CHAPTER 1

INTRODUCTION

Over the past two decades, technological development has changed so rapidly that it is difficult for the average person to keep up with all the changes. Globalisation, liberalisation, and internationalisation have placed the body of knowledge in a state of constant flux. As Malaysia enters into the second phase of 15 years to achieve Vision 2020, the responsibility of the Ministry of Education and educators in the development of human capital is greater. Curriculum planners and educators in Malaysia are updating and improving the education system. The Ministry of Education has launched a comprehensive review of the education system in Malaysia recently. A preliminary blueprint named Malaysia Education Blueprint 2013-2025 is developed with the vision that every student will have knowledge, thinking skills, leadership skills, bilingual proficiency, ethics and spirituality, and national identity (Ministry of Education Malaysia, September, 2012). These aspirations which align with the National Education Philosophy are critical in preparing students to succeed and thrive in an increasingly globalised world.

Thinking skills is one of the aspirations of the Malaysian education system stated in the Malaysia Education Blueprint 2013-2025. It is hoped that all students possess the spirit of inquiry and the skills to learn how to continue acquiring knowledge throughout their lives. Every student is hoped to be able to master cognitive skills such as creative thinking and innovation, problem-solving and reasoning, and learning capacity. Every student will have the ability to innovate, to generate new possibilities, and to create new ideas or knowledge. With that, the aim of the education system to develop human capital that has first class mentality, self-complete, and has the ability to think creatively and critically to face the challenges of this global and dynamic world is realized. To achieve the vision of the Malaysia Education Blueprint 2013-2025, the role of teachers, lecturers, and educators are put to test and it is hoped that the education system can develop first class students and the future generation of Malaysia that can compete with other nations in the area of commerce, enterprise, creativity, and innovation.

Psychologists and educators have noted creativity as an important component in human development. Everyone can be creative, possess creativity, and everyone have creative problem solving abilities to some extent according to Runco (2007b). Without creativity, mankind cannot progress (Csikszentmihalyi, 1996). Torrance (1962), a well-known name in the field of creativity, states that through creativity children can express their own ideas and emotions that improve mental health. Children will become fully functioning persons when their mental abilities develop. When children ask questions, begin to inquire, have the desire to experiment, and manipulate, or play with ideas and materials, they are learning and thinking creatively. Children should not learn from recognising and memorising for this method of learning will only lead to passive learning. Einstein back in 1929 has stated that "Imagination is more important than knowledge" (Allam, 2008, p. 281).

The Teacher Education Institution in Malaysia produces teachers for the primary schools. The goal of the Teacher Education Institution and any other institution in the world is to produce good teachers for the future. A good teacher is a teacher that can combine musical artistry with the artistry of teaching. According to Brinkman (2010), the glue that holds the musical artistry and the artistry of teaching is creativity. A creative teacher is a teacher that is curious, tolerant of ambiguity, willing to surmount obstacles, willing to grow, intrinsically motivated, and willing to take moderate risks, and they have a desire and the ability to work for recognition (Sternberg, 1988).

Brinkman (2010) further substantiate that a creative teacher is a teacher that can inspire his or her student. A creative teacher motivates and develops his or her students. A creative teacher can recognize and understand the problems faced by the students. Brinkman (2010) stressed that teachers at all levels should be encouraged to teach creatively and teach for creativity. This is because education requires creativity (Charyton, Ivcevic, Plucker, & Kaufman, 2009). Hence, music educators in teacher education institutions should prepare trainee teachers for their future profession by emphasizing creativity in thinking and problem solving.

1.1 Background of the Study

In Malaysia, teacher education institutions are given the role to produce quality music major teachers as educators to the future generation in the primary schools for about thirty years. Recently, in July 2005, the teacher education institutions were upgraded from the teacher training college. This is to achieve the vision of the National Education Philosophy that is to produce teachers, who are excellent in teaching and learning (Ministry of Education Malaysia, May, 2011c). The advancement from certifying diploma certificates to bachelor of teaching degrees is hoped that teacher education institutions are able to realize the needs of the 21st century education demand, and compete with other institution of higher learning (Ministry of Education Malaysia, Feb, 2011b).

Teachers in the primary schools are trained by 27 teacher education institutions throughout the whole Malaysia. The music education program existed in some of these institutions either as a major music course, a minor music, or elective music course. The syllabuses used are similar throughout all the twenty seven institutions. Teacher education institutions have since moved forward and begin to educate pre-service teachers towards acquiring the degree of teaching in primary schools through the

Bachelor of Teaching in Music Education for Primary Schools program. The main objective of the bachelor program is to produce music teachers that are competent to teach general music in the primary schools.

One of the learning outcomes stated in the guide book of the Bachelor of Teaching in Music Education for Primary Schools program is to use inquiry and problem solving processes in learning through higher order and critical thinking (Ministry of Education Malaysia, 2006b). It is hoped that with the transformation stated in the New *Institut Pendidikan Guru* blueprint (Ministry of Education Malaysia, May, 2011c), the vision of transforming teacher education institutions into *Learner-Centered University* can be achieved. In order to achieve that, the curriculum was improved by emphasizing various approaches in teaching in order to be able to produce knowledgeable and competent music teachers, who are capable of achieving a high level of personal well-being as stated in the National Education Philosophy.

However, the emphasis stressed by the Bachelor of Teaching in Music Education for Primary Schools program seems to incline towards an applied music and pedagogy of music education. The music education program seems to lack in the creativity and innovation area that can spruce trainee teachers to be creative thinkers. Examination-oriented and knowledge centered seems to be the prominence. However, lateral thinking and problem solving skills are strongly highlighted in the course work of the trainee teachers.

Though creative thinking is not imported directly as a subject, it intrinsically absorbs in some of the courses offered in this program. Activities such as learning how to compose short pieces, and part writing of melodies for ensemble playing were introduced to trainee teachers are part of their course work in the Composition and Ensemble course. This course has two parts, Composition and Ensemble I and Composition and Ensemble II, introduced in semester four (year 2) and semester six (year 3). Composition, besides being a product of creative thinking, is in itself a way to creatively thinking (Webster, 2002).

Music education is about communication, creativity and cooperation (Jones, 2008). By studying music in school, students build on these skills, enriching their lives and experiencing the world from a new perspective. Every child in every primary school should have access to an effective music education. Music education is an integral part of developing a society that is literate, creative, and imaginative. The Integrated Curriculum for the Primary School syllabus in Malaysia for the primary education was published in 1995 and has been revised in line with the aspirations of the National Education Philosophy (Ministry of Education, 1995). The aim of the revision is to develop Malaysians to face the present educational challenges in view of the rapid advancement of globalization. It is hoped that by the continuous opportunity for education, the desire and aspiration of the country can be achieved and a holistic and potential individual can be developed.

The content of the music education syllabus in the Integrated Curriculum for the Primary Schools has been arranged according to the following four aspects, which are aesthetic perception, musical experience, creative experience, and aesthetic value (Ministry of Education, 1995). Under the creative experience aspect, children are taught to express their thoughts and creativity through exploration, improvisation and create compositions based on sound. The content of this aspect focuses on improvisation of melodies and rhythmic patterns. It is hoped that the musical activities of improvisation as well as understanding the concepts of music will enhance the development of creativity in students hence generate interactively creative thinkers.

In 2010, the Integrated Curriculum for the Primary School syllabus was revised and Standard Curriculum for the Primary Schools emerged. Standard Curriculum for the Primary Schools is formulated and implemented phase by phase starting from the year 2011. The new curriculum emphasises holistic development of the students which encompasses new elements such as grooming of creativity and innovation, entrepreneurship, and integration of Information and Communication Technology. The ability to think creatively and critically together with the ability to innovate is built from six pillars that are communication, physical and aesthetic development, humanism, science and technology, spirituality, attitude and values, and self-competence (Ministry of Education Malaysia, 2011a).

To be able to teach creatively, trainee teachers need to have the knowledge and skill to generate a suitable environment that enhances creativity. Every music teacher and music educators should have the ability to plan lessons that enhance creativity so that students have the opportunity to develop their creative thinking skills. Research data have stated that the environment where the students are in plays an important part in enhancing creativity (Bang, 1992; Chia, 1998; Csikszentmihalyi, 1990, 1996; Palaniappan, 2005). Teacher's knowledge and thinking skills will guide and shape the decisions students make and the actions they take in the classroom, which in turn have an impact on students' creative thinking skills. Sadly, the Malaysian education scene can be described as generally lacking in emphasis on encouraging students to be creative (Yong, 1994). The implementation of Standard Curriculum for the Primary Schools has neglected the field that can enhance the development of creativity most that is music (Leibowitz, 1978; Squeglia, 1994; Simpson, 1969; Wolff, 1979). The hours of interaction of music education in the primary school in the public school starting from year 2010 has been shortened from two times a week to only once a week.

Bangs (1992) in his study recommended that organizations in government, industry, and education to improve their positions on creativity and provide an atmosphere that is conducive to creative production. This is because creative potential should be recognized, nurtured, and developed to its fullest. The future of our civilisation depends upon the quality of the creative imagination of our next generation (Torrance, 1962). Therefore, teachers play a very vital role, to mould, enhance, and lastly form a creative and innovative thinker of the next generation.

Lessons learnt from creativity research should be applied into a more comprehensive teacher-training program in the aspects of creativity that may then lead to a greater development of the creative potential of students (Bangs, 1992). Programs and activities in the teacher training institutions especially for music education should provide more strategies and activities to enhance trainee teachers to be creative thinkers. The Teacher Education Institutions in Malaysia should guide their graduates towards higher order thinking in order to sustain innovation and remain competitive. The ability to be creative is identified by many as the passport to a successful future (Allam, 2008). Creativity influences self-esteem, social development, behaviour, and problem-solving abilities, thus finding ways to promote creativity becomes necessary (Farella, 2010).

Teachers' characteristics and behaviours play an important role in promoting the social and cognitive development of children. These characteristics and behaviours may also influence children's creative development. The attitude of a teacher that belief and value creativity is the key attitude needed to increase the likelihood that creativity will happen (Reid & Petcocz, 2004). Hence, professional training and teaching practices need to change the beliefs of the future teachers in order to encourage creative and innovative thinking abilities. Activities that enhanced musical creativity such as improvisation and composition, analysis should be encouraged in the classroom. Unfortunately, in-service teachers reported that the weakest components in their training are improvisation, composition, and singing (Brophy, 2002).

Children need to express their thinking and feelings. One way to fulfil these needs is through creative activities where children can express their own ideas and emotions (Torrance, 1962). It is vital that public education such as music education help children to develop a positive view of themselves. Producing such human capital is the primary goal of education as stated in the National Philosophy of Education Malaysia. Emphases on creativity in education provide children the opportunity to express their feelings and emotions, and may attain the vision of the National Philosophy of Education. Hence, teacher education institutions need to prepare future music teachers that are able to face these challenges.

