

**THE ROLE OF INSTRUCTIONAL SCAFFOLDING  
TO FACILITATE PROBLEM-SOLVING SKILLS  
IN IMPROVISATION**

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# THE ROLE OF INSTRUCTIONAL SCAFFOLDING TO FACILITATE PROBLEM-SOLVING SKILLS IN IMPROVISATION

## ABSTRACT

The purpose of this study was to document and observe the role of instructional scaffolding process (ISP) to assist novice keyboard students at the initial stages of melodic improvisation. The study employed three action research cycles to identify the importance of instructional scaffolding through students learning outcome. The participants consisted of 8 beginner keyboard students (8 years old) from a public school. The duration for each action research cycle was twenty minutes and they were all conducted in the school's music classroom. Three beginner keyboard pieces were introduced to students for the musical activities. The data collection procedure included the documentation and video-recorded lessons of the systematic instructional scaffolding process to facilitate problem-solving in melodic improvisation, and the students' ability in creating own musical ideas in melodic improvisation. The instructional scaffolding processes for each research cycle were videotaped by two digital cameras for data analysis. The framework of the instructional scaffolding processes was guided from the book, *The New Taxonomy of Educational Objectives*, Marzano and Kendall (2007). The process of measuring students' ability to problem-solve melodic improvisation was audio-recorded and their creation was written onto music scores in the third action research cycle.

**Keywords:** scaffolding, problem-solving, improvisation, action research

# THE ROLE OF INSTRUCTIONAL SCAFFOLDING TO FACILITATE PROBLEM-SOLVING SKILLS IN IMPROVISATION

## ABSTRAK

Tujuan kajian ini adalah untuk mendokumenkan dan memerhatikan peranan proses perancah pengajaran (ISP) untuk membantu pelajar keyboard baru di peringkat awal dalam penambahbaikan melodi. Kajian ini menggunakan tiga siklus penyelidikan tindakan untuk mengenal pasti kepentingan perancah pengajaran melalui hasil pembelajaran pelajar. Para peserta terdiri daripada 8 pelajar keyboard pemula (8 tahun) dari sekolah awam. Tempoh untuk setiap kitaran penyelidikan tindakan adalah dua puluh minit dan semuanya dijalankan di dalam kelas muzik sekolah. Tiga bahan muzik (satu bahan muzik untuk setiap kitaran penyelidikan tindakan) diperkenalkan kepada pelajar. Prosedur pengumpulan data termasuk dokumentasi dan video yang direkodkan pelajaran proses perancah pengajaran yang sistematik untuk memudahkan penyelesaian masalah dalam improvisasi melodik, dan keupayaan pelajar dalam mencipta idea muzik sendiri dalam improvisasi melodik. Proses perancah pengajaran bagi setiap kitaran penyelidikan adalah video yang dirakam oleh dua kamera digital untuk analisis data. Rangka kerja proses perancah pengajaran telah dipandu dari buku *The New Taxonomy of Educational Objectives*, Marzano dan Kendall (2007). Kebolehan pelajar masalah menyelesaikan improvisasi melodik adalah audio-merekod sambil ciptaan mereka ini ditulis dalam muzik skor dalam kitaran kajian tindakan ketiga.

**Katakunci:** perancah, menyelesaikan masalah, penambahbaikan, penyelidikan tindakan

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*Optimism is the faith that leads to achievement. Nothing can be done without hope and confidence.*

*Helen Keller*

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## LIST OF ABBREVIATIONS

ISP	Instructional scaffolding process
ARCs	Action research cycles
ARC 1	Action research cycle 1
ARC 2	Action research cycle 2
ARC 3	Action research cycle 3

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## CHAPTER 1

### INTRODUCTION

#### 1.1 Background

The term scaffolding is defined as a form of temporary framework to support workmen at building constructions. The provisional structure will be removed once the construction work is completed. In pedagogical theory, scaffolding is a metaphoric term for systematic instructional techniques to learning and development (Küpers, van Dijk & van Geert, 2014; 2017; Rodgers, 2005). Much like a scaffold for a building, teachers provide guided levels of instructional support and guidance to help students reach higher levels of comprehension and skill acquisition that they would not be able to achieve without assistance (Holton & Clarke, 2006; Wood, Bruner & Ross, 1976). The teachers' support (scaffold) and guidance provided by the teachers are adjustable and temporal, will be gradually removed when students become more confident and proficient at their learning tasks. The support is then raised to another level when a new, greater challenge learning tasks are presented to the students.

According to Rosenshine (2008), educators have employed this explicit sequence of instruction, sometimes with modifications in their teaching styles, to teach students complex cognitive skills such as writing, reading comprehension, problem-solving in mathematics, science concepts, map skills and language acquisitions.

Music teachers are encouraged to provide scaffolding in the development of playing an instrument as well (Elliott, 1995; Hallam 2006; Kennell, 2002). Instrumental lessons normally consist of multiple skills learning such as the learning of aural, cognitive, technical, musical, communication and performing skills. Since these musical activities combine the cognitive functions and physical movements simultaneously,

progressive learning with a focus on the subject matter is essential. Elliott (1995) has suggested scaffolding as one of the teaching-learning strategies to help students find, solve and reduce musical problems (p. 279). Elliott (1995) further elaborated that, to achieve a successful scaffolding environment, thoughtful preparation and planning the execution of the teaching process in advance by identifying the students' level of understanding of the task is important.

## **1.2 Statement of the problem**

Musical problem-solving skills involves performing, music listening, music making (improvisation and composition) and knowledge on the basic elements of music (Elliott, 1995; Hallam, 2006; Wiggins, 2015). Since improvisation is a creative activity (Webster, 1992), it is usually performed without any written improvised music notation. Yet, improvisation communicates the musical spontaneity of emotions (Gorow, 2002) according to the original musical structure as well. Therefore, it is daunting for anyone let alone for students to perform the improvisation on the spot. Kenny and Gellrich (2002); and Kennell (2002) have advised that teaching improvisation must be approached systematically utilizing well-known melodies due to its complexity in the initial stage.

Hence, with the awareness on the complexity of instructing students' improvisation, the advised strategies of systematic instructions are useful to support problem-solving skills in the musical skill learning. However, the significant problem is, how does the music teacher initiate the approach of teaching improvisation to a group of novice music students between the ages of 8-9 years old? What are the underlying principles associated with the mental operations as the students develop the improvisation skills? What are the steps (sequences) in the actual teaching process?

What sort of vocabularies or demonstrations should the teacher use to produce the understanding of musical application to improvisation? Therefore, this study could fill the 'gap' between knowing the facts and doing the process of planning and teaching. The process of actual planning and executing the teaching plans is a valuable experience for the teacher's professional development as well.

In this study, the focus is on the instructional scaffolding process to facilitate melodic improvisation, which entails creating a variation based on the given melody and chord progression. The variations in this study make use of basic passing notes and repeated notes with some changes in rhythmic pattern. At the same time, this study is to describe the instructional scaffolding process (ISP) to beginning keyboard students in melodic improvisation, particularly with regard on its effects in students' response and interaction in the music classroom.

Video and audio recordings will be utilized to measure students' problem-solving skills through their improvisation output. Their improvisation ideas will be written down in music scores as well for clarity purposes. The framework of the instructional scaffolding processes was guided from *The New Taxonomy of Educational Objectives*, Marzano and Kendall (2007) for the mental operations in learning as a teaching guide. Therefore, the findings on these processes could benefit teachers who are keen to explore the systematic methods to instruct improvisation and to encourage the development of creative skills among young beginner music students.

### **1.3 Purpose of the study**

The purpose of this study includes:

1. To describe the instructional scaffolding process in each action research cycle.
2. To gain an insight of the instructional scaffolding process to improve music teaching effectiveness
3. To evaluate student's responses and interaction towards instructional scaffolding learning

### **1.4 Research questions**

1. How do music students interact with and respond to the instructional scaffolding?
2. What are the scaffolding strategies or instructions used by the teacher to facilitate problem-solving skills in music improvisation?
3. How does the teacher's instructional scaffolding process enable the students in achieving the learning goals in improvisation?

### **1.5 Significance of the study**

The contribution of this study is to determine the effects of the instructional scaffolding to students to identify musical problem-solving skills in melodic improvisation. It is also aimed to provide a precise teaching-learning objective with the process of systematic instruction for music teachers to teach other musical skills.



As scaffolding involves interaction between teachers and students, it is advantageous for music teachers to understand the model of scaffolding, which is guiding, fading, transfer of responsibility and to raise scaffolding to another higher level of tasks.

The process of teaching is directed to a learning goal which is focusing and reasoning for a solution, thus the term problem-solving, which involves critical thinking and creative thinking. In this 21st century, creative problem-solving and critical thinking have been identified to be important skills to achieve in education as well as in daily life and work.

### **1.6 Delimitations of Study**

The delimitation of the study is the focus on a small group of novice keyboard students between the ages of 8-9 years old with limited musical experience in singing, listening and performance in music. The melodic improvisation in this study involved the basic element of melodic variations such as repeated notes, passing notes in easy rhythmic patterns.

It will be advantageous to investigate students of different age group and with different level of musical ability to gain new insight of improvisation problem-solving skills. Nevertheless, with the findings of this study, future researchers may resolve to investigate and improve the instructional scaffolding strategies to a higher level of improvisation problem-solving skills.

## **1.7 Definition of terms**

The following presents the theoretical and operational definition of terms for this study:

(1) instructional scaffolding; (2) problem-solving; (3) melodic improvisation; and (4) action research

### **1.7.1 Instructional scaffolding**

Instructional scaffolding is a metaphoric term that refers to the process of systematic teaching method by the teacher or a more skilled adult. It begins by building on students' experiences and knowledge as they are learning new skills. As students master the assigned task, the teacher will gradually withdraw the support.

Hallam (2016); Küpers, van Dijk and van Geert (2014); Meissner and Timmers (2018) found that through effective instructional scaffolding with demonstrations, students' musical skills could be developed positively. As melodic improvisation is considered as a musical skill, the instructional scaffolding is used as a teaching tool to facilitate the initial learning of the musical skill in this study.

### **1.7.2 Problem-solving**

Problem solving is a process of working through details of a problem to reach a solution. It involves recognizing and defining the problem, then generating, evaluating and refining solutions for the problem (Mumford, Baughman & Sager, 2003; Widiasih, Permanasari, Riandi, & Damanyanti, 2018; Wiggins, 2002).

### **1.7.3 Melodic improvisation**

In the musical context, improvisation is a performance that is not practiced, but is invented by the performer in the spur of the moment. Melodic improvisation is a variation of the original melody based on the given chord progression. Simple embellishment such as repeated notes, passing-notes, auxiliary notes and appoggiaturas with simple rhythmic patterns are incorporated for melodic improvisation.

### **1.7.4 Action research**

Action research is a reflective process that allows practitioners (teachers) to search for solutions to everyday, real problems experienced in schools or looking for ways to improve instruction and increase student achievement (McNiff & Whitehead, 2002). Action research is often referred to as ‘practice-based research’ or ‘practitioner research’ (McNiff, 2016, p. 12) as the researchers are usually teachers, principals, managers, administrators and students of tertiary learning.

## **1.8 Conclusion**

Chapter 1 has presented the statement of problem, research purposes, and significance of the study and delimitation of the study. At the end of the chapter, definition of terms was provided.

## CHAPTER 2

### LITERATURE REVIEW

This chapter provides a discussion of the various relevant literatures related to the purpose of this study. Through the reading of the literature, it had inspired the author the necessity to delve on effective teaching in music studies for young students.

Effective teaching has always been an essential element for all educational purposes, particularly useful for teaching specific skills. A systematic method of instructing new material progressively, guiding students during initial practice, checking for students' understanding, encouraging active and successful participation from students and providing all students with a high level of successful learning environment has been highly recommended by most educators. Hence, the metaphoric term, 'scaffolding' teaching technique started in general education (Bruner, 1985; Wood, Bruner & Ross, 1976; Wood, Wood & Middleton, 1978) due to its relevant description of a temporary structure for construction work. In education, teachers are the scaffold, supplying the temporary support to guide students for a deeper understanding in knowledge and skills which are beyond their current ability.

Learning to develop musical skills involves sensory, cognitive, and motor skills (Hallam, 2006, 2016; Lehman & Davidson, 2002). These musical skills function, interact and evolve in complex ways as they required mental, physical, affective, and social cognitions. Rosenshine, Froehlich and Fakhouri (2002) stated that since music has definite core teachings that required guidance for these explicit musical skills, a systematic instruction is needed as a practical teaching model. Hallam (2006, 2016) supported the fact that it is important for teachers to provide scaffolding in the development of musical skills learning especially for new music students. As music

students progress, the teacher may gradually remove the scaffold or bring the scaffold to a higher level of learning. The learning is always developing with more depth as the teacher leads the students to internalize the subject matter.

The purpose of the literature review is to present the related constructs related to the objectives of this study under the following headings: (1) theoretical background of scaffolding; (2) the stages in the scaffolding process; (3) instructional scaffolding in a music classroom; (4) musical problem-solving skills; (5) music improvisation; (6) the *New Taxonomy of Educational Objectives*; Marzano and Kendall (2007) and (7) conceptual framework.

## **2.1 Theoretical background of scaffolding**

The term scaffolding first appeared in the literature when Wood, Bruner and Ross (1976) described how tutors interacted with preschoolers to help them solve a block reconstruction task. According to Wood et al. (1976) when children begin to learn new concepts, they need assistance from teachers and other adults in the form of active support. In the initial stage, they are dependent on their adult support, but as they become more independent in their thinking and acquired new skills and knowledge, the support (scaffold) can be gradually removed.

Wood et al. (1976) theory of scaffolding was particularly influenced by the work of Russian psychologist, Lev Vygotsky (1896-1934). Vygotsky developed a theory of cognitive development of higher mental function particularly on children's learning and understanding in language and speech. He maintained that the most successful learning occurs when children are guided by adults towards learning goals that they could not attempt on their own (Vygotsky, 1934 Russian /1978 English).

