movement (jumping and leaping) with the music

   (5 minutes)
5. Children sit down on the floor and have a small discussion on how we can move through that music.

   (5 minutes)
6. Teacher vocalize music theme, and discuss the movement that we can try with the music.

   (10 minutes)
7. Children were required to do walk as respond to music. If children fail to move with the pulse, teacher will comment and discuss with everyone.
8. Children were required to do as much movement as they can, when children do so, teacher praised on them and encourage other children.

   (10 minutes)
9. Children listen to recorded music again and move freely to the music without imitating teacher's movement.

   (5 minutes)