Creative thinking in the music classroom can take place in many forms. There are many creative activities in the classroom such as arranging, choreographing, improvising, and composing. Students may even invent their own notation or create simple melodies to form a great composition. Children who engage in creative thinking activities possess a higher level of musical achievement (Swanwick & Franca, 1999), and demonstrate increased levels of motivation (Csikszentmihalyi, 1996). These activities require both convergent and divergent thinking (Webster, 1990b). Creative thinking occurs when one combines both the convergent and divergent thinking processes (Csikszentmihalyi, 1996; Webster, 1990b). These thinking processes should be fortified in the teaching and learning of music and cultivated within the education curriculum in order to develop creative thinkers.

Music has unique qualities and it should have a place in all children's curriculum (Longoria, 2005). To deny it a place would be a terrible mistake. Music contributes positively to the development of literacy, numeracy, concentration, creativity, general intelligence, positive self-image, social skills, emotions and physical health (Longoria, 2005). Russ (1993) reviewed empirical research on creativity and its effectiveness. Russ concluded that creativity is related to positive affect. According to Squelia (1994), creative function can be systematically developed over a period by allowing participation in creative activities. Harvey as cited in Squelia (1994) stated that creativity is not something that can be taught directly. The environment plays an important role in the formation of a creative educator (Csikszentmihalyi, 1996). The right tool has to be provided so that future teachers may grow both personally and musically to become a creative educator in the future.

Hence, it is time for the teacher education institution to move forward towards improving their teaching method and strategies by encouraging creative activities. Activities such as improvisation and composition not only will improve students musically but it can generate creative thinking skills generally.

1.2 Statements of the Problem

The studies on creativity and musical creativity have received considerable emphasis since Guilford addressed the appalling neglect of studies in creativity by psychologists in the 50s (Webster, 2002; Palaniappan, 2005; Yong, 1994). Guilford had made the initial impetus and since then studies on many different aspects of creativity flourished till today. Research on describing the peculiar characteristic of famous creative people, living or dead, became the most common sort of creative research in 1950 (Amabile, 1977) and the interest in a systematic study of creative behaviour has risen markedly since (Webster, 2002). Previous to that, less than 0.2% of the studies included in the Psychological Abstracts were indexed under the creativity heading according to Guilford (cited in Baltzer, 1988; Palaniappan, 2005). In 1969, Baron (cited in Baltzer, 1988), noted that the number of empirical studies of creativity as a general topic has increased exponentially. However, after half a century, music literature related to creativity development is still limited (Kiehn, 2003).

An in depth search on the database and search engines such as Eric, Jstor digital library, google search and also the thesis and dissertation search engine from various universities in and out of Malaysia, found that there are numerous studies conducted in the west on creativity (e.g. Amabile, 1996; Auh, 1995; Baek, 2009; Brinkman, 2010;

Charyton, 2005; Daignault, 1996; Gomes, 2005; Hlasny, 2008; Kiehn, 2000; Laycock, 1992; Levi, 1991; Menard, 2009; Niu, 2003; Russo, 2004; Son, 2009; Squeglia, 1994: Vaughan, & Myers, 1971; Webster, 1979; Wolff, 1979). Regrettably, little research was found on creativity in the local context. (e.g. Chia, 1998; Gan, 1998; Palaniappan, 1994; Singh, 2011; Siti Rafiah, 2008; Yong, 1986). Hence it can be concluded that there is a need to address the lack of creativity studies in order to reduce the gap in the literature of creativity in the Malaysian context.

Studies concerning creativity in Malaysia were mostly conducted on students in the secondary schools. Yong (1986) conducted a creativity study on Form Four students. He investigated the nature of creativity abilities of these students and its relationship with cognitive level, IQ level, cognitive style of learning, and social economic status. Palaniappan (1994) conducted a creativity study on Form Four students too. He investigated the relationship between creativity and academic achievement. Another study on form four students was conducted by Singh (2011). Similar to Palaniappan, Singh investigated the relationship between figural creativity and academic achievement.

Other than creativity studies on Malaysia form four students, there were some studies conducted on primary school pupils. Siti Rafiah (2008) made a dimension study on the Torrance Test of Creative Thinking Figural and Verbal tests on standard five primary school students. She investigated the nature of creativity on the four aspects of person, process, product, and press. See (1994) also conducted a study on primary school students. See studied the effectiveness of creative teaching in mathematics in primary school. However, her study was carried out on pupils from a Singapore primary school.

Studies concerning creativity were also conducted to university graduates and college trainee teachers. Chia (1998) conducted a study on the effectiveness of creative problem solving toward creativity of teacher trainees in Malaysia. Besides that, Gan (1998) conducted a creativity and creative perception study on female university students. However, most of the above studies are concerning general creativity and the samples of the study are mostly students in the secondary schools. In view of this, and to address the gap in the literature, more studies are needed to look into the creative nature of trainee teachers in a teacher education institution. These trainee teachers are individually selected from a pool of applications and they are the teachers of the future generation.

A thorough search in the literature shows while there are active researches concerning musical creativity in the west, there is a lack of study carried out to investigate musical creativity in Malaysia. In addition to that, studies concerning the relationships of musical creativity and musical exposures, and musical creativity and personal variables are also lacking. Furthermore, Yong (1994) has stated in his study that “In Malaysia, relatively little has been done to investigate the creative ability of the pupils” (p. 22). Thus, this study is pertinent to address this lack of empirical concern in the Malaysian context and to extend such research for the growth of indigenous musical creativity literature.

The literature concerning creativity needs to be updated and followed up. This is because creativity is developmental (Kozbelt, Beghetto & Runco, 2010) and it can be influenced by the social system (Csikszentmihalyi, 1996; Puccio, & Cabra, 2010). The interactions of human being in the dynamic ever changing society, group settings, and cultural values influence their creative abilities. The social and cultural context in which the person operates need to be taken into account (Csikszentmihalyi, 1990; Ng, 2001).

The interest in the studies of musical creativity started from the west and one of the early studies on musical creativity is by Webster (1977). Webster (1977) studied the best predictor of musical creativity and he found that the single best predictor of musical creativity is musical achievement. More than ten years after that, Laycock (1992) investigated the relationship of musical problem solving abilities of high school students with musical experience, musical aptitude, self-concept, age, and academic achievement. A few years after that, Auh (1995) studied musical creativity and she found that the best predictor for musical creativity is informal musical experiences. These findings on musical creativity may not apply to the creativity condition now considering the dynamic change in the social system. The social system has progressed towards a more advanced high technological society which probably influences the creative abilities. Hence, studies on creativity need to be updated.

Nevertheless, studies on creativity carried out in the 2000s cannot be compared to research done in 1990s, let alone research done in the 1960s. Many research attentions have been directed to musical creativity before the year 2000. Those researches conducted are outdated (Sternberg, 1999) and more recent research is needed. The present study was intended to make a contribution towards filling this gap in the literature concerning musical creativity in Malaysia.

Research on the relationship between creativity and variables such as gender, academic years, musical activities involvement, socioeconomic status, and ethnicity have produced mixed results. Gender was one of the personal variables that have an arguable finding. Some studies found that male subjects are more creative than female subjects (Kiehn, 2000; Singh, 2011; Yong, 1993). However, some other studies concerning this matter found opposite results (Baltzer, 1988; Charyton, 2005; Webster, 1979). There are also a few studies that found no significant difference between creativity and gender (Auh, 2001; Swanner, 1985; Webster, 1979, 1987). In the local context, Yong found that gender is the best and only predictor of figural creativity. The inconsistent findings on the relationship between creativity and gender warrant further research. Instruments used to measure creativity need to be re-examined in order to avoid bias to any gender (Schmidt & Sinor, 1986).

Farella (2010) recommended that more research is needed to confirm the relationships between social interactions with creative development. External influence on the environment will tend to increase or decrease the creative function of a person (Harrington, 1990). The increase or decrease of creativity depends on whether the person responds positively or negatively to the request. There are quite a number of studies on external influence such as musical experience and the influence of parents' socioeconomic status with creativity. Some studies show a positive relationship between musical experiences with creativity. For example, the study by Auh (1995) found that informal musical experiences are the best predictor of musical creativity. Laycock (1992) found that the musical experience is strongly related to the musical characteristics of the subjects' composition. However, musical experience is not a predictor in Laycock's study.

Other than the influence of musical experiences, the socioeconomic status of the subjects' family may play a significant role in shaping his or her creative development due to the advantages and disadvantages of the surroundings. Furthermore, studies investigating the influences of the socioeconomic status of parents toward creativity have found that subjects from high socioeconomic status background have a significant higher level of originality (Gan, 1998, Niu, 2003). However, some studies found that socioeconomic status does not influence creativity (Webster, 1979; Yong, 1994). It appears that the evidence regarding the effect of musical experiences and socioeconomic status of a family on the subjects' creative achievement is not definitive.

Creativity has been recognised by some researchers as culture-specific (Cskiszentmihalyi, 1996; Sternberg, 1999). In other words, the environment and social interaction differ for different people from different culture. For example, the Malay culture and the Chinese culture differ in language, eating habits, style of dressing, and religion that highly influence their way of life. For this reason, it is necessary to study creativity using diverse populations. Furthermore, according to Paletz and Peng (2008), cross-cultural research should be used to understand the nature of creativity. This could provide a more holistic picture of the nature of creativity of the people in Malaysia. Unfortunately most of the theories of creativity literature were formulated based on Western context; it would be interesting to investigate the cultural variation of creativity in the local context.

The studies of musical creativity and musical achievement (aural discrimination skills) are still in its infancy (Baltzer, 1988). Though there are numeral studies concerning musical achievement and musical creativity in the west (Gorder, 1980; Roderick, 1965; Schmidt & Sinor, 1986; Simpson, 1969; Vaughan & Myers, 1971; Webster, 1987), regrettably few studies were carried out in Malaysia. In addition, results from these studies are not consistent. For example, Webster (1977) and Vaughan (1977) both found that the best predictor for musical creativity is musical achievement, but Gorder (1980) found otherwise. The findings by Webster, Vaughan, and Gorder could be outdated. A more recent study was conducted by Auh (1995) and Auh stated that informal musical experience is the best predictor of musical creativity. As such, this study would like to address this gap in the literature.