Vygotsky (1934) coined the term 'Zone of Proximal Development' (p. 86) to indicate the special learning development level of what is not known but can be achieved with guidance and encouragement. He believed that specific learning occurred in the child's zone of proximal development. Eventually the guidance is removed when the child internalizes the information and becomes self-reliance. However, the term scaffolding was never used by Vygotsky. Wood et al. (1976) introduced the term in their researches on children's learning and defined the concept as scaffolding teaching-learning.

Since Wood and his colleagues have defined the term scaffolding, extensive researches were explored and described of the teaching-learning techniques related to scaffolding in the literature. It was mainly on the general academic subjects such as languages, reading, writing, mathematics and sciences. At the same time, music educationists were acknowledging scaffolding as the teaching-learning to support musical skills as well (Elliot, 1995; Hallam, 2006).

Scaffolding is applied to initial learning of instrumental skills as well when the teacher provides scaffolding on the development of musical skill learning (Hallam, 2006, 2016; Küpers, van Dijk & van Geert, 2014; Meissner and Timmers, 2018). The significance of this systematic teaching allows the students to identify difficulties in a musical task, to clarify on how to solve the musical problems and progress from mistakes to independent learning.

## **2.2 The stages in the scaffolding process**

In order to conduct effective scaffolding teaching strategies, there are certain steps music teachers are encouraged to understand and apply in their teaching (Hallam, 2006; López-Íñiguez & Pozo, 2016; Wiggins, 2015; Wood, Bruner & Ross, 1976). At the initial stage, the music teacher must encourage and maintain the student's interest in the learning material. The learning material must be presented in simple and small stages then progressively improve to more challenging materials. Checking for understanding, getting feedback to minimize students' frustration is essential for progression. The teacher is required to maintain and highlight details on the learning objective to keep the students focused on the goal progressively.

Demonstration of the task from the teacher is required to assist the students for progression and clarity. Demonstration of task as well as providing hints and cues, assessing students' current knowledge and experience then only instruct task appropriately according to students' capability are effective strategies in scaffolding teaching (Belland, 2017; Copple and Bredekamp, 2009; Elliott, 1995).

Previous studies from Silliman, Bahr, Beasman and Wilkinson (2000) suggested using directed and supportive instructions focusing on the task to enhance greater students' understanding. Silliman et al. (2000) had conducted a study on the scaffolding of learning to read for primary-level school children with language learning disability. The conclusion of the study disclosed that by employing explicit and systematic instructions within the learning context had benefitted the children greatly. Instructions that balance the skill and strategy-based learning were most helpful.

Hallam (2006) reiterated teacher's communication skills such as direct instructions, questions and non-verbal gestures were also identified as critical features

to assist students' level of understanding. Hallam (2006, 2016) continued that motivation to learn and the use of praise contribute to shaping student's behavior as well. Students achieve positive emotional impact when they complete a learning task successfully thus, creating higher self-esteem and motivation to carry on to higher level of learning.

To keep students motivated and to raise perseverance level towards learning, teachers should be encouraging, focusing on the learning task without being judgmental (Langer & Applebee, 1986). Eventually, when the learning process has reached a certain absorption level, it would be advisable for teachers to gradually release the responsibility of the scaffold (support) to encourage students to independently problem-solve their future related tasks (Belland, 2014; Wood et al., 1976).

### **2.3 Instructional scaffolding in a music classroom**

According to Belland (2014), instructional scaffolding is not only providing strategies through teacher's demonstrations and verbal instructions to encounter a problem. There must be active, meaningful participation from the students in specific tasks activities. Exposure to specific tasks to generate new knowledge have a significant impact on students' learning (Belland, 2014; van de Pol, Volman & Beishuizen, 2010).

Active participation from students is essential for the related task problems that will lead to desired learning and understanding (Belland, 2014; Hallam, 2015). According to Hallam (2015) through active participation, students' cognitive levels improved, thus enhancing confidence and aspirations with making music. As Dewey (1938) had defined on contemporary education to encourage students to actively



participate in the related tasks not only to promote productive learning, but also to create a desire and nurture reflective thinking through the experiences.

#### **2.4 Musical problem-solving skills**

Problem-solving has been identified as a series of processes to work through details of a problem to reach a solution. It involves understanding and identifying the problem, then generating, evaluating and refining solutions for the problem (Mumford, Baughman & Sager, 2003; Wiggins, 2002). The term problem-solving has been linked often with terms like critical thinking, high order thinking skills, reflective thinking and conceptual thinking. Nevertheless, all these terms are directed to a learning goal which is thinking and reasoning for a solution. Problem-solving is indeed a valuable skill to acquire for every individual as it is a quality that is important in daily life, education and work.

In order to acquire effective musical problem-solving skills, knowledge about the subject matter is needed to identify, analyze the problem and assess the impact of musical solutions (Garrett, 2013; Topoglu, 2014; Younker, 2002). Thinking critically in music, to solve musical related problems, musical concepts relating to the specific musical problem must be understood properly first. This process requires students to actively explore, experiment, improvise, compose, perform, listen to their own music, relate to examples from the standard repertoire, think and discuss their outcome of their musical problem-solving skills.

Acquiring musical problem-solving skills correspondingly encourages esthetic as well as intellectual processes (Tervaniemi, Tao & Huotilainen, 2018). The discipline approach to solving musical problems could translate into other areas of study and flexibility in a work situation as it requires patience and consistent effort.

Music problem-solving involves music listening, music making (composition and improvisation) and knowledge about music that refers to harmony, tonality, musical forms, structures (intervals, scales, and chords) and mood. Hallam (2006); Rosenshine, Froehlich and Fakhouri (2002) have identified progressive musical problem-solving skills that can be applied to the development of reasoning for a musical solution. It has been categorized that the identification of the specific musical problem needing to be solved is the initial step, then to collect information and knowledge pertaining to the problem. Work through the details, apply and explore (adjust and revise), recognize and determine for the better reasoning to the specific musical solution.

Music teachers' role is essential for guiding students to achieve musical problem-solving skills (Kennell, 2002; Pogonowski, 1989). The role of teachers is to support appropriate learning environment and gradually provide motivation for a higher-level critical thinking to acquire musical problem-solving skills, very much like a scaffold (Kennell, 2002). Small (1987) stated that teachers should develop specific questions and related musical exercises to aid musical thought processes for students to reach better understanding in their subjects. Similarly, DeLorenzo (1989) stressed that students need much exploratory experiences in music playing as well as thinking the process of understanding to acquire musical problem-solving skills. Therefore, it is vital for music teachers to guide students systematically, strategize the lesson plans progressively, provide related musical exercises to practice on, check for students' understanding, then, approach to a next higher level of learning.

## 2.5 Music improvisation

The Latin word for improvisation is '*improviso*' which means unforeseen or unexpected. Synonyms to the word improvisation are invention, spontaneity, ad-libbing, extemporizing as referred to the Collins English Dictionary. According to the New Grove Dictionary of Music and Musicians (1980) music improvisation is an elaboration or an adjustment of an existing musical framework. It could be an additional part which is not fully notated; the ornamentation of an existing part, a cadenza passage or variations based on a recurring theme.

Musical improvisation existed in the Western, Asian and "ethnic" art music since the fifth century or even earlier (New Grove Dictionary, 1980). Great composers such as Bach, Mozart, Beethoven, Liszt, Chopin, Ravel and Stravinsky held momentous roles in the performance practice of the 17<sup>th</sup> century Baroque to the 20<sup>th</sup> century Contemporary period as highly skilled master improvisers. They were teachers of improvisation and had incorporated their improvisation ideas into their written compositions as well.

The most common form of musical improvisation of the twentieth century is in jazz music and contemporary pop music such as rock, blues, ragtime, bebop, rhythm and blues, swing big bands, fusion funk, Bossa nova – traditional jazz music to the modern jazz funk music of today. Musicians, singers and composers have embraced the creative art of musical improvisation into their craft and it has evolved into a specialized art in their work.

Improvisation is mostly defined as the creative production of new ideas performing on the spot (Ashley, 2016; Webster, 1992) without any written improvised music notation. Yet, the music communicates the musical spontaneity of emotions and instrumental technique with other musicians (Gorow, 2002).

The improvised music composition is unexpected as the musical ideas are invented by the performers. It involves an ability to create spontaneous musical improvisation within specified musical parameters (Azzara, 2002). These musical improvisational elements can be invented or created into variations based on a chord progression or a motivic development. Musical improvisation can be found in the harmony, melody, rhythm, musical dynamics, mood and articulation (Kenny & Gellrich, 2002).

Previous researchers had highlighted on the work of Wallas (1926) which consists of four main stages of creative process (preparation, incubation, illumination and verification) as a conceptual model for creative activities (Sadler-Smith, 2015). Wallas (1926) summarized that the preparation stage (stage 1) is important as the specific creative abilities or ideas are gathered for new knowledge. At the incubation stage (stage 2), these ideas are retained in the subconscious mind until the illumination stage (stage 3), whereby an inspiration emerged to form the ideas coherently. At the verification stage (stage 4), various explorations are executed for some solutions to the problem.

Webster (1990) was influenced by the stages of Wallas's creative processes but added the motions of convergent and divergent thinking to the creative processes. He believes that to stimulate musical imagination, convergent and divergent activities are greatly encouraged in a music classroom. Convergent activities are planned activities which result a single correct answer only while divergent activities comprise several possible answers. In this aspect, multiple creative ideas are generated and evaluated through problem-solving skills to reach for the best answer to the problem may encourage creative imagination and thinking.

Gordon (2000) stated that improvisation skill acquisition is taught through guidance and when the students are ready to learn. For example, to improvise tonal and rhythm patterns, Gordon (2000) had suggested that teachers should demonstrate a variety of tonal and rhythm patterns in a steady beat for students to imitate and improvise. Through exposure of tonal and rhythm patterns, students experience the sense of tonality and meter.

Kenny and Gellrich (2002) suggested that new improvisers should learn to improvise in one musical style first in the initial stage, before moving on to improvising a more complex style. Improvising in this controlled situation could encourage the skills learnt to extend and to increase the range of other ideas for their own improvisations.

Previous studies by Azzara (1992, 1993, 1999) have found that initial learning to improvise by ear has resulted a positive musical achievement with high aptitude level; towards music learning among students. Azzara (2002) also stressed that students who have acquired improvisation skills by ear will develop their performance further with music reading. Ultimately, the improvisation ability transfers to a student's clearer understanding of music performed from music reading.

Cheong, Chua and Pan (2014) had conducted a study on music improvisation and had stressed the importance of the procedural knowledge and higher order thinking skills in learning improvisation. According to the findings of the study, a teaching-learning framework and a theoretical model of mental processes are essential for a creative music product in improvisation. Through this way, the teaching-learning framework could assist music teachers to set teaching goals and provides the reflection on the progress towards achieving the goals. At the same time, with the aid of having a theoretical model of mental processes, it could support the music teachers to develop effective teaching strategies and clarity for students' thinking skills in music

improvisation. Furthermore, acquiring improvisation abilities systematically enhances general intelligence, academic ability and performance achievement as well in a recent study by Cheong (2019).

Music teachers are aware that music students should be provided with opportunities to acquire improvisation skills. This would enable the students to create music spontaneously, expressively and to develop higher order thinking skills towards music in a nurturing musical environment. Yet, improvisation in educational settings is very different from that in professional environment. For example, how do teachers initiate the approach of improvisation to beginner students in the classroom? What are the underlying principles associated with developing the mental aspects for improvisation? What are the steps (sequences) in the teaching process for teachers to develop for students to acquire improvisation skills? What are the vocabularies used to communicate the ideas for students to improvise?

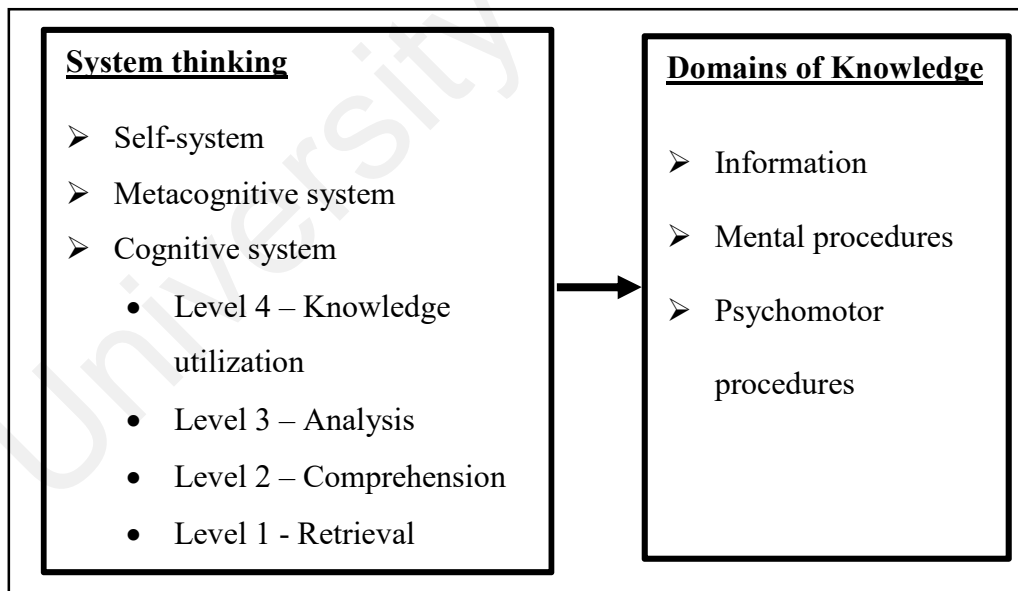
Discussion from the above literature review has concluded that music improvisation is a significant musical skill to achieve for creativity. Scaffolding as a systematic teaching tool may be appropriate to facilitate students to problem-solve melodic improvisation in this study. Therefore, the purpose of this study is to apply the instructional scaffolding to facilitate melodic improvisation. It is to evaluate: (1) the learning process progressively, in terms of steps (the sequences) involved for students to achieve their learning goals; (2) to examine how music students interact with and respond to the instructional scaffolding and (3) the various scaffolding strategies the teacher used for students to problem-solve melodic improvisation. The framework of the instructional scaffolding processes in this study was guided from *The New Taxonomy of Educational Objectives*, Marzano and Kendall (2007) as a benchmark on

the mental processes for students thinking skills and for the teacher to design the teaching plans of the subject matter.