Self-esteem of musical ability refers to the personal estimation of an individual towards his or her capacity to perform music tasks and attain musical competence (Schmitt, 1979). Self-esteem of a student should be of concern to music educators because self-esteem functions as a stimulating or limiting factor in the motivation towards achievement. Self-esteem is an important factor in the learning process and plays a dominant role in the motivation theory (Asmus & Harrison, 1990). Students who feel good about themselves and are reasonably confident of success tend to achieve more than those who view themselves negatively said Schmitt (1979). Laycock (1992) found that musical self-esteem was the best significant factor related to compositional ability of high school students among the variables of musical experiences, musical aptitude, academic grades, and age. However, Auh (1995) found that musical self-esteem is positively related to formal musical experiences but it has no significant relationship to compositional creativity, contrary to Laycock's findings. In the local context, Yong (1993) found that self-concept has a low but significant relationship with general creativity; however, it is not a significant predictor. These inconsistent findings warrant for further research on self-esteem and creativity.

The development of creativity differs from the development of cognitive abilities and other aspects of human growth (Torrance, 1962). Studies have shown that in the development of children's creativity, a plateau exists (Brophy, 2002; Kratus, 1994; Kiehn, 2000) where children repress their creative needs and abandon their creative abilities. This plateau occurs in some children during the kindergarten period, and some at the end of third grade or the beginning of the fourth grade. The next period of decline is around junior high school and the end of high school period (Torrance, 1962). Some of these children recover from the repression period due to favourably influence and some "apparently sacrifice their creativity" stated Torrance (1962). Factors that probably influence the repression of creativity are lack of self-concept, self-confidence, and behavioural problem. There are many studies involving creativity focused on children from kindergarten to the secondary level. However, there is a lack of studies on pre-service trainee teachers focussing on musical creativity.

In reviewing the literature, the following studies were found and are categorised according to the student's age. Studies that looked into the creativity of children of kindergarten were Baek (2009), Daugherty & White (2008), and Vold (1986). Studies that investigated the creativity of children of the 1st grade were Boehm (1999) and Ruokonen and Vikat (2005). Studies that looked into children of 2nd grade were Baltzer (1988), Kiehn (2000), Ruokonen and Vikat (2005), Schmidt and Sinor (1986), and Struthers (2008); while those studies that look into children of 3rd grade were Swanner (1985) and Hlasny (2008). Studies on children in 4th grade were Khien (2000), Hickey (2001), Hlasny (2008) and Vaughan and Myers (1971), 5th grade were Auh (1995), Hickey (2001), Hlasny (2008), Russo (2004), Squeglia (1994) and Vaughan (1971), 6th grade were Auh (1995), Burnard (2000), DeLorenzo (1989), Gibson (1988), Hlasny (2008) and Russo (2004), and 7th grade were Gibson (1988). Rutland and Barlex (2006) conducted studies on creativity of students from 11-14 years of age and Laycock (1992), Palaniapan (2005), Yong (1986) and Webster (1977, 1979) looked at high school students aged 15 to 18. Amabile (1977), Madura (1996), Priest (2001), Schmidt, Zdzinski & Ballard (2006), and Woodward (2006) conducted studies on creativity to university students. Though not many, there are also some studies on creativity of college students conducted by Charyton (2005) and Chia (1998). However, most of the studies above focussed on general creativity. Not many were conducted to measure musical creativity. In other words, no attempts were made to investigate trainee teachers' musical creativity.

The understanding of how music and creativity can bring about improvement in education is needed because there is a tendency for music studies in primary school to be neglected. Since the implementation of the Standard Curriculum for the Primary Schools, the interaction hours of music studies has been shortened from an hour a week to 30 minutes a week. This 50% reduction of interaction hours means students in the primary schools will be learning less of music by half. This is partly because Music Studies are not included in the Primary School Achievement Examination (*Ujian Pencapaian Sekolah Rendah, UPSR*).

Improving and supporting creative education where application of creative ideas in all forms will allow the younger generation to compete in the global market (Rowan, 2003). To remain competitive in the world of knowledge, it is necessary to work together as a team to solve problems by thinking critically, creatively and flexibly. It is vital to update and improve the country's educational system in order to prepare students to meet the challenges ahead. Changes such as classroom teaching strategies where students are taught to improvise, to explore, and to create should be incorporated. Less time should be spent on rote learning. It is time the education system in Malaysia moves away from rote learning as suggested in a study conducted by Yong (1994). This is because strategies such as teacher centered teaching, and individuals work no longer reflects life in the real world.

The inconsistent results discussed above suggest that there is a need for more research to investigate the relationship between musical creativity and general creativity with personal variables and musical exposures such as keyboard grades, musical activity involvement, aural discrimination skills, and self-esteem of musical ability.

The rationale for carrying out this study lies in the answer to these speculations: How creative are the music major trainee teachers in the teacher education institutions in Malaysia, in terms of musical creativity and general creativity? What are the musical exposures that influence the creativity of the trainee teachers? What are the predictors among the variables in musical exposures that predict musical creativity and general creativity of the trainee teachers?

Hence, the purpose of this study, first, is to investigate musical exposures, musical creativity, and general creativity among the Malaysian music major trainee teachers in the teacher training institutions. Each component in the musical creativity and the general creativity are intensely examined. In addition, the study would like to determine whether relationships exist between the musical creativity and the general creativity of the trainee teachers. Second, this study investigates the relationships between musical exposures and personal variables such as gender, ethnicity, academic year, and socioeconomic status. Following that, the study also investigates the relationships between creativity and personal variables. Third, the relationships between musical exposures and creativity are investigated. Last, the study aims at identifying the predictors of musical creativity and general creativity.

1.3 Objectives of the Study

This study aims to examine the musical exposures of the trainee teachers in the teacher education institutions. It also aims to examine the level of creativity in terms of musical creativity and general creativity. Subsequently, this study intends to ascertain the relationships between musical exposures and creativity.

Based on the speculations in the statement of the problems, this study is conducted to investigate the following six objectives:

1. To identify the musical exposures of the trainee teachers in terms of keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability.
2. To examine the relationships between musical exposures and personal variables among the trainee teachers.
3. To examine the creativity of the trainee teachers in terms of musical creativity and general creativity.

4. To examine the relationships between personal variables and creativity among the trainee teachers.
5. To examine the relationships between creativity and musical exposures among the trainee teachers.
6. To identify the predictors of creativity among the musical exposures of the trainee teachers.

1.4 Research Questions

Arising from the objectives in the study, twelve research questions are needed to be answered.

1. What are the musical exposures of the trainee teachers in the aspects of keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability?
2. Are there any significant relationships between keyboard grades and personal variables among the trainee teachers?
3. Are there any significant relationships between the levels of involvement in musical activities and personal variables among the trainee teachers?
4. Are there any significant relationships between aural discrimination and personal variables among the trainee teachers?
5. Are there any significant relationships between self-esteem of musical ability and personal variables among the trainee teachers?
6. What is the creativity of the trainee teachers in the aspects of musical creativity and general creativity?
7. What are the relationships between musical creativity and general creativity among the trainee teachers?

8. Are there any significant relationships between musical creativity and personal variables among the trainee teachers?

9. Are there any significant relationships between general creativity and personal variables among the trainee teachers?

10. Are there significant relationships between musical creativity and musical exposures among the trainee teachers?

11. Are there significant relationships between general creativity and musical exposures among the trainee teachers?

12. What are the predictors of musical creativity and general creativity among the musical exposures?

1.5 Significance of the Study

The results of this study may provide an insight to curriculum designers and the Ministry of Education about the importance of enhancing musical creativity and general creativity to future teachers. Such knowledge would be beneficial to curriculum planners who can use this information to formulate a policy and plan the framework of education towards the vision of the country. The findings of this study will be a good guide of how musical creativity and general creativity are related to musical exposures and personal variables.

This study is an attempt to extend understanding of a relatively new field in the local context. Findings from this study are expected to forecast the correlation and predictors of musical creativity and general creativity. This study will help to provide music educators as well as music teachers with some insight of what and where musical creativity and general creativity are about. It will also provide knowledge on how musical creative activities can be developed and implemented through the results of the relationship of creativity and musical exposures. The findings of this study can act as a guide to teacher education administrators, and teacher educators in teacher education institution in planning the future curriculum for their students. This study will provide teacher education administrators with an awareness of the needs to train creative trainee teachers. For example, the need to provide educators with the knowledge about the importance of musical creativity, the need to allocate funding for on-going training, and the need to provide training on the different types of creative activities. A strong support by the administrator could bring great changes to how music is being taught, particularly in relation to enhancing musical creativity and general creativity.

Since creativity research in Malaysia is still in its infancy, this study intends to investigate the nature of trainee teachers' musical creativity. Very few investigations have undertaken to study creativity. Of these, one has investigated the creative abilities of trainee teachers (Chia, 1998). However, there is a lack of literature concerning musical creativity among Malaysian music major trainee teachers. This study will examine the relationship of creativity and personal variables such as gender, ethnicity, academic year, and socioeconomic status. This study will also ascertain the musical exposures and its relationship with personal variables. The relationship between creativity and musical exposures such as keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability that has not been investigated before in Malaysia will be looked into. In addition, the best predictor for musical creativity and general creativity in the Malaysian educational environment will be identified in this study. Findings from these investigations may be valuable to music educators, lecturers in teacher education institutions, curriculum planners, and administrators as the findings have serious implications for future curriculum development, and selection of trainee teachers in music education into the teacher education institutions.

This study re-examines the inconsistent findings of previous studies. It sought to ascertain whether, for example, musical experiences or musical achievement is the best predictors of musical creativity as found in the studies by Auh (1995) and Webster (1977). This study also intends to investigate the relationship between musical creativity, general creativity, and factors that may influence trainee teachers' creativity.

It is hoped that the results of this study would be able to suggest some implications for teaching and research. The best predictor in this study would encourage music teachers to redesign their approaches in teaching and learning. The findings of this study can offer feedback to both music educators and trainee teachers. For example, if the best predictor of musical creativity is aural discrimination skills, music educators in a teacher education institution should encourage trainee teachers to improve in their listening and perception towards pitch, interval, chords, and rhythm. Strengthening ones musical abilities might enhance creativity. According to Struther (2008), achievements and creativity ability of a student rely on his or her teacher. It is the teacher's responsibility to develop and structure lessons to stimulate creativity growth.

This study will show that measuring creativity in higher education is beneficial in many aspects. The assessments of musical creativity and general creativity will diagnose the state of creativity of the trainee teachers in the teacher education institutions. It will answer the question whether music trainee teachers who are future music teachers have creative abilities. The strengths and weaknesses of the creative components of the trainee teachers revealed in this study can assist curriculum planners on areas that need improvement. Hence, the findings will help educators better understand who the trainee teachers with the creative potential are and who those in need of assistance are. The findings of this study will also offer information about how changes can be made to the classroom environment to facilitate creativity.

In summary, information gathered from this study may benefit the curriculum planners in the teacher education institution Malaysia, music educators, lecturers, teachers, and also the trainee teachers themselves in numerous ways. The findings can be utilised by educators in searching for the right musical exposures to enhance creativity abilities for the teaching and learning purposes. A supportive environment is capable of producing creative future music teachers (Runco, 2007b).

1.6 Limitations of the Study

This study was carried out in seven teacher education institutions to 159 trainee teachers of music major Bachelor of Teaching in Music Education in Primary Education program. Hence, this study faced the following limitations.

The sample of this study consisted of only music major trainee teachers of the Bachelor of Teaching in Music Education for Primary Education program in the teacher education institution in Malaysia. The findings of this study cannot be generalised to other trainee teachers of other programs, and other institutions of higher learning.

The study dealt with pre-service trainee teachers who attend music major training. It is not clear how the results of this study would generalise to older learners in the in-service courses or younger learners in the primary, and secondary schools. Their environment of learning and social interaction may be considerably different.

Most of the instruments used to measure general creativity, musical creativity, and self-esteem were developed from the west. None of them were locally developed for local use. The Torrance Test of Creative Thinking and Self-Esteem of Musical Ability were used in many studies and had been reported to have high reliability and validity. However, there is no research conducted locally to validate the reliability and validity of Self-Esteem of Musical Ability in the local context. Nevertheless, the Aural Discrimination Test was adapted from the Musical Achievement Test by Colwell. This researcher modified the items in the test to suit the content of the study of the program.

The components measured in the Aural Discrimination Test vary according to the suitability of the test for the study. In this study there are six subsections developed by the researcher based on the Musical Achievement Test by Colwell. The subsections are pitch discrimination, interval discrimination, meter discrimination, cadence recognition, auditory-visual discrimination, and mode discrimination. The items in each subsection differ from those administered in the study by Auh (1995). Auh had three components in her study namely pitch discrimination, interval discrimination, and meter discrimination. Hence, the differences in the results of this study could be influenced by the differences of the items in each subsections.

There are numerous ways to measure and to determine the level of musical creativity. However, in this study musical creativity is measured through a composition test and the term musical creativity is limited to the compositional product. The evaluation of the compositional product is based on the judgement of five judges through the Amabile Consensual Assessment Technique. The dimensions to measure musical creativity are based on the four dimensions which are the creative dimension, technical goodness, musical sensitivity and repetition of song. Musical creativity is measured quantitatively. A qualitative approach could produce different results.

In the compositional task which required a brief experimental period of 20 minutes, only the white keys of a two octave range of a keyboard are allowed. This restriction is intended to keep students focused on the task and prevent them from losing interest (Laycock, 1992). The findings of the study could vary if there is no limitation of time or restriction on the first note of the composition.

1.7 Definition of Terms

The important terms as used in this study are operationally defined as follows:

1.7.1 General Creativity

The definition of *general creativity* as suggested by Torrance (1970) is taken as the operational definition of creativity in this study.

General Creativity - the abilities to create unique, artistic figures, drawings, or pictures. The creativity score is the sum of figural originality, figural elaboration, figural fluency, figural abstractness of title and figural resistance to premature closure.

Figural Fluency - the ability to produce many ideas, using figures in response to a task involving imagination. It refers to the test taker's ability to produce a large number of different figural images. It is the production of many ideas, using figures in response to a task involving imagination. To obtain this score, the researcher is required to count the number of different relevant alternatives, nonsense and irrelevant responses which fail to meet the instruction requirements are rejected.

Figural Originality - the ability to produce new or unusual types of ideas using figures in response to a task involving imagination. It is assessed by looking at the production of new or unusual types of ideas using figures in response to a task involving imagination. The scoring procedure has been streamlined by counting the most common responses as 0 and all other responses showing creative strength as 1.

Figural Elaboration - the ability to elaborate ideas using figures. It refers to the subject's ability to develop, embellish, embroider, carry out, or elaborate ideas. The scoring of elaboration is streamlined by having the scorer estimate the number of details within six sets of limits determined by normative data.

Figural Resistance to Premature Closure - resist closing on an idea until others have been explored. A creative person is able to keep open and delay closure long enough to make the mental leap that makes possible original ideas (Torrance & Ball, 2008). Less creative persons tend to leap to conclusions prematurely without considering all the available information. Hence, an uncreative person responding to the activities given in the Torrance Test of Creative Thinking will close the incomplete figures immediately with straight or curved lines, cutting off chances of more powerful original images.

Figural Abstractness of Titles - the ability to produce many different types of ideas in response to a task involving imagination. Hence, the ability to produce good titles involves the synthesizing and organizing of thought process to capture the essence of the problem based on the information obtained.

Creativity index – the total score of figural fluency, figural originality, figural abstractness of titles, figural elaboration, and figural resistance to premature closure added together with the 13 creative strengths.

1.7.2 Musical Creativity

The definition of musical creativity as suggested by Auh (1995) and Webster (1977) are taken as the operational definition of musical creativity in this study.

Musical Creativity - the ability to solve musical problems in original and coherent ways. In this study musical compositions are used to evaluate musical creativity. The dimensions used to measure musical creativity are creative dimensions, technical goodness, aesthetic appeal (musical sensitivity), and repetition of song. The creative dimensions consisted of musical fluency, musical originality, musical elaboration, musical resistance to premature closure, and musical abstractness of title. The technical goodness consisted of craftsmanship and musical syntax. The overall score of creative dimension, technical goodness, aesthetic appeal (musical sensitivity), and repetition of song is added to obtain a total score named overall musical creativity.

Musical fluency - the production of musical ideas or the number of creative responses. In this study, musical fluency is the ability to spontaneously respond and move at ease from one musical idea to another. A high score in the musical fluency category would mean that the composition contained many creative responses.

Musical originality - this is defined as the ability to which the composition is unique, when compared to the existing songs and different from the songs of others. According to Webster (1987), the key word of musical originality is “unique”. According to Neely (2006) originality is the degree of non-conventionality and novelty of the products or responses when compared to other member of the domain from which they come.

Musical elaboration - the production of musical ideas or phrases that are scored for the detail or complexity of content characteristics employed. In this study, musical elaboration is the ability of the student to build upon a musical idea by extending, reshaping, and refining the musical elements. It is the degree to which creative ideas are detailed and complex (Neely, 2006).

Musical resistance to premature closure – The ability to resist closing on an idea or motif and delay closure long enough to make the mental leap that makes possible original ideas. In this study, musical resistance to premature closure is the ability of the students to keep open an idea long enough before going to the next new idea.

Musical abstractness of title - The ability to produce abstract titles that are able to capture the essence of the composition.

Craftsmanship - this is defined as the ability to which the tonal and rhythmic elements in a composition show technical mastery in terms of tonal centre and rhythmic regularity. Kratus (1994) defined craftsmanship as tonal cohesiveness and metric cohesiveness. Tonal cohesiveness is the degree to which the pitches in a composition are constructed around a tonal centre. Metric cohesiveness is the degree to which the durations in a composition are constructed of regularly occurring accented and unaccented beats. The degree of tonal cohesiveness and metric cohesiveness decides the degree of craftsmanship of the musical composition. Nelly (2006) defined craftsmanship as the level of technical proficiency.

Musical Syntax - this is defined as the ability to which the tonal and rhythmic patterns in a composition are structured in a logical manner so that the music makes sense. Auh (1995) opined that the evaluation of musical syntax should "focus on the structure or big picture of the song rather than on small parts of the song" (p. 78).

Musical Sensitivity - This is defined as the ability to which the composition is musically expressive, so that the music reflects the aesthetic sensitivity in music. Webster (1987) defined aesthetic sensitivity as the shaping of sound structures to capture the deepest levels of *feelingful* response, achieved over the full length of musical work. Nelly (2006) defines it as the depth and quality of feeling captured in the dynamic form of a work.

Repetition of Song - this is defined as the ability to which the second playing of the composition is the same as the first playing of the composition. The subjects were required to play his or her composition twice at the end of the composition task. Repetition of song measures the degree of the sameness between the first playing and the second playing of the song.

Technical Goodness - the score of craftsmanship and musical syntax added up. According to Amabile (1977) technical goodness is the degree to which the design is good technically.

1.7.3 Musical Exposures

Other terms used in this study are:

Musical Exposures – Musical exposures in this study is the musical experiences of the trainee teachers with the focus on their exposures to musical experience when they are in the teacher education institutions. Only four types of musical exposures are look at considering the manageability of the researcher, namely keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability.

Keyboard Grades - The trainee teachers' keyboard grades are categorised into 5 levels. The levels are based on the trainee teachers' piano or organ qualification. These qualifications are certified from board of music schools such as the Associated Board of Royal School of Music. The lowest grade is grade 1 and the highest grade is grade 8. The trainee teachers who had a diploma in piano playing are categorised as grade 8 and above.

Musical Activity Involvement – Musical Activity Involvement is concerning the musical activities that the trainee teachers participated while they are in the teacher education institution. It is measured with the Musical Acitivity Involvement questionnaire.

Aural Discrimination - Aural discrimination is measured with the Aural Discrimination Test. The total score of the Aural Discrimination Test is the degree of aural skills. The aural discrimination term is also known as musical achievement in studies by Auh (1995) and Webster (1979).

Self-esteem of Musical Ability - This is defined as an individual's perception of self-formed through experiences with the world and interpretations of those experiences (Khien, 2003). Borg & Gall (1983) defined self-esteem as a set of feelings that each person has of his or her own self. The self-esteem in this study is musical self-esteem which consisted of the trainee teachers' self-perception of their musical abilities, the support, and recognition by others for their musical skills, and their personal interest and desire in music.

1.7.4 Socioeconomic Status

Socioeconomic Status - This is indicated by the father's occupation. The trainee teachers were categorised into the High Socioeconomic Status and Low Socioeconomic Status. According to Gan (1998), Palaniappan (1994), Siti Rafiah (2008), and Yong (1986) the father's occupation has been found to be the best index which is a reliable and valid indicator of socioeconomic status.

1.8 Summary

In this competitive society, the role of education is put to test in developing human capital that has the first class mentality and the ability to think creatively. Sadly, the Malaysian education scene is lacking in emphasis on encouraging students to be creative musically. The teacher education institution needs to produce quality teachers that have the ability to plan lessons that enhance creativity. Activities such as exploration, improvisation, composition, and creative performance will make music an interesting subject that enhances creative thinking.

In light of this, this study sought to examine the musical exposures of the trainee teachers in the area of keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability. In addition, this study also investigates the nature of creativity of the trainee teachers undergoing the bachelor of teaching in music education program. This study also investigates the trainee teachers' personal aspect such as gender, ethnicity, academic years, and family social economic status, and their relationships with musical exposures and creativity. The relationship of the musical exposures and creativity will provide an insight to music educators. Lastly, this study sought to determine the best predictor of musical creativity.