## 2.6 The New Taxonomy

Marzano and Kendall (2007) have revised their work, *The New Taxonomy of Educational Objectives* of the 2001 publication. It has been revised to suit the current environment of standards-based instructions regarding ‘the nature of knowledge and the way the human mind processes information’ (p. xi). It is an educational paradigm that incorporates cognitive skills with areas of learning that influence students’ thinking and provides a research-based theory for teachers to enhance students’ knowledge.

The taxonomy has a two-dimensional model with three systems of thinking (self-system; metacognitive system and cognitive system) represented by one dimension and three domains of knowledge (information; mental procedures and psychomotor procedures) represented by the other dimension (see Figure 1).



**Figure 1: The new taxonomy adapted from Marzano and Kendall (2007)**

### **2.6.1 An example on the three systems of thinking**

For example, assume that a student in a music class is anticipating and thinking of a social outing after the music class, not paying attention to the music teacher's instructions. When the teacher asked the student to pay attention on some new musical task that was presented, the student would have to stop daydreaming and engage on the self-system to pay attention on the new task willingly, the metacognitive system to focus her attention on teacher's instructions and the cognitive system to absorb the new knowledge and participate in the task positively.

The self-system is a system of connected emotions to make decisions about the wisdom of paying attention willingly in a new task (Marzano & Kendall, 2007). It is also a major factor of motivation to learn the new task. When the student decides to pay attention on learning the new task, the metacognitive system is engaged with higher order thinking that enables understanding and analysis of the new task. Once the metacognitive system is engaged, it is continually interacting with the cognitive system that is essential to the completion of the task. Thoughts on comparing, classifying, interpreting, understanding and memorizing are some of the effective cognitive processes of absorbing the new knowledge to complete the new task.

In summary, the flow of information processes always starts with the self-system, proceeds to the metacognitive system, then to the cognitive system and finally to absorb the new knowledge into the requisite knowledge domains (Marzano & Kendall, 2007). These three systems of thinking formed a hierarchical relationship in the flow of information.



### **2.6.2 Domains of knowledge**

According to Marzano and Kendall (2007) knowledge is the most important element to acquire to successfully engage in new task. For example, a student may be highly motivated to learn (self-system thinking), has set specific goals to engage in the task (metacognitive thinking) and willing to think analytically (cognitive thinking) to complete the task but does not have the necessary knowledge to complete it successfully is disheartening.

The domains of knowledge of the taxonomy are organized into three categories: information; mental procedures and psychomotor procedures. According to Marzano and Kendall (2007) these three domains of knowledge are applicable to any subject area. For example, the knowledge specific to the subject of mathematics includes information on calculations and formulas; the knowledge also includes mental procedures, such as application of the correct formulas or reading mathematical codes. There is probably very little, if any, on the psychomotor knowledge that is specific to mathematics, unless it is calculations done on a calculator or an abacus. Whereas, playing an instrument, requires a significant amount of psychomotor knowledge. For example, a piano student has the specific knowledge on musical notation reading includes information on fingering, articulation and rhythm patterns. The knowledge also includes mental procedures, such as detailed reading simultaneously both treble and bass clef notation and transferring all these musical details onto the piano keyboard successfully with precise physical skills expressively through psychomotor knowledge.

### **2.6.3 The mental operations in each level**

The mental operations in each level of *The New Taxonomy of Educational Objectives* within the context of the three-system thinking. In each of the three-system thinking –

self-system; metacognitive system and cognitive system, there are specific subcomponents or mental operations. The cognitive system contains the initial 4 levels of thinking skills while the metacognitive system and the self-system covers the 5 and 6 level of thinking skills. Each level of the thinking skills utilizes specific mental operations (see Figure 2).

<b>Level</b>	<b>System thinking</b>	<b>Mental operations</b>
6	<b>Self – system</b>	Examining importance Examining efficacy Examining emotional respond Examining motivation
5	<b>Metacognition system</b>	Specifying goals Process monitoring Monitoring clarity Monitoring accuracy
4	<b>Cognitive system – Knowledge Utilization</b>	Decision making Problem-solving Experimenting Investigating
3	<b>Cognitive system – Analysis</b>	Matching Classifying Analyzing errors Generalizing Specifying
2	<b>Cognitive system - Comprehension</b>	Integrating Symbolizing
1	<b>Cognitive system – Retrieval</b>	Recognizing Recalling Executing

**Figure 2: System thinking with the mental operations by Marzano and Kendall (2007).**

The instructional scaffolding in this study employed only some specific mental operations of the Cognitive System in levels 1, 2 and 3. The description of these specific mental operations will be discussed in the following text.

#### **2.6.4 Cognitive system - Level 1: Retrieval**

Retrieval consists of three mental operations: (1) Recognizing; (2) Recalling; and (3) Executing. Marzano and Kendall (2007) described the mental operations in level 1 as the 'activation and transfer of knowledge from permanent memory to working memory, where it might be consciously processed' (p. 37). As it is the initial step to generate knowledge to the students, there is no expectation that the student will know the knowledge in depth at level 1. The domains of mental and psychomotor procedures involve the information knowledge.

To demonstrate recognition and recalling of simple details within the domain of information, students must identify and produce accurate information and terms of the specific task (Marzano & Kendall, 2007). The knowledge is not necessarily in depth but to be able to recognize and recall some terms and facts are adequate at this level.

To execute the information, students would have to present the specific task without significant errors (Marzano & Kendall, 2007). The presentation at this level does not imply that students have an understanding on the specific facts yet, only that students could recognize, recall and execute the task without errors.

#### **2.6.5 Cognitive system – Level 2: Comprehension**

Comprehension consists of two mental operations: (1) Integrating and (2) Symbolizing. Marzano and Kendall (2007) described the mental operations in level 2 as 'more

generative in nature' (p.72). The learning process here requires students to actively involve new ideas with their existing knowledge. Hanke (2012), Marzano and Kendall (2007) and Wittrock (1992) had contributed that the integration of new and existing knowledge into students' memory enhances the learning experiences, thus gaining a better understanding of the instructed concepts.

Integrating involves exposure and understanding of new information, making a connection with the existing knowledge. The new information must be taught, to organize coherently with the correct application into instructed concepts (Marzano & Kendall, 2007; Barber, 2009). The students are expected to identify and articulate the various steps of the task systematically. For example, music students would be expected to demonstrate integration of the musical task that was presented by the teacher through the psychomotor knowledge. Consequently, confirmation of the information knowledge, mental knowledge and psychomotor knowledge was understood and presented successfully by the students.

Symbolization involves showing knowledge in some type of nonlinguistic or abstract form (Marzano & Kendall, 2007). For example, music students would necessarily have to write in some basic notation. Confirmation by sight of the improvised pattern reinforces both thinking and listening skills to problem-solve improvisation. 'Integrate knowledge' (McPherson & Gabrielsson, 2002, p.105) as in acquiring competence in reading, performance and aural awareness were needed for students' understanding. This approach was important to help students compare for a solution to problem-solve improvisation on their own in later stages.

### **2.6.6 Cognitive system – Level 3: Analysis**

Analysis consists of five mental processes. The mental operations in level 3 involve examining knowledge in fine detail to generate new conclusion (Marzano & Kendall, 2007). Learning at this level requires more depth and focus. However, in this study, only one mental operation is utilized. The mental operation that will be discussed on is Matching.

Matching involves identifying similarities and differences (Marzano & Kendall, 2007). Students would require the ability to understand and organize the similarities and differences in applying knowledge to a task. It also involved thinking of the details related to the task. The capability to organize suitable application and embellishment of specific melodic and rhythmic ideas into improvisation (Cheong, 2019) is defined in this level of the mental process. Activities such as clapping the patterns, singing, performing and listening would be in the learning process. Through these musical activities on prior to answering the questions, the students would have a clear idea of the features in the music. Consequently, the process of matching generalizations is on determining on how to define similarities and differences involving the three knowledge domains of the taxonomy.

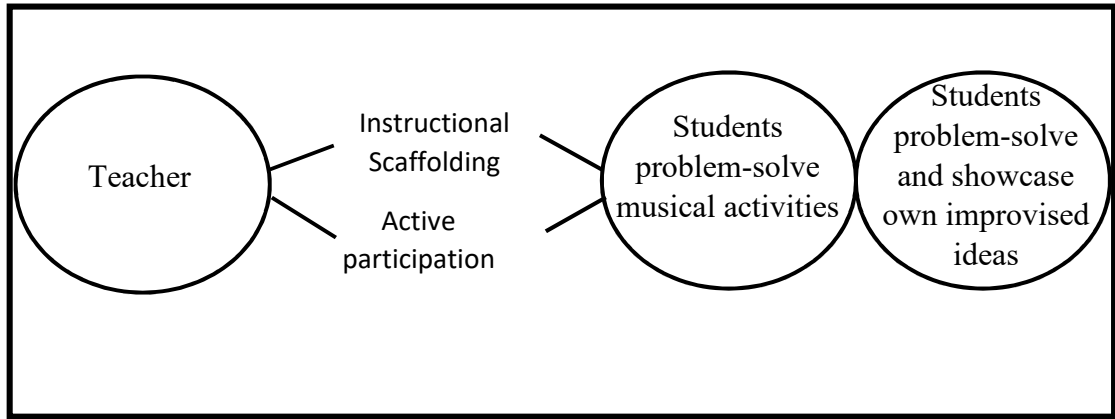
## 2.7 Conceptual framework for the study

Learning how to improvise is a complex task. It is more daunting when the performance is done without prepared musical notation. Improvisation skills can only be developed from practicing following the systematic rules that assist improvisation in the initial stage.

As Webster (1992, 2002, 2018) has suggested that from the beginning of the 21<sup>st</sup> century, teaching and learning improvisation will be significant as both fundamental components explore the musical creativity approaches in music education. Teachers are encouraged to present good demonstrations of musical ideas while students are encouraged to learn and explore sounds through musical experiences actively. Through these musical experiences, creative thinking will then be enhanced.

As Hallam (2015) had stated, creative learning is more productive when it is approached through enjoyable musical activities. This allows integration of teaching and learning to be immediate and ongoing. Hence, the instructional scaffolding as a teaching tool is applied in this study for students' musical development. It is not only a sequence of systematic instructions to teach the students complex cognitive and psychomotor skills, it also entails musical interaction between teacher and students.

The conceptual framework of the instructional scaffolding to facilitate problem-solving skills in improvisation as shown in Figure 3. It illustrates the instructional scaffolding in class which involves the active participation from teacher and students in the musical activities. These musical activities are used as a platform to generate improvisation patterns (new knowledge). The instructional scaffolding process utilize the mental operations of Marzano and Kendall's taxonomy for the application of new knowledge (improvisation).



**Figure 3: Conceptual framework of instructional scaffolding**

## 2.8 Conclusion

This chapter discussed the literature review on the theoretical background of scaffolding, the stages in the scaffolding process, instructional scaffolding in a classroom, musical problem-solving skills, music improvisation, Marzano and Kendall's *New Taxonomy of Educational Objectives* and the conceptual framework of the study.

## **CHAPTER 3**

### **METHODOLOGY**

The purpose of this study is to investigate the role of instructional scaffolding to facilitate problem-solving skills in improvisation. This chapter aims to provide a brief description of the research methodology. The outline of this chapter will be organized as follows: (1) research methods; (2) theoretical framework; (3) participants and setting; (4) action planning and lesson plans; and (5) data collection procedure.

The study discusses the methods used to address the following research questions:

1. How do music students interact with and respond to the instructional scaffolding?
2. What are the scaffolding strategies or instructions used by the teacher to facilitate problem-solving skills in music improvisation?
3. How does the teacher's instructional scaffolding process enable the students in achieving the learning goals in improvisation?

#### **3.1 Research Methods**

The following presents the research methods for the study. The sections are organized as follows: (1) research design; (2) instrumentation; (3) data collection procedure and (4) data analysis procedure.



### 3.1.1 Research Design

The study utilized three action research cycles (ARC) to investigate the research questions which were stated. The theoretical framework (McNiff, 2013) was the structural guide for each ARC (see Figure 4 in 3.2). It involved the process of planning the musical tasks based on the mental operations of the taxonomy, acting out the musical tasks (teaching melodic improvisation step-by-step) and video-observation (focusing on teacher's instructions and instructional scaffolding process, and students' interaction and respond) with two other qualified music teachers to minimize bias observation. Notes on the teacher's reflections, evaluations on the teaching and learning experiences were taken down progressively at each research cycle. Students' progress was observed through video-viewing and detailed field notes were taken at every ARC as well. Modifying scaffolding strategies were applied to help students' understanding at each research cycle for improvement in the learning musical tasks.

Action research is a form of research that enables practitioners to investigate, evaluate their work and search for solutions to daily real problems experiences at work (McNiff & Whitehead, 2002). McNiff and Whitehead (2002) acknowledged that it is a research method for practitioners with the intent to: (1) advance knowledge and theory to improve learning in educational purposes; (2) generate new ideas for potential benefits in own professional development; (3) increase student's achievements; and (4) to achieve better working conditions.

Action research is often referred to as "practice-based research" or "practitioner research" (McNiff, 2016, p. 12) as the researchers are usually teachers, principals, managers, administrators and students of tertiary learning. As an action researcher, a practitioner involves learning to improve personal professionalism in a variety of ways. Robson (2011) stated that action research is a special form of research in the real world,

to investigate, to evaluate and search for solutions then explain what has been done, the reason for the action and the eventual results. McNiff (2016) stated that it would be ideal to transform action learning into action research but to ensure the educational journey is evidence based and to show its authenticity.

To legitimate a knowledge claim in action research, the researcher must test and demonstrate its validity (the quality of being true). This involved producing evidence by describing the action plan, explaining the reason for the plan and the anticipated results, collect information through the procedure involved, produce evidence from the collected information and eventually to identify the findings according to the research questions (Cain, 2011; McNiff, 2016). The researcher's work values are of great importance in action research as well (McNiff, 2016). This will provide the researcher valid reasons to check and raise the standards on the quality and knowledge of the research.