The next chapter, Review of Literature begins with the definitions of creativity and musical creativity. Following that, the instruments used in measuring musical creativity from respective studies are discussed. In addition, previous studies on musical creativity, general creativity, and musical exposures are reviewed. Then the relationships between personal variables and creativity found in previous studies are presented. The review on personal variables and creativity are presented followed by the discussion of the relationships between creativity and musical exposures. Finally, the literature on predictors of musical creativity and the consistent and inconsistent findings serve to provide insight to the degree of influence of musical exposures towards musical creativity.

Besides the review of previous studies, the theoretical model named the System Model of Creativity which this study is based on is discussed. Following that the theories related to creativity will be discussed in brief. The approaches to the study of creativity namely confluence approach and componential approach are discussed before the conceptual framework of this study is form.

CHAPTER 2

REVIEW OF LITERATURE

2.1 Overview

The purpose of this study was to investigate musical exposures and their relationships with musical creativity and general creativity among the Malaysian music major trainee teachers in the teacher training institutions. To investigate musical exposures, specifically, it looks into the aspects of keyboard grades, musical activity involvement, aural discrimination skills, and self-esteem of musical ability of the trainee teachers. This study also examined the musical creativity and general creativity of the trainee teachers and their relationship with personal variables in the aspects of gender, ethnicity, academic years, and socioeconomic status. The musical exposures and their relationships with musical creativity and general creativity were also examined. In addition, this study also determined the predictors of musical creativity and general creativity among the variables in musical exposures.

This chapter presents the review of related studies in the literature regarding the conceptualisation of creativity and musical creativity. It begins with a discussion of definitions of both creativity and the assessment of the product of creativity. The assessment of creativity in composition is deliberated to provide context for the present study. Studies of the relationships of musical creativity and general creativity with personal variables and musical exposures are reviewed to examine its consistent and inconsistent findings in various literatures. In addition, this chapter also presents reviews of the literature of predictors of musical creativity. Following that the theoretical framework and the theories of creativity related to this study are reviewed. The chapter concludes with an overview of the conceptual framework and a summary of the chapter. The foundation for the review of the related literature on the topic of musical exposures and creativity and their relationships were accessed from academic dissertations from the local and international context, research reports, academic journals, and professional books. They were accessed in electronic and print forms.

2.2 Defining Creativity

> *"The more I tried to say that creative people are such and such or creative people do this and that, the less sure I become about what creativity itself consisted of and how we could even begin to figure out what it was."*
>
> *Csikszentmihalyi, 1990 p.190*

The meanings of creativity are defined, conceptualised, and looked at from an array of perspectives by varying researchers in the literature. Prieto (2002) opined that the word creativity has been overused and sometimes misunderstood. There are already about sixty different definitions of creativity existed in the literature in the 1960's (Parkhurst, 1999) and to date, there is still no single definition or theory of creative thinking that is solely accepted by all researchers. The variation of the theories of creativity could be partly due to the richness of the topic itself, and the complexity of the construct of creative thinking. However, according to Kozbelt, Beghetto and Runco (2010), "it is probably a healthy viewpoint that theories of creativity is not being overly restrictive, lest researchers lose sight of important issues and potential connections" (p. 23).

Psychologists and researchers have presented the theories of creativity in a few different viewpoints through their studies and research on this matter.

Chua (2004) presented the theories of creative thinking from three perspectives based on the study of Murphy. Chua stated that there are three perspectives in creative thinking: supernatural, rational, and developmental. According to Chua, the supernatural perspective is a traditional view of creative thinking which believes that creativity in a person is inborn and the person is not made creative through training. This perspective is supported by Plato. Plato alleged that inspiration is the source of divine power that makes people creative. Most people think that artist work alone and they are blessed with a special gift or genius, not aware that the process of becoming an artist is generated through environmental and social cultural influence (Csikszentmihalyi, 1996).

The second perspective of creative thinking as stated by Chua is rationalism. In the perspective of a rationalist, the creative process is considered a natural consequences resulting from application of universal principles. Rationalist believed that creativity is generated by the conscious, deliberating, intelligent, and rational mind (Sawyer, 2012).

The third perspective of creative thinking according to Chua is developmental. Chua quoted two well-known scholars, Gowan (1979) and Torrance (1962), that man fundamentally prefers to learn in creative ways through creative problem-solving activities. Piaget and Vygotsky's view are also in line with this third perspective. Their developmental paradigm is associated with creative thinking where creative thinking develops over time and is mediated by an interaction of person and environment.

A good example of how a person develops his creative thinking skills is the famous sitar musician and composer from India, Ravi Shankar. Ravi Shankar displayed unusual gift in his teens. He then develops to be a famous sitar player and then a well-known composer. Hence, being a prodigy is not a requirement for later creativity. It is ones surrounding that could enhance the development of creativity (Csikszentmihalyi, 1996). According to developmental theory, creativity develops over time from potential to achievement, mediated by an interaction of person and environment. Developmental theories of creativity are among the most practical according to Kozbelt, Beghetto &

Runco (2010), because it suggests how to design environments so that the creative potentials of children will be fulfilled.

As the research on creativity deepens, researchers analysed and began to classify theories of creative thinking into different areas. Rhodes (1961) categories creativity into four: (a) process, (b) person, (c) press, and (d) products. The process describes the stages of the creative processes of a sequence of events the creative person thinks. Rhodes second category of creativity, person, is observed from the characteristic of the person: the differences between creative and non-creative person. Torrance (1962) identified three personality characteristic of creative children, namely, the reputation of having wild or silly ideas, the production of ideas off the beaten track, outside the mould and showing humour, playfulness, lack of rigidity and being relaxed. Press according to Rhodes refers to the environmental conditions necessary for creative activities. And lastly, product refers to the end product. Recently, the framework of the four categories of creativity has extended to six, adding the area of persuasion and potential (Kozbelt, Beghetto, & Runco, 2010). According to Simonton (1990), creative people change the way others think, so they must then be persuasive to be recognized as creative. This assumption shares with the social perspective by Amabile and Csikszentmihalyi (1996), stating that creativity involves interaction between a person's thoughts and sociocultural context. The sixth area of creativity is potentials. Creative potentials are divided into creative personality and places, and any other perspective that appreciates yet-unfulfilled possibilities and subjective processes (Kozbelt, Beghetto, & Runco, 2010).

Csikszentmihalyi (1996), the author of *Flow*, stated that the term creativity covers a wide area, thus causing a great deal of confusion. To Csikszentmihalyi, creativity is some sort of a mental activity, an insight that occurs inside the heads of some special people but this idea cannot be accepted as creative without reference to some standard in its sociocultural context. Csikszentmihalyi further stated that creativity can be observed in three main parts in a system, the domain, field, and person. The domain consists of a set of symbolic rules and procedures and is nested in the culture where the creative person lives. Field is the person who acts as a gatekeeper to the domain. They decide whether the new idea should be included in the domain. The person is the third component of creative systems. According to Csikszentmihalyi, creativity occurs when the person has a new idea. When this new idea or novelty is selected by the appropriate field for inclusion into the relevant domain then only the idea is considered as creative. Hence, Csikszentmihalyi defined creativity as any act, idea, or product that changes an existing domain into a new one. He further stated that a creative person is someone whose thoughts or actions change a domain, or establish a new domain. These domains can only change with the consent of a field responsible for it.

In 1949, J. P. Guilford, a psychologist in psychometric study of human intelligence, addressed the American Psychological Association, stating that more time should be given to investigate about creativity. Guilford believed that the study of creativity is a crucial aspect of human development. He encouraged his colleagues to devote more attention to studies of creative thinking because these studies are of great social importance. Empirical investigation of creative thinking flourishes after his speech concerning creative thinking (cited in Webster, 2002; Palaniappan, 2005; Yong, 1994). Guilford hypothesized that creative people typically possess intellectual factors. In Guilford's model of creative thinking, he has 24 divergent thought processes which later emerged into four primary concepts that are fluency, flexibility, originality, and elaboration. Fluency refers to the ability of the person to produce a number of appropriate responses during a limited time frame. Flexibility is the ability to produce different types of responses. Originality refers to the degree to which the responses produced are unusual or different. Elaboration is the ability to extend or enhances a simple idea. The divergent thinking abilities identified by Guilford form the underlying basis for many of the approaches used to study the creative thinking today.

A well known name in the study of creativity, Paul E. Torrance developed one of the most widely used measures of creative thinking named the Torrance Tests of Creative Thinking. Torrance builds the Torrance Tests of Creative Thinking based on the work of Guilford where he used Guilford's concept of fluency, flexibility, novelty, and elaboration as a basis for measuring creative ability (Torrance, 1970). Torrance and his associates later developed several batteries of test activities for use in all cultures from kindergarten through adult. In 1983, Torrance added two norm-reference measures to the streamlined scoring in his Torrance Test of Creative Thinking. Abstractness of title is added based on the idea that creativity requires one to sense the essence of a problem, to know what is truly essential and that this is reflected in the level of abstraction given to the title of the pictures drawn. Resistance to premature closure measures the ability of a person to "keep open" in processing information and to consider a variety of information. According to Torrance, these two measures are important in the determination of the creative level of a person. Hence, there are five norm-referenced measures in the Torrance Test of Creative Thinking that are fluency, originality, elaboration, resistance to premature closure, and abstractness of title.

The five characteristics of creative thinking are defined by Torrance (2008) as:

1. Originality : infrequency and unusualness of the response
2. Fluency: the number of ideas a person expresses through interpretable responses that use the stimulus in a meaningful manner
3. Elaboration: the imagination and exposition of detail in a function of creative ability

4. Resistance to premature closure: the ability to keep open and delay closure long enough to make the mental leap that makes original ideas possible
5. Abstractness of title: the ability to produce good titles involves the thinking processes of synthesis and organization.

The Torrance Test of Creative Thinking has been used in over 1000 published research studies in various fields (Torrance, 2008), including music related research (Hlasny, 2008; Kiehn, 2000; Russo, 2004; Squeglia, 1994; Struthers, 2008; Vaughan & Myers, 1971; Webster, 1979).

In conclusion, there is no single definition of creativity. But there is a general consensus that theories of creativity conceptualised by psychologists and researchers are categorized into three perspectives: supernatural, rational, and developmental, and six areas of creativity: process, product, person, press, persuasion, and potential. The literature also provides information concerning the influence of the development of creativity by the environment and social cultural factors. The formation of the five characteristics of creative thinking (1) fluency, (2) originality, (3) elaboration, (4) resistance to premature closure, and (5) abstract of title, provides a view of the creative process to problem solving in producing a creative product. Even with agreed definitions, the approaches to explain creativity are diverse.

2.3 Defining Musical Creativity

As with the term creativity, the definition of musical creativity too causes confusion to educators and researchers. This is because the nature and measurement of musical creativity have been borrowed from theories of general creativity. The study of creativity in music involves a complex combination of cognitive and affective variables. The inability of theories and psychologist to clarify how the inspiration for creative ideas came about further complicates the possible understanding of musical creativity (Webster, 2002).

The term musical creativity has been used in many different contexts. Hounchell (1985) examined how the term musical creativity is used in research articles in journals. He stated that “the term tends to be used in a casual, unnecessary, and sometimes gratuitous manner” (p. 456). Hounchell stressed that the word musical creativity needs to be more precisely described. Swanwick and Tillman (1986) regarded creative activities as arts activities or as activities that focus on imagination and compositions that children make by themselves. Composition and improvisation, is regarded as creative art activities by Swanwick (2011).

In an early study in 1987, a notable scholar in the area of creative thinking in music, Peter Webster conceptualised the first model of musical creativity named Conceptual Model of Creative Thinking in Music based on Guilford’s theories that creativity consists of divergent thinking factors (Webster, 1987). In his model, there are three principal ways in which people involve themselves with music as an art that is by composing, performing or improvising, and analysis. These three ways are product intentions and they are goals to creative thinking. Webster further stated that for the creator to produce a creative product, enabling skills, and enabling conditions are needed to promote the thinking process. Webster terms these enabling skills as musical aptitudes, conceptual understanding, craftsmanship, and aesthetic sensitivity.

According to Webster, musical aptitudes are concerned with tonal skills and rhythmic imagery, musical syntax, musical extensiveness, flexibility, and originality. Conceptual understanding is a single, cognitive fact that comprises the substance of musical understanding. Craftsmanship is the ability to apply factual knowledge in the service of a complex musical task, and aesthetic sensitivity is the shaping of sound structure to capture the deepest levels of *feelingful* response. Webster further stated that there are other influences on the thinking process that are not musical and these influences vary from person to person and mingle with the enabling skills. Motivation, subconscious imagery, environment, and personality are named enabling conditions by Webster. The four conditions mentioned by Webster are not to be taken lightly since there are great deals of research done on these conditions individually.

Other than the product of creative thinking, Webster also conceptualised the process of thinking in his model. According to Webster, creative thinking in music is a dynamic process of alternation between convergent and divergent musical thinking, moving in stages over time, enabled by certain skills and by certain conditions and resulting in a final product. Creative thoughts move from one type of thinking that is divergent thinking to a second type of thinking which the convergent thinking is. In the process of thinking there are four stages of operation that are preparation, incubation, illumination, and verification. These four stages are the same as proposed by Graham Wallas in 1926 (Webster, 2002).

Webster stated that one employs divergent thinking skills in the beginning to solve a problem and later progresses through the stages of the operation and eventually converging upon a solution. The process of thinking is influenced by the enabling skills and enabling conditions. A very important element of the Webster's model is that, the creative thinking process engages both divergent and convergent types of thinking (Barker, 2003; Webster, 1990a). Divergent thinking involves the ability to generate multiple solutions or ideas for a particular problem. Convergent thinking involves the ability to consider numerous possibilities and distinguish the best possible solution. However, the movement from divergent to convergent thinking in the Webster's model is considered rigid according to Weisberg (1986) and Perkins (1981). Weisberg stated that "there is evidence to indicate that divergent thinking is not crucial to creativity, and creative solutions to problems come about by means of thought processes that are no different from those involved in other sorts of thinking" (McLennon, 2002, p. 41). Hence, Webster's conceptual model of creativity in music though are accepted by most researchers has some weakness in regards to its rigidness and its influence of cultural and social context in musical creativity.

Swanwick and Tillman (1986) developed a sequential model for the creative musical development in children based on Piaget's theory of play development. Swanwick and Tillman analysed over 700 compositions composed by children to identify this sequential model of musical development. This spiral model implied that as a new level is reached, the others are not forgotten. The four part model is designed with mastery at the lowest level. The second level is imitation where expressive character, accommodation, spontaneity, and the use of common musical conventions. The third level is imaginative play where there is no a rule or limitation and the structure is developed. Metacognition is the highest level, the ability to communicate, expressive composition using original material. Swanwick and Tillman suggested that their findings regarding children's musical development have implications for music curriculum planning (Auh, 1995).

In conclusion, this section discussed the Conceptual Model of Creative Thinking by Peter Webster (Webster, 2002), and Swanwick and Tillman (1986). Both models are built on the creative process and creative product from composing as a creative activity. Though most of the models of creative thinking are for divergent thinking, Webster in his model stated that creative thinking skills engage both divergent and convergent thinking. Improvisation, composition, and analysis are creative products which are the results of the creative thinking process.

2.4 Measuring Composition and Consensual Assessment Technique

Music composition was considered by Webster (1979) as the "organization of sounds and silence through symbols yielding a symbolized sound structure that can be aurally realized by others" (p. 229). He further stated that when a music composer composes, that is when given a problem, the composer solved it by following a problem-solving procedure. This problem-solving procedure arises from the need to compose and responding to the inner drive forming hypotheses in the form of small music units or ideas. These small music ideas are then subjected to modifications, and synthesized into a finished sound structure. The process of composing from a given problem to the complete structure of composition as stated by Webster is similar to many other creative processes.

Composing is defined as "to put together, make up, to make by putting together parts or elements; to make up, form, frame, fashion, construct, produce" by the Oxford Dictionary (2013). In music, compose means to invent and put into proper form. Carlin (1999) defines composing as a generative gesture, plus revision, in an expressive medium. It is not just a first response like improvisation, but an ongoing, interweaving combination of exploration, editing and polishing. A composer has the opportunity to revise unlike improvisation where the creator performs an instant composition.

There are various models built by researchers to assess musical creativity. In 1977, Margery Vaughan made the first significant attempt to measure creative thinking in music. Factors measured from the improvisation activities in Vaughan's model are musical fluency, rhythmic security, and ideation (Vaughan, 1977). The activities carried out in the Vaughan study include improvisation of rhythm patterns from a given stimulus, improvise a given melody, and improvise a piece to show how the subject feels during a thunderstorm. A panel of judges using a scoring scheme evaluated the product of the improvisation. The panel of judges was used in the assessment in order to establish acceptable interjudge reliability. The procedure suggested and carried out by Vaughan in assessing the product of creativity is similar to the techniques of assessment developed by Amabile (1996).

Amabile (1996) developed a social psychological approach to creativity assessment called the consensual assessment technique. This technique is based on the subjective assessment of the creative product. According to Amabile, a product is considered creative when the independent observer or evaluators agree that it is creative. She further emphasised that the appropriate observer must be those familiar with the domain in which the product was created. Amabile offered three criteria in selecting a task. Firstly the task must lead to an observable outcome that can be assessed. Secondly the task must be open-ended to encourage flexibility and originality and lastly, all subjects must be able to adequately perform the task.

As for the judges' criteria, Amabile suggested five principles to be followed. First, the judges must be familiar with the domain and function as outside observers to the study. Second, the judges must make their assessment independently, without training or interference from the researcher, and without specific criteria for rating creativity. Third, the judges must rate other aspects of the product such as aesthetic appeal and technical goodness. Fourth, the judges should rate the products relative to one another rather than by a pre-set standard, and lastly the products and rating categories should be presented to the judges in random order. The rating of all the judges was then analysed and interjudge reliability reputed. According to Amabile, it is important that the interjudge reliability index needs to be high because the interjudge reliability of this method of assessment is equivalent to construct validity. Amabile has successfully used this technique to evaluate products in verbal creativity, visual arts, and problem solving.

The reliability coefficients analysed by Amabile on each group of judges was found to be as follows: composers, $r = .04$; all music teachers, $r = .64$; music theorists, $r = .73$; instrumental teachers, $r = .65$; general or choral teachers, $r = .81$; seventh grade children; $r = .61$; and second grade children, $r = .51$. The strengths of the coefficients showed that judges who are familiar with the creative product had a high correlation (Amabile, 1996).

The Amabile's consensual assessment technique was used in many studies such as Auh (1995), Bangs (1992), Barker (2003), Brinkman (2010), Byrne, MacDonald & Carlton, (2003), Hennessey, (1994), Hickey (2001), McCoy (1999), Menard (2009), Priest (2001, 2006), Smith (1992), and Traxler (2008). According to Baer & McKool (2009), the Consensual Assessment Technique is called the "gold standard" (p. 66) of creativity assessment and this technique is a well validated tool for assessing creativity.

For example, Hickey (2001) tested the reliability of Amabile's consensual assessment technique on fourth and fifth grade children. The musical composition of the children and the reliability of different groups of judges were investigated. Hickey had chosen twelve randomly selected compositions which were rated by five groups of judges for creativity, craftsmanship, and aesthetic appeal. Hickey concluded from the reliability coefficients found in Amabile's study that music teachers' training and experience in the classroom provides them with the strategies necessary to make consistent and valid judgements about the creativity of children's musical compositions using a subjective assessment tool.

Other than the consensual assessment technique developed by Amabile, there are other instruments used to measure musical creativity. Gorder (1980) developed a model based on Torrance and Guilford concept named Measures of Musical Divergent Production. The factors of musical creativity were rated according to musical fluency, musical flexibility, musical elaboration, musical originality, and musical quality.

Gorder defined musical fluency as the production of musical ideas from music information. The musical ideas can be in the form of melodic motive or musical phrase. Scoring for the shifting or changing in ideas or phrases is defined as musical flexibility. Gorder further states that musical elaboration is the production of musical ideas or phrases that are scored for the detail or complexity of content characteristics employed and musical originality is the production of musical ideas or phrases that are scored for the use of musical content characteristics rarely used by the population to which the subject belongs. The fifth musical ability that is musical quality is the production of musical ideas or phrases that appeal to musicians' musical sensitivity. Gorder stressed that musical quality adds a global musical ability into the assessment of musical creativity rather than just than specific divergent production abilities of creativity.

However, Gorder in the discussion section stated that his study did not attempt to consider all the possible component constructs of musical creativity, nor did it consider divergent production abilities to be the totality of abilities necessary for creative production.

The subjects in Gorder's study were required to respond to stimuli by singing, whistling, or by playing a familiar instrument. The tasks were represented as skeletal music notation, and the subjects were asked to improvise using the motives, note beats, or contour markings as guides. There were four subtests and subjects were allowed three minutes for each subtest.