### 3.2 Theoretical Framework

A general form of a cycle of action research:

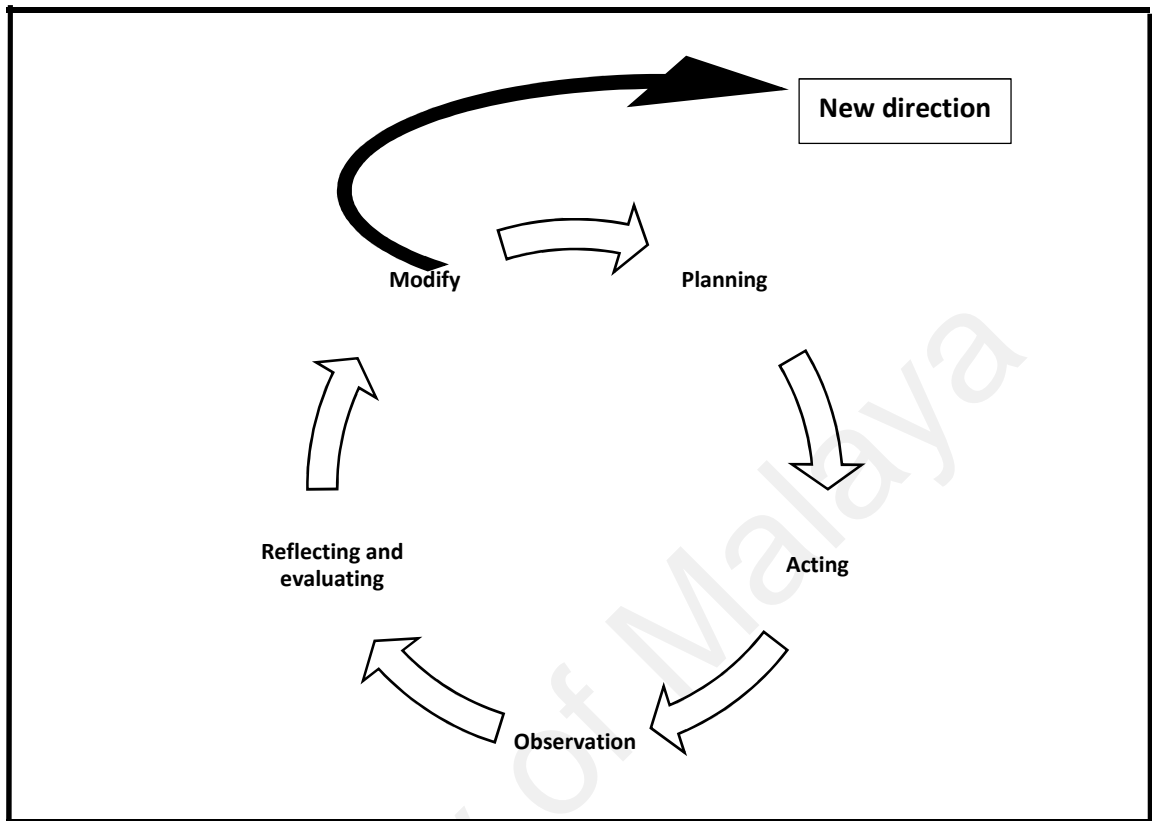


Figure 4: Cycle of action, reflection and modified action, McNiff (2013)

### 3.3 Participants and settings

The study involved 8 students, aged 8-9 years old, from a public school. These students had limited music experience in listening, singing, and playing contemporary music on keyboards. Every student played on their own keyboards in the music classroom. They were able to play easy pieces with right hand. However, these students had no prior experiences in playing melodic improvisation, as they only perform what they see from the music scores.

The action research cycles (ARCs) were implemented in the student's regular once-a-week class in 3 weekly lessons by the teacher (the researcher). There were three action research cycles in this study. The duration of each ARC in the weekly class was 20 minutes.

Letters requesting for permission from the school and parents for their students and children to partake in this study were drawn out and sent accordingly (appendix A1 and A2, pp. 96 – 99).

### **3.4 Action planning and lesson plans for the study**

The teacher (the researcher for this study) aimed to conduct 3 action research cycles using a different lesson plan for each research cycle. The focus was to observe: (1) the scaffolding strategies and instructions used by the teacher to facilitate problem-solving skills on melodic improvisation; (2) students' interaction and responds to the instructional scaffolding; and (3) how the instructional scaffolding process enable the students in achieving the learning goals in improvisation.

The teacher used these musical materials in the action research cycles: (1) Mary had a little lamb – action research cycle 1 (ARC1); (2) Hot cross buns – action research cycle 2 (ARC2); and (3) Baby elephant walk – action research cycle 3 (ARC3). These three music pieces were chosen for the research due to the students' familiarity with the melodies. The students were able to perform these pieces with ease on the keyboards, thus learning improvisation through these pieces would create relaxed responsiveness at the initial stage. The three action research cycles were conducted in 3 lessons by the teacher. The duration of each lesson was 20 minutes.

### 3.4.1 The action research cycles (ARCs)

The ARCs of the instructional scaffolding were conducted by following the lesson plans which the teacher had planned based on the taxonomy by Marzano and Kendall (2007). Adjustment on the instructional scaffolding process for each ARC was modified to check for students' understanding to problem-solve melodic improvisation. ARC1 and ARC2 were generally providing students with new knowledge on improvisation melodic patterns and ideas.

However, there was no demonstration from the teacher in the ARC3. Instead, there were more discussions, prompts, cues and questions to support students to problem-solve the improvisation task on their own, to apply the learned patterns to create melodic improvisation. The students were encouraged to 'mix and match' the patterns which they had learned onto the melody for ARC3. They were also encouraged to create new patterns in ARC3.

Preparation time of 5-10 minutes was given to students to try out their melodic improvisation on their keyboards. The teacher walked round the music classroom to check and encouraged each student to play out their ideas and to listen to the melodies. Once the preparation time was up, the teacher encouraged each student to perform their own improvisation.

The teacher played the actual printed melody with an accompanied bass line, cued in the student's performance on the melodic improvisation (teacher kept tempo by providing the bass line), then teacher played the actual printed melody again and cued in the next student's performance of the melodic improvisation and so on until all eight pupils completed performing their patterns.

Then, the teacher encouraged each student to showcase again their individual improvisation patterns to teacher's accompaniment for reconfirmation. The repeated

performance was done for the teacher to write down the new patterns onto the students' individual music scores. Writing the students melodic improvisation ideas onto the score was to measure students' creative output (Appendix C, pp. 101-104). At the same time, this activity was done to help students confirm by sight the patterns which they had created for the melody.

### 3.4.2 Lesson plan for ARC1 using Mary had a little lamb

Table 1 illustrates the lesson plan for ARC1.

**Table 1: Lesson plan for ARC1**

<b>Activity/Teacher</b>	<b>Mental operations</b>	<b>Instructional scaffolding</b>	<b>Students participation</b>
Introduction/Play melody	Level 1 Retrieval- Recognizing	Do you recognize this melody?	Listen
Sing/Play melody with accompaniment	Level 1 Retrieval- Recalling	Let's sing in solfege. Here is the tempo. Listen... sing	Sing in solfege to teacher's accompaniment
Clap/Play melody with accompaniment	Level 1 Retrieval - Recalling	Let's clap the rhythm pattern. Here is the tempo. Listen...clap	Clap rhythm pattern to teacher's playing

<b>Activity/Teacher</b>	<b>Mental operations</b>	<b>Instructional scaffolding</b>	<b>Students participation</b>
Improvisation/ Demonstration	Level 2 Comprehension – Integrating	Let's improvise the melody. I will show you. Listen.	Listen and look at teacher's playing
Sing/Play improvised Melody	Level 2 Comprehension – Integrating	Imitate my singing. Listen... sing	Sing to teacher's accompaniment
Clap/Play improvised melody	Level 2 Comprehension- Integrating	Imitate my clapping. Listen...clap	Clap the new rhythm pattern
Play/Play the improvised melody	Level 1 Retrieval- Executing	Imitate my playing. Listen...play	Play the improvised melody to teacher's accompaniment
Write/Show the extra notes on the score	Level 2 Comprehension- Symbolizing	We played extra notes in bars 1 & 2. I will write these notes here. Copy these notes here.	Copy the extra notes into their scores.
Play/Play the Improvised melody	Level 1 Retrieval- Executing	Let's play the improvised melody again. Look at your scores now. Here is the tempo. Listen...play	Played the improvised melody to teacher's accompaniment

### **3.5 Data collection procedure**

Throughout the 3 ARCs, data collection methods included audio and videotape recordings of the teacher and students in action with the teaching and learning processes. In addition, notes and reports were taken and kept systematically during the 3 ARCs. Two other qualified music teachers were invited to observe the video recordings and gave their feedback on the data and to improve on the execution of the lesson plans. At the same time, these critical feedbacks allowed the teacher (the researcher) to reflect, evaluate, and modify another level of instructional scaffolding process for the next ARC to stimulate student's understanding to problem-solve melodic improvisation.

Data collection of students' creative output was carried out in ARC3 during the students' individual performance of their melodic improvisation. Their performance was recorded, and their creative output written down onto their individual scores.

### **3.6 Conclusion**

This chapter has presented the methodology of this study. It included the research method, theoretical framework, participants and setting, action planning and lesson plans, and data collection procedures.



## CHAPTER 4

### ANALYSIS OF DATA AND FINDINGS

This chapter presents the analysis of data and findings that were taken from the study on ‘The role of instructional scaffolding to facilitate problem-solving skills in improvisation’. The participants were 8 beginning music students from a public school. As scaffolding has been known as a relevant tool to support skill learning in music education (Hallam, 2006; Kennell, 2002), this study was to document the scaffolding processes and strategies as well as students’ responds to the teaching procedures. Three ARCs were constructed by the teacher, who was also the researcher, to generate the analysis of data and findings for the study.

The findings were presented to address the following research questions:

1. How do music students interact with and respond to the instructional scaffolding?
2. What are the scaffolding strategies or instructions used by the teacher to facilitate problem-solving skills in melodic improvisation?
3. How does the teacher’s instructional scaffolding process enable the students in achieving the learning goals in improvisation?

Data analysis from the teacher’s instructional scaffolding processes were guided from the teacher’s reflections, transcription from video-recorded classes, field notes and experiences throughout the three ARCs. As stated by Richard Winter (as cited in McNiff, 2016, p. 161), “to demonstrate quality action enquires, a reflexive critique nature was important to reflect on one’s own work”. It allowed the researcher to set its limitations as well as strengths in the study. McNiff (2003) shared that keeping a reflective account of information was an analytical process to help examining data for

progress. Since action research was often referred as “practitioner research” (McNiff, 2016, p. 12), experiences from daily real problems at work enabled practitioners to investigate, evaluate and search for solutions for improvement in their work.

The plans in each ARC were aided by McNiff’s (2013) theoretical framework of the general form of an ARC. The actions were: (1) planning; (2) acting; (3) observing; (4) reflecting; and (5) evaluating and modifying to another cycle.

The instructional scaffolding processes were organized systematically in the form of lesson plans for each ARC. The framework of each instructional scaffolding process was guided by the mental operations of the cognitive system in level 1 to level 3, from *The New Taxonomy of Educational Objectives*, Marzano and Kendall (2007)

The process of measuring students’ ability to problem-solve melodic improvisation was audio-recorded. Their creation was written onto music scores in the third ARC by the teacher (Appendix C, pp. 101 – 104).

#### **4.1 Action research cycle 1 (ARC1)**

The instructional scaffolding process (ISP) was guided by the cognitive system of level 1 (Retrieval) and level 2 (Comprehension) from *The New Taxonomy of Educational Objectives*, Marzano and Kendall (2007). The focus was on: (1) vocabulary of the ISP; (2) the sequence of the scaffolding instructions; and (3) students’ respond to problem-solve melodic improvisation.

#### **4.1.1 The plan**

The intend for ARC1 was to generate new knowledge – an improvised pattern, through instructional scaffolding process. The improvised pattern was introduced, demonstrated and instructed for a familiar melody. The instructional scaffolding process was guided by the mental operations of the cognitive system (Marzano & Kendall, 2007) in level 1 (Retrieval) and 2 (Comprehension).

#### **4.1.2 The action/ execution of the plan for ARC1**

A familiar melody was revised and performed by the students to teacher's bass accompaniment. The teacher provided an introduction of the melody as a tempo framework for the students' performance. The instructional scaffolding process was guided by the mental operations of level 1 (Retrieval) in three stages: (1) recognition; (2) recalling; and (3) executing.

Eventually, an improvised pattern for the melody was introduced. Musical activities such as singing the improvised melody, clapping the rhythmic pattern and demonstrations of the improvised pattern were instructed by the teacher. The students were encouraged to carry out these musical activities progressively. As the musical activities progressed, there was a slight change in the instructional scaffolding process as the mental operations had elevated to level 2 (Comprehension) in two stages: (1) integrating; and (2) symbolizing.

Level 1 (Retrieval) involved three stages; (1) recognition; (2) recalling; and (3) execution of knowledge. According to Marzano and Kendall (2007), at level 1, simple details within the scope of information would be presented and the students would not be expected to know the knowledge in depth.

To demonstrate recognition of simple details within the music material, the teacher played the melody with accompaniment on the keyboard and asked the students if they know the melody. The students responded positively. The following questions were asked:

Teacher: Listen to this melody. Do you all recognize this melody?

Can you tell me the title of this melody?

To confirm or to recall the recognition of the melody, the students were asked to sing and clap the rhythmic pattern to teacher's performance on the keyboard.

Teacher: Let's sing and clap the rhythmic pattern. Here is the introduction.

Listen....

Sing with teacher.

Good! Now let's clap the rhythmic pattern. I will point the notation.

Here is the tempo. Listen... Clap

In order to execute the recalled melody through active performance, students were asked to play the melody with right hand to teacher's accompaniment on their keyboards.

Teacher: Now, let's play the melody with your right hand. Here is the introduction.

Listen..... Play.

Let's play and sing. Listen to the tempo of the introduction.

Listen...Play

The musical activity above was performed for recognition of a familiar melody, recalling it through singing, clapping and executing (performance) were the initial steps in the study.

The cognitive processes at level 2 required students to actively combine new ideas with their existing knowledge. Hanke (2012), Marzano and Kendall (2007) and Wittrock (1992) had contributed that the integration of new and existing knowledge into students' memory enhances the learning experiences, thus gaining a better understanding of the instructed concepts.