Other than Measures of Musical Divergent Production by Gorder, in 1994, Peter Webster developed Measure of Creative Thinking in Music. The factors to measure creativity in Webster's Measure of Creative Thinking in Music are musical extensiveness, musical flexibility, musical originality, and musical syntax (Webster, 1994). Musical extensiveness is measured by counting the actual seconds of time a child is involved in a task. Musical flexibility looks at the extent to which the musical parameter of pitch, tempo, and dynamics are manipulated. It is measured by observing the manipulation of musical parameters. Other than that, musical originality looks at the ability to generate unique idea, and musical syntax looks at the extent to which the response is inherently logical and makes musical sense. Webster suggested that a panel of judges would be needed to evaluate musical originality and musical syntax for best results.

Barker (2003), in his research on children's musical thinking skills and creative processes during a composition task, evaluated the children's composition according to the procedure require by the consensual assessment technique by Amabile. Barker had three judges to evaluate the composition using a rubric to assess the musical characteristic of each child's final work. The evaluation tool used by Barker was influenced by the dimensions of creativity described in Webster's Conceptual Model of Creative Thinking in Music (Webster, 1987), and Amabile's Components of Creative Performance (Amabile, 1983).

Barker followed the suggestions stated by Amabile concerning judges' knowledge and experience. Hence, the judges in Barker's study were from the same domain that has the knowledge to judge the compositions. Each judge was given a written instruction and evaluation forms, a CD recording of all the compositions in random order, and notated copies of compositions with the accompaniment. The judges independently judged the compositions according to the guidelines suggested by Amabile. Barker used a 7-point Likert-style scale to rate the degree to which the judges felt about each category were derived in part from scoring factors used by Webster and Amabile. Barker divided the composition evaluation into two sections. The first section included a combination of the domain-relevant and task motivation skills: steady tempo, phrasing, closure, craftsmanship, harmonic changes, replication, motivation/effort, and originality. The second section included creativity-relevant skills: musical syntax, musicality, and creativity.

Brinkman (2010) also used Amabile's consensual assessment technique in his study concerning the effect of problem finding and creative style of the musical compositions of high school students. The dimensions of creativity used in Brinkman's study were originality, craftsmanship, and aesthetic value. The melodies were rated by three judges using a 7 point Likert-scale rating form and the total score of these dimensions is the composite score of creativity for each melody.

Daignault (1996) same as Brinkman, used creativity, craftsmanship and aesthetic appeal as the dimensions in his study on children's creative musical thinking within the context of a computer-supported improvisational approach to composition. Daignault had five judges to rate the composition according to the categories of craftsmanship and creativity. The judges were selected from experienced general music educators who have the knowledge of composing. Unlike Brinkman and Barker, Daignault used a 5 point Likert-scale rating form.

Other than the above research, a more recent study was carried out to develop and validate assessment rubrics for use in assessing the undergraduate music composition. Nelly (2006) developed an assessment rubric for composition that has four main constructs: craftsmanship, musicianship, communication of ideas, and creativity. In each of these construct, there are criteria. Twelve professors examined and commented on the composition rubric. These professors' ages ranged from 34-74 and had 5-50 years of teaching experience. They were active composers. The findings in the study stated that the construct of music composition that are suitable to evaluate the undergraduate music composition are craftsmanship, musicianship, creativity, and communication of ideas. Nelly discussed her suggested music composition construct in detail in her study. According to Nelly, the inclusion of craftsmanship is supported by the fact that technical skills are necessary for success in music composition. In the discussion section in her study, Nelly suggested that a flexible rubric is more suitable in assessing composition. The construct in the comprehensive list in the rubric presented in her study can be selected based on the manner of the study.

Recently, Menard (2009) investigated student attitudes and teacher perceptions regarding creativity, composition and its assessment possibilities using a mixed-method technique in two differing high school music programs. Menard examined a Talented Music Program which provides accelerated instruction to gifted musicians with composition instruction and a typical performance based band program without composition instruction. The final compositions were evaluated by judges from various fields who were teachers, students, and expert composers. Menard used the Amabile's consensual assessment technique to assess the compositions. Menard revealed that the composers were the least reliable judges of creativity. The most reliability judges were the teachers.

Due to the reliable and valid measurement, composition has been used as a measurement of musical creativity as a creative problem-solving activity (Auh, 1995; Baek, 2009; Baltzer, 1988: Bangs, 1992; Boehm, 1999; Byrne, MacDonald & Carlton, 2003; Daignault, 1996; Emmons, 1998; Hickey, 2001; Kennedy, 2002; Laycock, 1992; Menard, 2009; Yannon, 2011).

In conclusion, the above literature supports the measurement of musical creativity and concludes that musical creativity can be reliably measured. Criteria for assessing the creativity of music compositions varied according to research and their conceptual model. However, the element of creativity, aesthetic appeal, and technical goodness as suggested by Amabile is widely used and accepted as suitable construct for musical creativity measurement though the term used to name these criteria varied. Other than the criteria of measurement, the procedure of assessment and judges' selection for the evaluation of the compositions of this study follows the suggestions by Amabile. Amabile's three dimensions in the rating scale that were creativity, technical goodness and aesthetic appeal were used as a guide in the assessment of the compositions in this study.

2.5 Musical Creativity and Measurements

Studies on musical creativity for students of various age levels have been conducted by several researchers since about 1970 (Baek, 2009). Though there is a lack of clear definition of musical creativity, there is a common usage referring to the behavioural-type objective of teaching students to compose music.

There are many forms of creative thinking in music according to Webster (1990b, 2009). Composing, arranging, improvising, and choreographing music are activities that enhance creative thinking. In these activities, students may invent their own notation or create listening maps of musical compositions. Squeglia (1994) agrees with Webster stating that exploration, improvisation, composition, and creative performance are creative activities. According to Squeglia, exploration is a prerequisite to the creative process. After the students have explored, he or she will improvise. The strategies of combining sounds and creating pattern give the music a coherent structure forming a composition. Squeglia further noted that the final creative activity is performance. Hence, the mental process of thinking in sound, make aesthetic decisions about the sounds, and produce products that can be evaluated by themselves and others are defined as musical creativity (Baek, 2009).

Composition has been used by many researchers to investigate relationships of factors with musical creativity, or effect of the assignment task with musical creativity (Auh, 1995; Bangs, 1992; Daignault, 1996; Hickey, 2001; Kratus, 1989; Laycock, 1992; Levi, 1991). Kiehn (2000) states that music creativity can be reliably measured. In his study, Kiehn reported that the interjudge reliability coefficients obtained for an adapted version of the Vaughan Test of Musical Creativity were satisfactory and above most figures reported for other music creativity measure in the literature. However, the results obtained were inconclusive.

Auh (1995) defined musical creativity on the basis of the ideas of product-orientation and problem-solving abilities. According to Auh, "musical creativity is the ability to solve musical problems in original and coherent ways" (p. 20). The five dimensions chosen for the composition ratings by Amabile (1983), Kratus (1994), Laycock (1992), Russ (1993), and Webster (1987), are craftsmanship, musical syntax, musical originality, musical sensitivity and repetition of song. However, Nelly (2006) conducted a study to develop and validate assessment rubrics for use in assessing undergraduate music compositions. The four constructs suggested in Nelly's findings are craftsmanship, musicianship, communication of ideas, and creativity. Results from the study also suggest that the rubrics designed based on these constructs are valid assessment tools for use in composition.

In one study, Baltzer (1988) examined the reliability of the Measures of Creativity in Sound and Music, and compared the subjects' academic achievement scores, sex, and age with scores of musical creativity rated by the subjects' teachers. The reliability of the Measure of Creativity in Sound and Music, a test developed by Cecilia Wang was validated. Baltzer in his literature review stated that researchers have placed a high value on the growth of musical creativity. However, the development of musical creativity research has lagged behind compared to general creativity. Baltzer also reviewed a few instruments that were developed and used by past researchers such as Musical Creativity Test by Vaughan, Measures of Musical Divergent Production by Gorder, and Measure of Creative Thinking in Music –Version II by Webster.

In Baltzer's study, he assessed musical creativity by using the Measures of Creativity in Sound and Music. In addition to the purpose of the study that is to examine the interjudge and inter-item reliability, Baltzer also explored the relationships between Measures of Creativity in Sound and Music with academic achievement, sex, age, and teacher's ratings of subjects' creativity.

Subjects of Baltzer's study were second grade students from a public elementary school in a small Midwestern town. The selected 32 students received two 25-minute music lesson per week. The musical skills taught to the second graders were listening, singing, and analysis skills by a music specialist. In the study, the subjects underwent four activities that were planned in the Measures of Creativity in Sound. Activity 1 required the subjects to produce different examples of steady beat using two plastic containers and lids as sound sources. Activity 2 required the subjects to imitate, with rhythmic instruments, a series of six described events defined by the test administrator. In activity 3, the subjects were asked to play as many different ostinatos as possible from the given two notes that are note C and G on a bass Orff xylophone. The last test required subjects to move in appropriate ways to six selections of recorded music. In all, each subject spent 20 to 30 minutes to complete the whole process.

The Stanford Achievement Test was used to obtain students' academic achievement score and a researcher-constructed instrument was used to rate the subjects' musical creativity. There were six items in the component of creativity that are fluency, flexibility, originality, elaboration, imagination, and independence of thought. A 7-point Likert scale was used.

Baltzer found that the correlation between the music teacher's ratings of musical creativity and the classroom teachers' ratings were quite low. He explained that the lack of agreement between these two rates may be due to the fact that music teacher was rating musical creativity while the classroom teachers were rating general creativity. However, Baltzer stressed that "one should not interpret the low correlations between teacher ratings and creativity scores as an indictment of the Measure of Creativity in Sound and Music's construct validity" (p. 245). Baltzer found that there is no significant difference between the responses of males and females in any of the creative activities. He also found that there is a positive but no significant relationship between age and creativity. Baltzer carried out a regression analysis and found that music teacher's ratings were the best predictor variable for musical fluency, and academic achievement however, is not a significant predictor for any dimension of creativity. Baltzer suggested that more regression analysis should be carried out to investigate variables such as music aptitude, music achievement, and personality factors.

In 2000, Mark Thomas Kiehn conducted a study on the development of musical creativity in elementary school students. The primary purpose of the study was to compare the music creativity scores and figure creativity scores of students in grade two, four, and six. In addition, female and male students' creativity scores were compared. Kiehn (2000) also examined the relationship among music creativity, figural creativity, academic self-concept, and academic achievement. According to Kiehn, studies of musical creativity and various individual difference variables such as gender, self-concept, and academic achievement reveal no clear relationships. The goal of his study was to address and clarify the inconsistent findings of previous creativity research. On top of that, studies on developmental differences among students in grades two, four, and six in improvisational skill were insufficient. There were four important areas that Kiehn investigated. First, can music creativity be reliably measured? Second, are there significant gender or grade level differences for music creativity score on the Vaughan Test of Musical Creativity? Third, are there significant gender or grade level differences in figural creativity score on the Torrance Tests of Creative Thinking?