Integrating process involved exposure and understanding of new information, making a connection with the existing knowledge. The new information must be taught, to organize coherently with the correct application into instructed concepts (Marzano & Kendall, 2007; Barber, 2009).

The following task was video, and audio recorded, while the teacher used these verbs to guide the process of knowledge integration relevant to the initial stage of melodic improvisation:

Teacher: I will play the melody again but with some differences.  
Listen... In which bars do you find the differences?  
Describe the differences.  
Let's sing the different patterns in these bars.  
Here is the introduction. Listen.... Sing.  
Now, let's play together. Here is the introduction. Listen.... Play.

To demonstrate musical symbolization, students would necessarily have to write in some basic notation. Confirmation by sight of the improvised pattern reinforces both thinking and listening skills to problem-solve improvisation. 'Integrate knowledge' (McPherson & Gabrielsson, 2002, p.105) as in acquiring competence in reading, performance and aural awareness were needed for students' understanding. This approach was important to help students' clarity and conciseness for a solution to problem-solve improvisation on their own in later stages. The following musical tasks were transcribed from the video recorded lesson:

Teacher: Draw these notes in these bars. Look..... I will show you how to write it down.  
You have added in these notes here. I will play the pattern. Listen...  
Let's sing the new pattern which you have written. Look, listen... Sing.  
Now, let's play the new patterns. Look at your music score.  
Here is the introduction. Listen...Look and Play.

The systematic instructional scaffolding process approach was to communicate that ‘scaffolded targets’ (Kenny & Gellrich, 2002, p. 126) were essential for acquiring improvisational skills. As in the scenario above, the target was to elaborate on repeated notes as the 1<sup>st</sup> pattern in melodic improvisation. Communication through short directed instructional vocabularies were used with an intend for students’ understanding were useful.

#### **4.1.3 The observation through video and audio viewing of ARC1**

To observe: (1) how the students interact with and respond to the instructional scaffolding; (2) the scaffolding strategies and instructions used by the teacher; and (3) the outcome of the instructional scaffolding process that would allow continuous learning for students in improvisation. The observation was carried out with two other qualified music teachers to minimize biased intentions and to provide critical suggestions for improvement on planning the next ARC.

From the ARC1, these activities were observed: (1) the students’ responds in performance were uncertain to the flow of the teacher’s given tempo framework; (2) instructions given by the teacher were short directed verbs; the scaffolding strategies started in easy steps which gradually became more challenging with the new improvised pattern; (3) the instructional scaffolding process would continue with the mental operations at level 1 & 2 for the next ARC to allow students to experience further learning.

#### **4.1.4 Teacher's reflection and evaluation of ARC1**

From the observation of the video, the teacher realized that these students were beginner students who had limited musical experience in listening and performance. Students' responds during the study was rather chaotic as they were unsure of their performing skills to the teacher's accompaniment tempo.

In an effort to continue with the learning progress, the teacher decided to go through the teaching sequence with the same instructions consistently, but at a slower pace for the next ARC. There would be more repetitions of the musical activities in singing the improvised pattern, clapping the rhythmic pattern, demonstrations from teacher and expected performances from the students.

Encouragement to students to imitate teacher's actions would be repeated. Instructions in simple vocabularies like; "Listen; Sing; Clap; Play; Look; Play it again; Play and sing," would be used frequently throughout the next research cycle as the students had not acquired the psychomotor skills which are connected to the cognitive skills yet. The teacher would have to build that understanding gradually and to encourage more practice from the students.

Musical activities for mental operations at level 1 (Retrieval – recognizing, recalling & executing) were carried out systematically by the teacher and students executed the musical tasks accordingly. Generating new knowledge to problem-solve melodic improvisation was introduced utilizing mental operations at level 2 (Comprehension – integration).

As ARC1 was the beginning of the study for students to problem-solve melodic improvisation, new knowledge had to be introduced in simple steps gradually. Hence, the 'procedural knowledge is executed, whereas information is recognized and recalled' (Marzano & Kendall, 2007, p. 39).



## **4.2 Action research cycle 2 (ARC2)**

ARC2 was the continuation of the study on instructional scaffolding process to facilitate students with problem-solving skills in improvisation.

### **4.2.1 The plan**

The intend for ARC2 was to introduce, demonstrate and instruct a new improvisational pattern to another familiar music material. There was a short revision of the previous learned improvised pattern. The intention was to highlight there could be other melodic patterns to create improvisation.

### **4.2.2 The action / execution of the plan for ARC2**

The instructional scaffolding process was guided by the mental operations of level 1 (Retrieval) and level 2 (Comprehension). As mentioned, level 1 (Retrieval) involved three stages: (1) recognizing; (2) recalling; and (3) executing. These stages were used to review the performance of another familiar music material.

Level 2 (Comprehension) involved two stages: (1) integrating; and (2) symbolizing. These stages would be used for the application of the improvised patterns to the familiar music material.

Simple details within the scope of information were presented and the students would not be expected to know the knowledge in depth. The melody was played by the teacher and the students were asked if they recognized the familiar tune. To confirm the recalling process, students were encouraged to sing in solfege. Then, they were asked to perform (executing) the melody on their individual keyboards accurately. The following was transcribed from the video recorded lesson:

Teacher: I will play this melody. Listen...

Do you recognize this melody?

Students: Yes! It is .....

Teacher: Good. Let us sing the melody in solfege. Here is the introduction.

Listen.... Sing

Good. Now, let us play the melody with the right hand.

Here is the introduction. Listen..... Play and sing

Confirmation on both auditory and motor skills allow for automaticity (Chaffin & Imreh, 2002) in their performance for improvisation in later stages. At the same time, these reviews were made to reduce possible confusion among students.

According to Marzano and Kendall (2007) the Comprehension processes required students to actively involve new ideas with their existing knowledge. There was a short review of the previous improvisation pattern before the presentation of the new improvised pattern. These verbs were used to assist the students on reviewing the previous improvised pattern:

Teacher: We used repeated notes in our previous improvisation exercise.

Now, let's put repeated notes in the new melody.

Which notes would you like to repeat for this new melody?

Let us look at bars 1 and 2...

You may try out the repeated notes pattern on the keyboard first.

Teacher: You may also hum out the melody first then play on the keyboard.

Yes, Rees would like to repeat the 1<sup>st</sup> note... good.

Yes, Adam would like to repeat the 2<sup>nd</sup> note... good.

Sure, Lin. You can repeat the 1<sup>st</sup> and 2<sup>nd</sup> notes. Play and test it out.

Good?

Alright. Now everyone will play your improvised version for bars 1 and 2.

Rees, you start first then Adam then Lin and so on, okay?

Here is the introduction. Listen Rees... Play... Thank you.

Adam, your turn. Listen.... Play.....

According to Rosenshine (2008) a short review of previously covered material is essential. These reviews ensure that students have grasped the previous knowledge before moving on to the next level with minimal difficulty.

Integrating process involved exposure and understanding of new information, thus making a connection with the existing knowledge. The new information must be taught, to organize coherently with the correct application into instructed concepts (Marzano & Kendall, 2007; Barber, 2009).

A new improvised pattern was instructed here, and some time was spent on guiding the students' practice. The objective was to provide enough instruction and demonstration so that students could manage independent practice with minimal difficulty. The new pattern was taught gradually (Brophy & Good, 1986; Hallam, 2006; Rosenshine, 2008; Small 1987) for students' attention on what they were to learn and perform. With the intention to minimize confusion, the new pattern was presented only

in the first two bars. Once the learned strategies were applied, the subsequent bars to improvise were added on. Questions were directed to the students and there was a discussion between the students and teacher.

Teacher: Listen to this new pattern (teacher played the whole 8-bar melody).  
Did it sound different from the repeated notes pattern? (wait for answer).  
How is the melody different? Did it raise a key (a higher note) here?  
(teacher played one bar).  
Did it move by step to the next note? (played another bar).  
Yes... I played a note higher here and then created a bridge here.  
Listen... I will show you how to create that sound....

The students were asked to imitate the pattern on their keyboards. The teacher guided the students practice slowly through singing, listening and performance. These were some of the feedback from the students:

Student 1: That was hard!

Student 2: I like that pattern.

Student 3: I like the sound.

With the aim to increase performance accuracy of the new improvisation exercise, the teacher wrote the added notation onto the students' music scores. She then pointed out the notation, sang, played the written music and encouraged every student to perform together.

Teacher: I shall write the new notes here and here, and that changes the rhythmic pattern.

Do you see the differences?

Do you see the pattern?

Now, we shall sing this new pattern in solfege. I will point the notation.

Here is the tempo. Listen... Sing.

Now, I shall play the pattern. Listen...

I want everyone to play the melody now. Here is the tempo.

Listen... Play and sing.

This form of awareness enabled students to acknowledge visual symbols, listen to the sound as well as create meaning to their performance (McPherson & Gabrielsson, 2002). At the same time, the students learn how to gain experience in playing and observing musical patterns as a structural unit instead of isolated notes (Bamberger, 1996, 1999; McPherson & Gabrielsson, 2002).

#### **4.2.3 The observation through video and audio viewing of ARC2**

The observation was carried out with two other qualified music teachers to minimize biased intentions and to provide constructive suggestions for improvement on the instructional scaffolding process. It was observed that the activities, instructions and the instructional scaffolding process were somewhat like ARC1, except that the pace of the

lesson was conducted at a slower pace. The learning was more focus and with more depth.

Students' performance responds better to the teacher's tempo framework in ARC2. The interaction between teacher and students was more comfortable as the teacher called out their names and encouraged every student to play back the improvised patterns to teacher's accompaniment.

#### **4.2.4 Teacher's reflection and evaluation of ARC2**

From the observation of ARC2, the teacher noticed that students were more alert when they anticipated their names being called out to play back the patterns. When the students realized they made a mistake, they were encouraged by the teacher to play the melody again. It had built up students' confidence to try continually without feeling disheartened. Hence, words of encouragement made a big difference to these beginning music students.

The pace of activities and instructions were slower in ARC2. It served its purpose for deep learning and understanding of the musical skill. There was less anxiety for the teacher and students to generate and produce results in a hurried pace. Hence, the learning atmosphere in class was relaxed and comfortable.

The instructional scaffolding process and demonstrations introduced musical tasks gradually. The vocabularies used in ARC2 were repeatedly clear, short and precise. Added on vocabularies were in question forms, for example: "Do you hear the differences? Did you see the pattern here? What has changed here? Do you like the changes? What about this pattern? Shall we try playing on our keyboards? and so on. At the same time, the teacher supported these questions with descriptive words like: "This

melody has moved a semitone (a tiny step) higher and then back onto the same note, like this...it's like a little 'twitch'... try this on your keyboards now..."

Due to the gradual learning pace of new improvisation patterns, the students enjoyed their lesson even though the learning material was challenging. The positive outcome process from students' interaction and responds had greatly encouraged the teacher to elevate the mental operations to level 3 in the next ARC.

### **4.3 Action Research Cycle 3 (ARC3)**

ARC3 was the continuation of the study on instructional scaffolding process to facilitate students with problem-solving skills in improvisation. The aim of ARC3 was to determine if students could problem-solve the melodic improvisation independently, without teacher's demonstrations.

#### **4.3.1 The plan for ARC3**

The intend of ARC3 was to observe students' understanding to problem-solve melodic improvisation without demonstrations from the teacher. Two different patterns for melodic improvisation, one in each ARC (ARC1 and ARC2) were presented in previous weeks.

The students were encouraged to improvise another familiar music material by applying the learned patterns and to add on their own creative ideas. They were encouraged to 'mix and match' the patterns to the present melody. This activity was carried out without teacher's demonstrations. Questions, prompts, cues and discussions were communicated between teacher and students on the possibilities to problem-solve melodic improvisation for the present melody.

This musical activity was carried out without teacher's demonstrations. At the same time, the teacher would use this activity to measure students' problem-solving skills through their improvisation output. The teacher would ask each student to showcase their improvisation melodies to teacher's bass accompaniment. Then, the students' output would be copied into their individual music scores by the teacher.

The instructional scaffolding process began with the mental operation in level 1 (Retrieval) and level 2 (Comprehension) for reviewing and integrating patterns for another familiar music material. It progressed to level 3 (Analysis) for application of improvised patterns to the music material.

#### **4.3.2 The action / execution of the plan for ARC3**

To review and execute another familiar melody, the instructional scaffolding process utilized the mental operation of level 1 (Retrieval) in their three stages: (1) recognizing; (2) recalling; and (3) executing. The instructional scaffolding process and the musical activities were similar as in ARC1 and ARC2.

At mental operation level 3 (Analysis), the instructional scaffolding process would only utilize one stage of the cognitive system which was: (1) matching. According to Marzano and Kendall (2007) the analysis processes involved examining knowledge in fine detail and eventually, generating new conclusions. 'Matching' explored the ability to understand and organized the similarities and differences in applying the patterns to a task. It also involved thinking of the details related to the structure.

With the aim to help students move towards the task to problem-solve melodic improvisation for the new melody independently, the teacher provided students with these directions:



Teacher: Let's look at the score. Point and sing the melody.

Let us think of a way to create a new pattern... just for bars 1 and 2.

Remember the repeated and passing notes from the previous exercises?

You may put those patterns into your new melody.

Teacher: You may also add on patterns that you think will sound 'good' to your melody.

What would you like to do with the 1<sup>st</sup> note? The 2<sup>nd</sup> note?

I suggest we keep the crotchet rests in bars 1 and 2...

They are the places where we 'breathe'... like taking a rest.

You may sing, hum or try it out on your keyboard... listen to the new melody.

You may want to keep the same pattern in bar 2.... Like a sequence...

Same pattern but different notation.

Or you may want to try something new on your own...

Teacher: Play on your keyboard... Do you like the sound?

Does it fit into my bass accompaniment?

Okay... let's play your new melody.

Who wants to play first? ..... Lina?

Here is my introduction... Listen... Play...

There were some identical improvised patterns from the students when it was time for them to showcase their improvisations. These were some of the student's responses:

- Student 1: Hey, that was my plan (improvisation).
- Student 2: She took my idea! I don't know what to play now.
- Student 3: What about this pattern? (asking quietly...)
- Student 4: Mine is the same as his...

The students were given assurance having an identical pattern was not wrong but were encouraged to have some changes in the rhythmic pattern to make it sound a little different.

- Teacher: Good melody... but if you want it different how about changing the rhythmic pattern?... keep to the same notes...
- I will show you. Listen.... Do you like that?
- Now you try playing it...

Every student was encouraged to demonstrate their improvisation to the teacher's accompaniment. After the 1<sup>st</sup> round of performance, teacher encouraged them to play again but this time to perform their new melodies with more confidence. Then, the teacher wrote out each student's improvisation on the music score for sight confirmation (Appendix C, pp. 101-104).

Teacher: I would like each student to play again your improvised melodies.

After each performance, please bring out your music scores so that I can write out the patterns which you had played.

Rees, please start first. Here is the introduction. Listen.... Play.

### **4.3.3 The observation through video and audio viewing of ARC3**

The observation was carried out with two other qualified music teachers to minimize biased intentions. It was observed that the instructional scaffolding process was conducted in a ‘questioning’ style, more challenging and encouraging students to experiment with patterns on their individual keyboards. There were no demonstrations from the teacher, instead there were more singing, humming and clapping. There were also prompts, cues and discussions to help the students. The teacher walked round to every student enquiring and listening to their improvisation ideas. Students were excited to showcase their improvisation individually and were praised for their participation.

### **4.3.4 Teacher’s reflection and evaluation of ARC3**

The approach of the instructional vocabularies and the instructional scaffolding process was different in ARC3. After the two previous ARCs on generating new knowledge to students, the present ARC encouraged students to demonstrate their understanding of their learned new improvisation skills independently instead.

There were some chaotic moments during the ‘trying-out’ on their own keyboards. The teacher then, instructed the students to bring down the volume button. During the ‘try-out’ session, the teacher walked round the classroom to every student to discuss and prompt the students on their creative ideas. After spending some moment

with every student, the teacher asked the students to showcase their improvisation to teacher's accompaniment.

It was an exhilarating experience for the teacher to observe that the instructional scaffolding process was indeed a systematic teaching tool to support musical skill learning. Students' responds and alertness seems to depend on the outcome validity of the instructional scaffolding process. The outcome validity here was reflected through the students' positive responds and interaction in class. They were excited with their ideas and had shown great enthusiasm in learning. Since the scaffolding theory emphasized that teachers should introduced new knowledge systematically, it has indeed reinforced the teacher to think systematically as well when planning for a lesson with the learning focus on the subject matter.

However, through teaching experience, the teacher would not expect the students to improvise confidently without prompts and cues at this initial stage of learning. Instead, the teacher provided some improvising ideas yet withdrawing demonstrations with the intent to assess students' ability to problem-solve melodic improvisation.

#### 4.4 An overview of the mental operations which guided the instructional scaffolding process (ISP) in ARC1, ARC2 and ARC3

Table 2 illustrates an overview of the mental operations in this study.

**Table 2: Overview of mental operations**

<b>Mental operations</b>	<b>ISP in ARC1</b>	<b>ISP in ARC2</b>	<b>ISP in ARC3</b>
<b>Level 1 (Retrieval)</b>			
Recognizing	√	√	√
Recalling	√	√	√
Executing	√	√	√
<b>Level 2 (Comprehension)</b>			
Integrating	√	√	√
Symbolizing	√	√	√
<b>Level 3 (Analysis)</b>			
Matching			√

**4.5 An overview of the frequent verbs / phrases used in ARC1, ARC2, ARC3  
guided by the mental operations**

Table 3 illustrates an overview of verbs/phrases used in this study.

**Table 3: Overview of verbs/phrases**

<b>Mental operations</b>	<b>Verbs/Phrases</b>	<b>ARC 1</b>	<b>ARC 2</b>	<b>ARC 3</b>
<b>Level 1(Retrieval)</b>				
Recognizing	Listen, do you recognize this melody	√	√	√
Recalling	Listen, sing, clap	√	√	√
Executing	Listen, sing, play	√	√	√
<b>Level 2(Comprehension)</b>				
Integrating	Listen, what has changed here....	√	√	√
	Clap, sing and play	√	√	√
Symbolizing	Copy this note here	√	√	
<b>Level 3 (Analysis)</b>				
Matching	Remember the patterns we had played?			√
	Do you want to change the 1 <sup>st</sup> or the 2 <sup>nd</sup> note of the first bar?			√
	Play the pattern on your keyboard.			√
	Do you like the sound?			√
	Do you want to repeat that pattern here?			√
	How about this new pattern?			√

#### **4.6 Findings for research question 1:**

How do music students interact with and respond to the instructional scaffolding?

In ARC1, it was observed that the students could not understand the teacher's instructions in the beginning. Instructions like, "Sing, listen, play, sing and clap, sing and play, look at the score" were new to the students. The response was slow, and the performance was not on time with the teacher's tempo. In order to overcome the problem, the teacher went through the teaching sequence a few times but at a slower pace. Eventually, the students managed to respond well with the instructions and participated positively in the musical tasks.

Students responded better in ARC2. They managed to execute the musical tasks that were presented. They were also more vocal after playing the different improvisational patterns. Some of the students thought the new pattern was too difficult and were not keen to practice more. After much assurance and encouragement from the teacher, these couple of students decided to try playing a few more times. Eventually, they were pleased with the results.

Students were excited and eager with their learning in ARC3. They were asked to showcase their ideas on a new music material without teacher's demonstrations. There were prompts, discussion and questions from teacher for guidance. After each performance, students were praised for their participation.

In summary, there was a gradual positive change in the students' interaction and responded confidently to the instructional scaffolding. Students' confidence and verbal behavior improved at each ARC.

#### **4.7 Findings for research question 2:**

What are the scaffolding strategies or instructions used by the teacher to facilitate problem-solving skills in melodic improvisation?

With the intent to help students' progress easily to problem-solve improvisation for each new music material, there was always an introduction of the original melodies (music material) in each research cycle. There were musical tasks such as singing the melodies, clapping the melodic patterns or the pulse of the music, playing the melodies on their individual keyboards and pointing to the notation. These activities were formed to align with the mental processes of level 1- Retrieval (Marzano & Kendall, 2007) to help students to recognize, recall and execute the melodies accurately.

Then, to present the improvisational patterns, there were demonstrations from the teacher in ARC1 and ARC2. Students were encouraged to imitate the patterns on their keyboards. Singing aloud the improvisational patterns by the teacher allowed the students to listen critically for accuracy in their performance as well. Clapping the new rhythmic patterns too, enhanced the feeling of the musical pulse in their performances. With the aim to scaffold these musical tasks, the teaching processes were presented at appropriate levels – in easy steps and gradually progress to a next level (Wiggins, 2007; Wiggins & Wiggins, 2008; Wood, Bruner, & Ross, 1976).

A framework of basic instructions used to scaffold the teaching process consisted of vocabularies like, "Listen; sing; clap; play; look; point; repeat the phrase; wait; your turn". These verbs were short and precise, targeted to focus on the learning tasks. At the same time, as each student played back the patterns to teacher's bass accompaniment, the pulse of the music was ongoing, and these short verbs helped students to execute their performance according to the tempo of the music without a break and in sync to the bass accompaniment.



However, in ARC3 the instructions were different as the level of the mental process progressed to level 3 (Analysis – Matching). Students were acquired to fill in the improvisational patterns to a new melody independently. The instructional scaffold verbs became questions to encourage problem-solving skills for the melody. Some of the questions from the teacher were:

“Which bar would you like to play repeated notes?”

“Would you like to keep the 1<sup>st</sup> or the 2<sup>nd</sup> notes of the melody?”

“Do you want to repeat the pattern in this bar?”

“Would you like to have a passing note in this bar?”

“How about changing the rhythmic pattern?”

“Do you like the sound?”

“What do you think of your pattern?”

“Would you like to play the improvised melody for us?”

The scaffolding strategies that the teacher had used were demonstrations. At the same time, words of encouragement for the students to clap, sing, play, look at the score, write and relay play to teacher’s accompaniment were some of the instructional scaffolding strategies in every research cycle.

In summary, the teacher had employed a systematic method to support students to problem-solve melodic improvisation. Every lesson began with: (1) sing and play the original melody; (2) hum or sing the melodic improvisation; (3) clap the improvised

melodic pattern; (4) try/play the melodic improvisation; and (5) play the melody to teacher's bass accompaniment.

#### **4.8 Findings for research question 3:**

How does the teacher's instructional scaffolding process enable the students in achieving the learning goals in improvisation?

According to educational theorists (Bruner,1996; Dewey, 1938; Rogoff, 1990; Vygotsky, 1934/1978), students should be allowed to experience and interact with the learning processes. In this way, learning should take an active role, in a progressive learning curve to construct their own understanding. In a musical context, learning through creating, listening and performing forms the active experiential learning curve for music students (Sawyer, 2011; Wiggins, 2015).

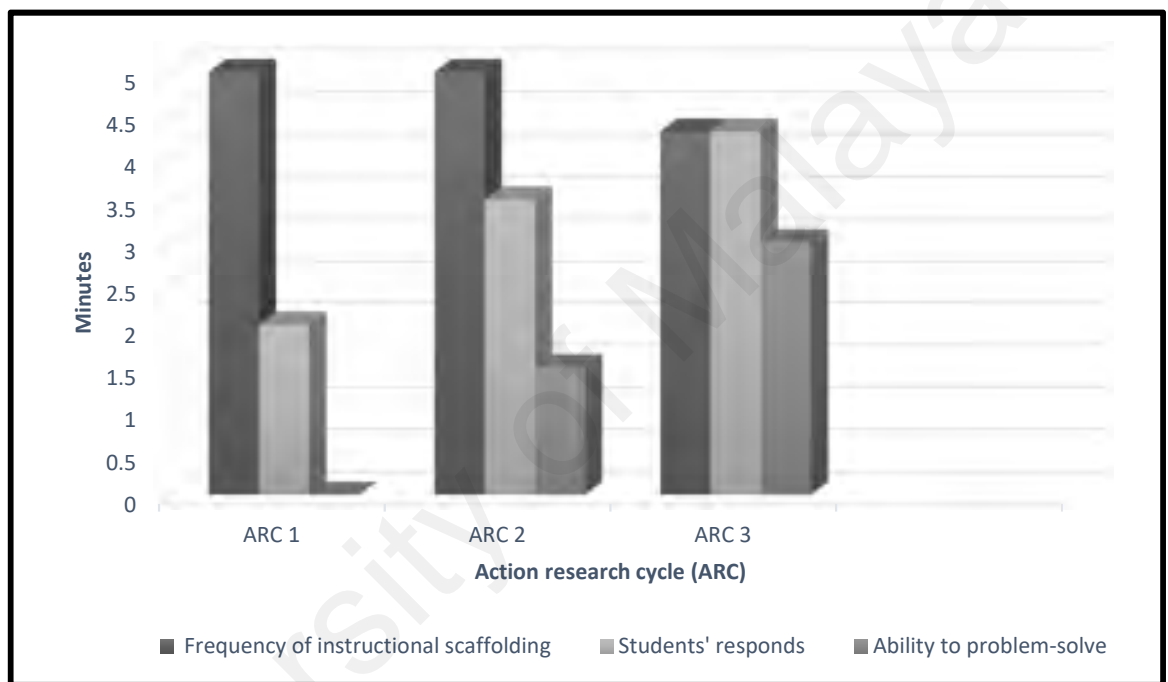
With the theory above in mind, the teacher created an environment through the instructional scaffolding process, where students' creative ideas are valued. At the same time, students were given encouragement to play out their ideas on their keyboards and eventually to perform individually in ARC3. They were also assured that there was no wrong improvisation except sometimes the patterns may not sound right but that would create another learning experience to try out for another pattern.

Active participation integrated into active skill learning were consistent in each research cycles too. It was designed to create a comfortable lesson atmosphere for the students to promote long-lasting learning while having fun.

In summary, the instructional scaffolding process helped to stimulate students to problem-solve improvisation by experiencing the musical thoughts and sound gradually. By having a hands-on, active lesson, students were able to embrace an experiential

learning towards creating and listening of their own musical ideas, thus generating the ability to problem-solve melodic improvisation.

**4.9 Summary of the frequency of instructional scaffolding to students' response and ability to problem-solve melodic improvisation in each ARC as depicted in Figure 5**



**Figure 5: Frequency of instructional scaffolding to students' response and ability to problem-solve melodic improvisation**

Instructional scaffolding was consistent in ARC1 and ARC2. New knowledge was introduced and supported by instructional scaffolding in a gradual process. Teacher's demonstrations were actively done on every new improvisational pattern. Students were encouraged to imitate the patterns through musical activities such as singing, clapping, playing on their individual keyboards. Teacher accompanied these musical activities by playing a bass accompaniment at a consistent tempo. However, in ARC3, there were no more demonstrations. Instead, there were prompts, cues and discussion on the application of new patterns for the melody.

Students' responses in ARC1 were slow and hesitant. At ARC2, the teacher slowed down the pace of the instructions and performance to support students' understanding of the improvisation skills. The students' responses improved tremendously by ARC3.

Students' ability to problem-solve melodic improvisation was not apparent in ARC1 as it was a new learning subject. The new knowledge had to be imparted through singing, clapping, imitation playing in ARC1 and ARC2. In ARC3, the students were confident to apply the new knowledge to the melody. The students were given time to play and try out their ideas on their individual keyboards. The teacher walked around the music classroom to help some students who were hesitant to play. Eventually, these shy students performed their ideas on their keyboards.

## CHAPTER 5

### DISCUSSION, IMPLICATION, AND RECOMMENDATIONS

This chapter presents a discussion of the data collection process and the findings of this study. A brief overview of the purpose and procedures of the study is introduced. The findings of the study are discussed according to the research questions. This chapter ends with the implications for the study, limitations of the study, recommendations for future research and the concluding thoughts of the study.

The research questions are:

1. How do the music students interact with and respond to the instructional scaffolding?
2. What are the scaffolding strategies or instructions used by the teacher to facilitate problem-solving skills in music improvisation?
3. How does the teacher's instructional scaffolding process enable the students in achieving the learning goals in improvisation?

#### 5.1 Overview

Effective teaching has always been an essential element for all educational purposes, particularly useful for teaching specific skills. A systematic method of instructing new material progressively, guiding students during first practice, checking for students' understanding, encouraging active and successful participation from students, and providing all students with a high level of successful learning environment has been

highly recommended by most educators. Hence, the metaphoric term, ‘scaffolding’ teaching technique was established in general education (Bruner, 1985; Wood, Bruner & Ross, 1976; Wood, Wood & Middleton, 1978) due to its relevant description of a temporary structure for construction work. In education, teachers are the scaffold, providing the temporary support to guide students for a deeper understanding in knowledge and skills which are beyond their current ability.

With the above awareness in mind, it had directed the purpose of this study to investigate the role of the instructional scaffolding strategies on teaching students to problem-solve melodic improvisation in music education. Through this study, the ‘gap’ between knowing the facts and the actual execution of the planning-teaching could strengthen for professional improvement. At the same time, the study was to highlight the systematic strategies of the instructional scaffolding process towards improvisation as well as to determine the students’ responds towards scaffolding instructions.

The basic systematic scaffolding categories that were described above were applied in the study in a slightly modified form, as appropriately as possible in a music lesson. With the intent to approach improvisation as well as to investigate the instructional scaffolding processes systematically, three ARCs were drawn up in the study. Each ARC lesson plan was guided by McNiff (2013). The progressive mental operations for learning were guided by Marzano and Kendall (2007).

ARC1 made use of level 1 (Retrieval) and level 2 (Comprehension) of the taxonomy. Level 1 (Retrieval) had three levels of cognitive system: recognizing; recalling and executing. A familiar music material (Mary had a little lamb) was introduced systematically by utilizing these three stages. As these students were novice students to music improvisation, the introduction of the 1<sup>st</sup> melodic improvisational pattern to the familiar music material were repeated notes on the 2<sup>nd</sup> beat of each bar.

Additional notes to each bar changed the rhythmic structure of each bar as well. Subsequently, the two levels of cognitive system in level 2 (Comprehension): integrating and symbolizing, were utilized in the lesson to generate the 1<sup>st</sup> melodic improvisational pattern.

ARC2 used the mental operations of level 1 (Retrieval) and level 2 (Comprehension) of the taxonomy. The difference was these mental operations were applied to a different music material (Hot cross buns). A 2<sup>nd</sup> melodic improvisational pattern which consisted of passing-notes, repeated notes with different rhythmic patterns were instructed for integration to the music material.

ARC3 used the same mental operations in level 1(Retrieval) and elevated to level 3 (Analysis). The cognitive system that was utilized in level 3 (Analysis) was matching. A new music material (Baby elephant walk) was used. There were no demonstrations in improvisation from the teacher in ARC3. Instead, there were questions, prompts and discussion communicated between teacher and students on the possibilities to problem-solve melodic improvisation for the present melody. Students were encouraged to apply the learned improvisational patterns and mix-match to suit the melody. They were also encouraged to play and explore the improvised patterns on their keyboards, to test out the sound and rhythmic patterns. Students' ability to problem-solve melodic improvisation was measured through their individual performances in this ARC 3 as well.

## **5.2 Summary of the findings in ARC1, ARC2 & ARC3**

Findings from these three research cycles united on one important fact – positive results from student's responses and performances to teaching strategies had to be generated progressively and gradually. In ARC1, new knowledge was presented to students in easy steps, guiding through demonstrations, giving clear detailed instructions and monitoring active practice. Progress was only obvious starting from ARC2 and ARC3. In this research study, it was expected that the application of instructional scaffolding would be beneficial for musical skill learning.

The connection between the instructional scaffolding and students' performances in the musical tasks was evident throughout the ARC. In this sense, students' interaction, responses and performances were dependent on the instructional scaffolding. If the instructional scaffolding was flawed, the students' behavior and performance would reflect it. The findings indicated from the students' interaction and responses were eager learners - they were willing to participate in the improvisation musical tasks and were excited to showcase their ideas. The students' confidence and performances capabilities were built on gradually as the ARC progressed.

The process of organizing each ARC was dependent on the outcome of students' responses from the previous ARC. The teacher may have planned several new improvisation musical tasks ahead but if the students could not grasp the previous learning subject, the teacher would have to repeat and review the previous musical tasks more thoroughly before moving on to new tasks. As Rosenshine, Froehlich and Fakhouri (2002) specified that reviews of previous learning are a prerequisite criterion. This would enable students' learning of new materials with more clarity. With this knowledge, it had helped the teacher to modify the research cycles to accommodate students' understanding, hence, there were positive feedbacks in the achievement of the



subject matter in the study. Guiding and demonstrating the musical tasks had added students' achievement and confidence level in the study as well.

By allowing students to explore rhythmic and melodic patterns on their own individual keyboards in class could be chaotic but it was necessary for the students to experience musical stimulation in class with the teacher presence. The teacher could immediately provide systematic feedback and corrections on the spot. There were discussions, prompts and questions communicated between teacher and students to monitor students' performances. It had correspondingly encouraged the students to play out their ideas without feeling disheartened.

Through these three ARCs, the findings indicated: (1) a systematic teaching process for developing and application is the essence for students to problem-solve melodic improvisation; (2) the instructional vocabularies and demonstrations from the teacher remains an effective teaching approach; and (3) by allowing students to explore sounds and rhythmic patterns on their keyboards in class helped to create musical stimulation through experiences and ideas.

### **5.3 Discussion of findings of the study**

The following presents the findings and discussion according to the research questions in this study.

#### **5.3.1 Research question 1**

How do music students interact with and response to the instructional scaffolding?

The music students in the study were beginner keyboard students aged 8-9 years old. They had limited musical knowledge and playing skills with no experience in improvisation. Nevertheless, they were eager to learn new musical skills. The music

materials that were chosen for the improvisation musical tasks were familiar melodies and they had no problem performing these melodies as printed in the music scores. Easy new improvisational patterns were conveyed and presented to the students.

Through video-observation on ARC1, the students were unsure with the instructional scaffolding vocabularies such as, “Sing; Listen; Play; Sing and clap; Sing and play; Look at the score and sing”. However, the teacher had managed to overcome the problem by going through the learning sequence at a slower pace.

In ARC2, it was observed that the students were more alert with their responses on the instructional scaffolding. They listened with more focus and managed to execute the improvisational patterns that were demonstrated by the teacher with accuracy to the given tempo. They were also more vocal with their thoughts on the musical tasks in ARC2

By the third week, through video-observation in ARC3, there was a change in the class dynamics. The students were attentive to the teacher’s instructions and at the same time, there were more dialogue sessions between teacher and students. The change in the students’ behavior was more confident and they were eager to showcase their ideas on improvisation.

There was a gradual improvement in the students’ interaction and responses from the ARC1 to ARC3. It was likely that a positive connection existed between students’ interaction and responses with the instructional scaffolding. Observation of the instructional scaffolding implemented in the study revealed a progressive sequence of intentional vocabularies (Marzano & Kendall, 2007) for students’ understanding and execution of the musical tasks.

The students proceeded through a series of instructional scaffolding process of musical activities and keen listening skills through interacting musical tasks. Learning through instructional scaffolding had encouraged progressive understanding in the specific musical skills for students to develop confidence gradually. Hence, by ARC3, students became more confident and verbal in their musical tasks.

### **5.3.2 Research question 2**

What are the scaffolding strategies or instructions used by the teacher to facilitate problem-solving skills in music improvisation?

By prioritizing the scaffolding theory in mind, the teacher had implemented the development of problem-solving skills gradually. New knowledge was introduced and instructed progressively with singing of the improvised melodies, clapping the new rhythmic patterns, and demonstrations of the improvised melodies (Hallam, 2006; Rosenshine et al., 2002). Directed, sequential instructions and gestures (nod of the head or hand gestures from teacher) were frequently used during lessons when the students had to perform their melodies to the tempo of the teacher's accompaniment.

As students progressed in the learning, the teacher gradually withdrew the scaffold (instructions). Questions and prompts were forwarded instead to help students think for a solution to problem-solve the improvisation tasks. Discussions between teacher and the students offered ways to improve students' thoughtful ideas for application to the melodies. Encouraging students to follow the learned systematic procedures on singing the actual melody first, then sing or hum the improvised melodies, clap the new rhythmic patterns, play through the new improvised melodies, listen and decide for the best solutions had provided musical experiences as well. At

the same time, by allowing the students to make mistakes brought out the awareness in the listening and performing skills to correct themselves immediately.

### **5.3.3 Research question 3:**

How does the teacher's instructional scaffolding process enable the students in achieving the learning goals in improvisation?

According to educational theorists (Bruner, 1996; Dewey, 1938; Rogoff, 1990; Vygotsky, 1934/1978), students should be allowed to experience and interact with the learning processes. In this way, learning should take an active role, in a progressive learning curve to construct their own understanding. Similarly, Allsup and Westerlund (2012), Hallam (2016), Sawyer (2011), Webster (2018), Wiggins (2015) reiterated that in a musical context, learning through creating, listening and performing forms the active experiential learning curve for music students.

With the theory above in mind, the teacher created an environment through the instructional scaffolding process, where students' creative ideas are valued. Every student took time to showcase their improvisation at their individual keyboard. The teacher cued them in by calling out their names and providing the accompaniment pattern for their melodic improvisation. Students were given encouragement to play out their ideas on their keyboards and eventually to perform individually. They were also assured that there was no incorrect improvisation except sometimes the patterns may not sound right but that would create another learning experience to try out for another pattern.

The instructional scaffolding process helped to stimulate students to problem-solve improvisation by experiencing the musical thoughts and sounds gradually. Keeping quiet and listening to their friends playing out the improvisation individually

had also brought out the awareness on the possibilities of various patterns. By engaging students in meaningful musical, active lessons, students were able to embrace an experiential learning towards creating and listening of their own and friends' musical ideas. At the same time, students managed to generate the ability to problem-solve improvisation gradually.

#### **5.4 Implications of the study**

The findings of the study indicated that instructional scaffolding process had revealed a pattern of systematic teaching method. Since music education has a wide scope of knowledge with a specific content and explicit skills, researchers have recommended to support learning through the systematic method as a teaching model (Hallam, 2008, 2016; Rosenshine, Froehlich & Fakhouri, 2002). Through the systematic process, the objective learning goals could be accomplished gradually.

The instructional scaffolding process not only supported students' learning, it had also reinforced the teacher to align her thoughts and training to increase the knowledge of the subject matter when preparing the lesson plans for the study. Sequential instructional goals and objectives with directed instructional verbs were easier to plan and carry out during lessons when the teacher has acquired the skills for the subject matter.

The ARCs in this study may be limited to only three cycles, but the impact it had on the teacher was powerful. In the sense that the 'gap' between the actual action of 'doing' the whole process compare to just 'knowing' the facts had indeed been a learning process for the teacher. The active participation in the scaffolding process with the students benefitted the teacher as much as the students.

The experience of planning the study had brought out the awareness of which musical activity and correct vocabulary was helpful with the planning of future lessons. It had also created a positive learning curve for the teacher that systematic teaching indeed needs planning and evaluation at each lesson. It is not a 'one size fits all' for every lesson plan. For example, if the subject matter for the lesson was too overwhelming for the teacher to teach and the students could not grasp the details, then it would be practical to spread the learning subject into a few lessons instead of just one lesson. This would setback the flow of time schedule but helping students to grasp the core foundation of the subject matter first before moving on is desirable.

Throughout this study, students responded positively during lessons. It was an indication that the instructional scaffolding process was effective at the stage of learning. However, some students could not be as skilled as the others, and the instructional scaffolding process was modified to assist these students. Supervision were given at these guided practices, instructions were repeated and encouragement for these less skilled students to have more practice. While attention was on these students, the teacher also encouraged the better students to practice on their own to gain more improvised melodic patterns. Eventually the supervision was reduced when students were confident to practice independently.

### **5.5 Limitations of the study**

There were several limitations in this study. One limitation was the limited amount of time to conduct more ARCs. It would have been more practical to conduct the study over more modified cycles to document and explore the instructional scaffolding processes with more depth. There is limited literature on the instructional scaffolding

process to facilitate students to problem-solve melodic improvisation, thus, the findings on these processes may benefit teachers who are keen to continue the exploration of the systematic methods to instruct improvisation to young students.

Another limitation of the study was the inability to generalize the findings to other group of music students of different age group. The participants for the study throughout the three-ARCs consisted of the same group of novice students aged 8-9. A comparison could be evaluated if there were more groups of music students to participate in the study.

### **5.6 Recommendations for future study**

A recommendation for future researches to conduct more ARCs to document and explore the instructional scaffolding processes with more depth. Modification of future ARCs could explore deeper in learning complexity (for teacher and students) in the mental operations of level 3 (Analysis) before progressing to the level 4 (Knowledge Utilization) of *The New Taxonomy of Educational Objectives*, Marzano and Kendall (2007) would be beneficial for creative musical tasks.

Based on the taxonomy as a guide to implement new musical tasks, it would be beneficial to determine if students could integrate their knowledge and skills to problem- solve melodic improvisation independently at a higher level. At the same time, these scaffolding processes would allow teachers to focus in detail on every aspect of the subject matter for a more creative environment.

## 5.7 Concluding thoughts

Instructional scaffolding as an effective teaching method not only beneficial to support musical skills learning but also for promoting creativity for students. The instructional scaffolding process helped to stimulate students to problem-solve improvisation by experiencing the musical thoughts and sound gradually.

By engaging students in meaningful musical, active lessons, students can embrace an experiential learning towards creating and listening of their own musical ideas in a gradual learning process. Since learning is active in a gradual process, students are not easily disheartened if mistakes are made. Instead, the experiences of making mistakes may in turn contribute awareness of clarity in improvising for a better melodic variation which may progress to independent learning. Through integration of active participation and experiential learning, students could develop musical skills learning in these environments into a long-lasting learning experience.

Words of encouragement are effective in motivating students and improving achievement as well. Students will not easily give up if they are experiencing a meaningful musical lesson – a lesson without judgmental remarks from the teacher. The teacher could be a facilitator, to encourage independent practice among the students rather than giving out instructions all the time.

The teacher who was also the researcher in the study, acknowledged the creative teaching experiences throughout the study. The instructional scaffolding allowed the teacher to develop support strategies through creative musical activities and through these activities, the teacher had to create and adapt structures accordingly to scaffold students' effective learning improvisations. Thus, scaffolding formed the opportunities for a personal gradual creative learning environment for the teacher as well.



As Erickson (2011), Kurtz (2011) and Sawyer (2004) had stated that even though it was essential to have a structural framework as a systematic progression to learning, the processes in creating the knowledge involved needed creativity and spontaneity inspiration. In this sense, the teacher had to create the teaching sequence and planned the musical tasks to foster new knowledge to the students to problem-solve musical tasks. When she was executing the act of teaching, she was correspondingly improvising the use of instructional and managing the musical activities.

Throughout the study, the teacher was expanding, modifying and developing on her personal critical thinking skills on the best approach for students' progressive learning by keeping the scaffolding theory in mind. In this sense, the teacher has improved her teaching skills and critical thinking to a higher level which involved creating positive change on a professional level.

Through the years, researchers had begun to analyze that content knowledge alone was not enough for effective teaching in the 21<sup>st</sup> century (Craft, Jeffrey & Leibling, 2001, Gardner, 2007, Sawyer, 2012b, Shuler, 2011, Webster, 2018). Music teachers are encouraged to enhance students' mode of thinking to understand music comprehensively. Thinking skills which include creative thinking, critical thinking and higher order thinking are indispensable to problem-solve for better musical decisions. Therefore, encouraging collaboration, communication and performance among students on various categories of music increases the sustaining, effective music teaching in the 21<sup>st</sup> century as well. According to Shuler (2011), teachers should empower students with higher order thinking skills to create, to perform and to respond appropriately to music. Similarly, these skills can help students transfer the cognitive process, teamwork and social skills in music learning to other learning disciplines.

From this study, it had implemented that the role of instructional scaffolding as one of the methods for effective teaching to help student's problem-solve melodic improvisation, it had also indirectly contributed the creative inspiration for the teacher's continuous professional development. The awareness to problem-solve effective teaching processes could impart and test the knowledge to generate more creative musical tasks to students and for future researches too. Lastly, as a music teacher in order to shape the future of students' achievement through music learning, cultivating explicit thinking skills could improve students' mindfulness for a deeper and progressive level of sequential musical understanding.

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## **APPENDIX A**

A1: Letter to the Assistant Headmistress requesting for permission to conduct study with the students in the school

A2: Letter to the students' parents requesting for permission to conduct study with their child in the school

University of Malaya

## APPENDIX A1:

Farah Pauline Yong Abdullah  
No 6, Jalan 14/35,  
46100 Petaling Jaya,  
Selangor Darul Ehsan.  
March 13, 2018

Puan Nur Mazlina bt. Majnum  
Penolong Kanan Kokurikulum Sekolah Kebangsaan Damansara Jaya 1,  
Jalan SS22/48, 47400 Petaling Jaya,  
Selangor Darul Ehsan

### RE: Permission to Conduct Research Study

Dear Puan Nur Mazlina,

I am writing to request permission to conduct a research study at your school. I am currently enrolled in the Performing Arts (Music) at University Malaya in Kuala Lumpur and am in the process of writing my master's Thesis. The study is entitled "The Role of Scaffolding Strategy in Facilitating Problem-Solving Skills in Music Improvisation".

I hope the school administration will allow me to conduct my study on your school's keyboard class students, in the school's music classroom. The study will take place during the students' weekly school keyboard period. The process should take no longer than 20 minutes each week, for 3 weeks.

My data collection methods will include audio and videotape recordings of the students and myself in the classroom practicing improvisation exercises on the keyboards, diary recordings, field notes and reports. The data that is collected will remain confidential and to be used on academic purposes only. No costs will be incurred by either your school or the students.

Your approval to conduct this study will be greatly appreciated. I will follow up with a telephone call next week and would be happy to answer any questions that you may have at that time. You may contact me at my email address: [paulineyong07@yahoo.com](mailto:paulineyong07@yahoo.com). My contact number is 013-3614563.

Thank you for your kind assistance.

Yours sincerely,

Farah Pauline Yong Abdullah

cc. Encik Zubir bin Yaacob, Guru Besar SK Damansara Jaya 1;  
cc. Dr. Cheong Ku Wing, Research Advisor, University Malaya.  
Approved by,

## APPENDIX A2:

21 March 2018

### **RE: Permission to conduct music research with your child**

Dear Sir/Madam,

My name is Pauline and I am writing to request permission to conduct a music research with your child. I am currently enrolled in the Performing Arts (Music) at University Malaya in Kuala Lumpur and am in the process of writing my master's Thesis.

I am conducting a piece of action research into studying how I can encourage music students to apply their musical skills to music improvisation. My data collection methods will include audio and videotape recordings of the students and myself in class, photographs, field notes and reports. I guarantee that I will observe good ethical conduct throughout the study.

I would be grateful if you would sign and return the slip below to Cikgu Mazlina at your earliest convenience. Thank you.

Yours sincerely,

Farah Pauline Yong Abdullah

Cc: Encik Zubir bin Yaacob, Guru Besar;  
Puan Nur Mazlina bt Majnun, Penolong Kanan Kokurikulum

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To Cikgu Mazlina,

I \_\_\_\_\_ (name), give my permission for \_\_\_\_\_  
(child's name) to take part in the study.

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(Parent's signature)

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(Parent's name)

## **APPENDIX B**

B1: Music material and lesson plan for action research cycle 1 (ARC1)

B2: Music material and lesson plan for action research cycle 2 (ARC2)

B3: Music material and lesson plan for action research cycle 3 (ARC3)

University of Malaya

## APPENDIX B1

Music material for action research cycle 1(ARC1)

**Mary had a little lamb**

Nursery rhyme

Piano

The image shows a piano accompaniment for the nursery rhyme 'Mary had a little lamb'. It consists of two systems of music. The first system has four measures, and the second system has three measures. The music is written in 4/4 time and uses a treble and bass clef. The melody is in the treble clef, and the bass line is in the bass clef. The notes are simple, with many rests, and the overall tempo is slow and gentle.

## Lesson plan for ARC1

Activity/Teacher	Mental Operations	Instructional Scaffolding	Students Participation
Introduction/Play melody	Level 1 Retrieval – recognizing	Do you recognize this melody?	Listen
Sing/Play melody with accompaniment	Level 1 Retrieval – recalling	Let's sing in solfege. Here is the introduction. Listen...Sing	Sing in solfege to teacher's playing
Clap/Play melody with accompaniment	Level 1 Retrieval – recalling	Let's clap the rhythm pattern. Here is the introduction. Listen...Clap	Clap the rhythm pattern to teacher's Playing
Play/Play the accompaniment	Level 1 Retrieval – executing	Let's play the melody. Here is the introduction. Listen...Play	Play the melody to teacher's Accompaniment
Improvisation/Demonstration	Level Comprehension – integrating	2 Let's improvise the melody. I will show you. Listen...  Let's keep the 1 <sup>st</sup> notes in every bar and repeat the 2 <sup>nd</sup> notes. Listen...	Listen and look at teacher's Performance
Sing/Play improvised melody	Level Comprehension – integrating	2 Imitate my singing. Listen...Sing	Sing to teacher's accompaniment
Clap/Play improvised melody	Level Comprehension – integrating	2 Imitate my clapping. Listen...Clap	Clap the new rhythm pattern
Play/Play the improvised melody	Level 1 Retrieval – executing	- We will play 2-bars first. Imitate my playing. Listen...Play	Play the improvised melody
Write/Show the extra notes in the score	Level Comprehension – symbolizing	2 We played some new notes in bars 1 & 2. Let's write in these notes.	Write in the notes


## APPENDIX B2

Music material for action research cycle 2 (ARC2)

**Hot Cross Buns**

Nursery Rhyme:

Piano



The image shows a musical score for the nursery rhyme 'Hot Cross Buns'. The score is written for piano and is in 2/4 time. It consists of two staves: a treble clef staff and a bass clef staff. The treble staff contains the melody, which is a simple sequence of eighth notes: C4, D4, E4, F4, G4, A4, B4, C5, B4, A4, G4, F4, E4, D4, C4. The bass staff contains a simple accompaniment of eighth notes: C4, C4, C4, C4, C4, C4, C4, C4, C4, C4, C4, C4, C4, C4, C4. The piece ends with a double bar line.



## Lesson plan for ARC2

Activity/Teacher	Mental Operation	Instructional Scaffolding	Students Participation
Introduction/Play melody with accompaniment	Level 1 Retrieval - recognizing	Do you recognize this melody?	Listen
Sing/Play melody with accompaniment	Level 1 Retrieval - recalling	Let's sing in solfege. Here is the introduction. Listen... Sing	Sing in solfege to teacher's Accompaniment
Clap/Play melody with accompaniment	Level 1 Retrieval - recalling	Let's clap the rhythm pattern. Here is the introduction. Listen...Clap	Clap the rhythmic pattern to teacher's playing
Play/Play accompaniment only	Level 1 Retrieval - executing	Let's play the melody. Here is the Introduction. Listen...Play	Play the melody to teacher's Accompaniment
Improvisation/Demonstration	Level 2 Comprehension – integrating	Let's improvise this melody with the pattern which we learnt last week. I will show you. Listen	Listen and look at teacher's performance
Sing/Play the improvised melody	Level 2 Comprehension – integrating	Let's sing in solfege. Here is the Introduction. Listen...Sing	Sing in solfege to teacher's accompaniment
Clap/Play the improvised melody	Level 2 Comprehension – integrating	Let's clap the rhythmic pattern. Here is the introduction. Listen...Clap	Clap to teacher's playing
Play/Play accompaniment only	Level 2 Comprehension – integrating	Let's play the improvised melody. Here is the introduction. Listen...Play	Play the improvised melody to teacher's accompaniment
Improvisation/Demonstration	Level 2 Comprehension – integrating	I will play another pattern for this melody. Listen...	Listen and look at teacher's Performance
Sing and clap/Play the improvised melody	Level 2 Comprehension – integrating	Let's sing and clap this improvised melody. Here is the introduction. Listen... sing and clap	Sing and clap the improvised melody to teacher's accompaniment
Play and sing/Play the improvised melody	Level 2 Comprehension – integrating	Let's play and sing. Here is the introduction. Listen...play, sing	Play and sing the improvised melody

APPENDIX B3

Music material action research cycle 3 (ARC3)

**Baby elephant's walk**

[Composer]

Piano

The musical score is presented on two staves. The top staff uses a treble clef and the bottom staff uses a bass clef. Both staves are in 4/4 time. The key signature is one flat (B-flat). The score is marked 'Piano'. The melody in the treble staff consists of four measures: 1) G4 quarter, A4 quarter, B4 quarter, B4 quarter; 2) A4 quarter, G4 quarter, F4 quarter, E4 quarter; 3) D4 quarter, C4 quarter, B3 quarter, B3 quarter; 4) A3 quarter, G3 quarter, F3 quarter, E3 quarter. The bass staff contains four measures of whole rests.

### Lesson plan for ARC3

Activity/Teacher	Mental Operation	Instructional Scaffolding	Students Participation
Introduction/Play the melody with accompaniment	Level 1 Retrieval – recognizing	Do you recognize this melody?	Listen
Sing/Play the melody with accompaniment	Level 1 Retrieval – recalling	Let's sing the melody in solfege. Here is the introduction. Listen... Sing	Sing to teacher's accompaniment
Clap and sing/Play the melody with accompaniment	Level 1 Retrieval – recalling	Let's clap and sing the melody. Here is the introduction. Listen...Sing	Clap and sing to teacher's accompaniment
Play and sing/Play the melody with accompaniment	Level 1 Retrieval – executing	Play and sing the melody. Here is the introduction. Listen...Play	Play and sing to teacher's Accompaniment
Problem-solving/Prompting – walking around the class – help students	Level 2 Comprehension – Integrating	Let's figure out how we should improvise bar 1. Based on the previous exercises, what can be changed on 1 <sup>st</sup> & 2 <sup>nd</sup> notes?  Let's try out on your keyboards...	Play and experiment with the improvised melody for bar 1
Problem-solving/Prompting – Walking around the class	Level 3 Analysis – matching	Now try the same pattern for bar 2. Keep the 1 <sup>st</sup> note in bar 2, but play the same pattern as in bar 1  Let's try out on your keyboards...	Play and experiment with the sound and patterns
Problem-solving/Prompting	Level 3 Analysis – matching	Let's try out bar 3 now...  How about bar 4? Let's try it out...	Play and experiment with the sound and pattern
Showcase/Play the accompaniment pattern	Level 1 Retrieval - executing	Let's play the whole improvisation to teacher's accompaniment.  Reese, you shall play first, then I will play a bridge and link in Kim. After Kim, I will play the bridge again and link in Adam and so on. Everyone gets a turn to play.  Reese, here is the introduction. Listen...play	Everyone gets to play their improvisation. Waiting for their turn, listening and be alert.

## APPENDIX C

Improvised materials from students' ability to problem-solve melodic improvisation in action research cycle 3 (ARC3)

### Student A

**Baby Elephant Walk**

[Composer]

Piano


The musical score for 'Baby Elephant Walk' is presented in a single system. It features a treble clef staff with a common time signature (C) and a bass clef staff. The melody in the treble staff is a simple, repetitive sequence of notes: C4, D4, E4, F4, G4, A4, B4, C5, followed by a quarter rest. This sequence is repeated four times across the four measures. The bass staff contains whole rests in all four measures. The piece ends with a double bar line.

Student B

Baby Elephant Walk

[Composer]

Piano




Student C

Baby Elephant Walk

[Composer]

Piano




**Student D**

**Baby Elephant Walk**

[Composer]

Piano




**Student E**

**Baby Elephant Walk**

[Composer]

Piano



Student F

**Baby Elephant Walk**

[Composer]

Piano

The image shows a musical score for a piece titled "Baby Elephant Walk". The score is written for piano and consists of two staves: a treble clef staff and a bass clef staff. The time signature is common time (C). The melody in the treble staff is composed of quarter notes and eighth notes, with a final quarter rest in each measure. The bass staff contains whole rests in all four measures. The word "Piano" is written to the left of the first measure. The score is enclosed in a rectangular box.