Fourth, what relationships exist among music creativity, figural creativity, academic self-concept, and academic achievement?

Kiehn used four instruments in his study. The Vaughan Test of Musical Creativity was used to measure musical creativity. Criteria chosen for scoring were music fluency and originality. The Torrance Tests of Creative Thinking Figural Form A was used to measure students' figural creativity. Only the figural fluency and figural originality scoring were used in this study. The Marsh Academic Self-Description Questionnaire was used to measure self-perceived competence related to 12 content areas. The questionnaire has a six-point Likert-type scale and the item response range is from false to true. There were six questions for each content area of reading, math, music, and art. To measure academic achievement, Kiehn used the Iowa Tests of Basic Skills, Survey Battery Edition, and Form K. Academic achievement test was administered by the school district every spring to all students and the results were kept in the school files.

Kiehn took eight weeks to administer his study. He used participants' regular music class time. The Vaughan Test of Musical Creativity was administered by Kiehn himself and participants individually completed six tasks. Task 1 was an un-scored warm-up task to allow students to gain confidence in their performance. In task 2, students listened to three rhythms played by the tester and respond with an answering rhythm accordingly. The answering rhythm was played on the tom tom drum. In task 3, students improvised a rhythm on the tom tom drum according to the beat played by the tester. The length of time given was one minute. In task 4, the tester would play three 2 bar melodies on the bells, and students responded with an answering tune on the black bells only. Task 5 required the students to improvise a tune on the white bells only while the tester played an ostinato melody. The last task, free experiment, required students to make up a song showing how she/he feels during a thunderstorm. The students were asked to use the drum, bells, and/or any sound he or she wishes. The length of time was up to two minutes. The total administration time was approximately 10 minutes. Responses to test tasks were audiotaped. Two independent trained judges scored the Vaughan Test of Musical Creativity. Kiehn also used the Torrance Tests of Creative Thinking, Figural Form A to measure divergent thinking skills and Marsh Academic Self-Description Questionnaire to measure self-perceived competence. Both instruments were administered in groups.

In the study, descriptive statistic, two-way analysis of variance, post-hoc Tukey test, and Pearson product correlation analysis were used to analyse data. From the analysis of the Vaughan Test of Musical Creativity, Kiehn found male student's music creativity level is higher than the female students. The mean score for males was 29.33 and the mean score for females was 27.59. He elaborates the findings by stating that "Perhaps male students simply function more creatively with respect to fluency and originality" stated Kiehn (2000, p. 116).

Besides that, Kiehn also found that there is a plateau in the development of music creativity for students after grade two. The mean music creativity score for grade two students (26.15) was significantly lower than that of students in grade four (29.36) and grade six (29.98). However, the mean score for grade four and grade six students was not significant. Kiehn's finding is similar to Brophy (2002, 2005) and Kratus (1994). The occurrence of the plateau could be due to curricular factors such as focus by music educators towards convergent thinking, or sociological factors where students shy away from being different so that they are not viewed negatively by other students.

Unlike the findings found on music creativity, analysis from the Torrance Test of Creative Thinking showed no significant gender by grade level interaction or gender main effect. However, music creativity and figural creativity both showed the same pattern - there is a plateau in the figural creativity scoring after grade two. The mean figural creativity score for grade two students (176.26) was significantly lower than that of students in grade four (204.21) and grade six (214.20), and the mean score of figural creativity for grade four and grade six students was not significant.

Kiehn also found that there was a significant relationship between musical creativity and figural creativity but the size of the correlation was modest (r = .22). According to Kiehn, the findings suggest that the ability to draw artistic shapes and figures may be related to the ability to create music improvisations.

Academic achievement was not significantly related to either music creativity or figural creativity scores. This finding is inconsistent with results from other research. The difference in the correlation results could be the cause of the type of academic achievement data according to Kiehn.

What is the view that could be emulated from Kiehn's study? First, academic achievement in Kiehn's study was only on reading and maths. It did not look at the overall academic achievement of the subjects that the respondents were studying. Second, Kiehn did not investigate all the components of creativity. He only investigated on fluency and originality. Elaboration and flexibility were not assessed. The findings from Kiehn's study showed a high inter-correlation between fluency and originality. This indicates that fluency and originality criteria were probably measuring similar or related creative abilities. Hence more complex aspects of creative process should be used to measure musical creativity and figural creativity. Third, Kiehn stated that musical creativity can be reliably measured. His study showed that the reliability coefficients from the interjudge scores obtained were satisfactory. Kiehn had two judges to score the Vaughan Test of Musical Creativity. Lastly, the findings concerning gender differences for creativity has produced very inconsistent results.

In another study, Baek (2009) examined the effects of a music instruction using picture books and related creative activities on the musical creativity, music aptitude and reading ability of children in a kindergarten in Seoul. The children were randomly assigned to treatment (n = 20) and the control group (n = 19). Both groups received general music classes in which the picture books were read. Music instruction using picture books with related music creative activities were conducted for the treatment group for 8 weeks and the control group did not engage in creative music activities. It was found that there is a statistically significant difference between the treatment group and the control group in musical creativity scores, music aptitude and reading ability where the experimental group achieving a higher score. Hence the opportunity to engage in creative music activities can support musical creativity, music aptitude, and reading ability. Musical flexibility and musical originality in the Measure of Creative Thinking in Music II designed by Webster scored higher by the experimental group in the study. The study further showed the correlation analysis of musical creativity, music aptitude, and reading ability, and found that they are related to each other at low or moderately low levels.

Hickey (2001) examined the relationship between creative musical thoughts processes of children and the creative and craftsmanship qualities of their resulting musical composition. Hickey found that the design of the task, open-ended and heuristic, rather than contrived to be more conducive to creative thinking. In addition, Hickey found that students who were able to manipulate open-ended tasks successfully were more likely to be creative thinkers.

Daignault (1996) examined children's computer mediated strategies in relation to the craftsmanship and creative qualities of their resulting music compositions. He found that students in groups designated as low in compositional craftsmanship and creativity spent more of their time in the experimental or improvising process stage while students designated as high in compositional craftsmanship and creativity moved quickly from the improvisation stage and used the improvisations generate composition products. Students in the high creativity group manipulated improvisation and students in the high craftsmanship group manipulated notation. He also found that piano study had an effect on students' compositional products.

Levi (1991) attempted to identify, describe, and compare components of the composing process. Six second grade students were given multiple opportunities to compose using both music and written language sign systems. They were observed over a seven week period while working in the context of their classroom. The results of the exploratory study indicated that there are five recursive phases that students move while creating their pieces in both domains. The phases are exploration, focus, rehearsal, composing and editing. Levi further stated that students who do not have the experience in composing will need a longer time to explore.

Besides that, Laycock (1992) found that musical experiences were the second significant factor related to compositional ability of high school students among five variables of musical experiences, musical self-esteem, musical aptitude, academic grades, and age.

In conclusion, the above review proposed that composition is a measurement used by researchers to measure musical creativity. Composition is a musical creativity product and the process of composing is a creative process. A creative musical composition should consist of creative aspect, and technical aspect. Hence musical creative measure in this study, as suggested by the literature review has four components namely creative dimension, technical goodness, aesthetic appeals, and repetition of song.

2.6 General Creativity and Measurements

Concern and interest on general creativity started during the time of Greek philosophers where studies were carried out on geniuses. Later, in early 1900s, the biographies and autobiographies of well-known individuals selected as creative individual were studied (Amabile, 1977). These studies hoped to define the peculiar qualities, intellect, and personality of the creative people. The growth of formal study of creativity, however, has been slow until J. Paul Guilford noted in his keynote address to the American Psychological Association that there is a lack of attention paid to divergent thinking (Webster, 2002). Since then, the growth of formal study of creativity has begun and theories of creativity emerged.

However, it was in 1962 that a great impact on research into creativity begins when W. Getzels and P.W. Jackson published a study on 449 high school children in Chicago where a group of middle class adolescent pupils who had scored well on intelligence tests were given a test of creativity as suggested by Guilford. It was found that the highly creative children were superior in scholastic achievement compared to pupils with high I.Q. The highly creative students had 20 I.Q. points lower than the high I.Q. students. The findings in the study drew lots of criticisms hence many researchers replicated the study such as Torrance, Yamamoto, Ahrens, Jacobsen, Lucht and many more (Palaniappan, 2005).

Back in the sixties, two researchers, Roderick (1965) and Simpson (1969), began an interest in examining music students' general creativity. Roderick looked into the relationship between scores on creative thinking tests and factors of musical aptitude, musical achievement, and scholastic ability. The subjects were 48 college music education majors. Torrance Test of Creative thinking, Wing Musical Intelligence Test, Drake Music Aptitude test, and Aliferis Music Achievement Test were administered. Results showed no correlation between the tests of creativity and any of the other factors. Simpson measured the effect of nine different courses of music study on general creative potential. The experimental design consists of 173 high school music students and 45 non-music students as the control group. IQ, sex, grade level, and musical aptitude variables were examined. Guilford type test and Drake Musical Aptitude Test were administered as pre and post-tests. Guilford test measured five different factors of general creativity including fluency, divergent production, elaboration, spontaneous flexibility, and originality. Results showed that the experimental group made significant gains at the .01 levels of fluency, elaboration and spontaneous flexibility. Variables such as IQ, sex grade level and musical aptitude had little or no effect on the results.

In the later years, Wolff (1979) conducted an experimental study of the effect of general music education on non-musical factors of academic achievement, perceptual motor development, and creative thinking. The experimental group consisted of a group of first graders who received a half hour per day of music instruction for one year. The control group received no music instruction. The pre and post tests conducted using the Torrance Test of Creative Thinking and Simons Measurement of Listening Skills. Results show that the experimental group achieved significantly higher score on all measure of the TTCT and originality scores were the highest.

In Korea, a study was conducted by Son (2009) to 295 students from a Korean middle school. Students' scientific knowledge and inquiry skills were measured using two scientific achievement scores and one score by performance assessment. The Test of Creative Thinking-Drawing Production was used to measure creative competence. To assess scientific creativity, one open-ended scientific problem was used and three judges rated the level of scientific creativity through the Consensual Assessment Technique by Amabile (1996). The results show that scientific proficiency and creative competence correlate with scientific creativity. Intrinsic motivation and the context components do not predict scientific creativity. It was reported that the strength of the relationships between scientific proficiency and scientific creativity (estimate parameter = 0.43) and creative competence and scientific creativity (estimate parameter = 0.17) are similar.

Gomes (2005) conducted an action research to discern if a creativity-focused science curriculum for the kindergartens at a Montessori early learning centre could increase creativity in students. Observations were conducted in two classrooms, one using the creativity-focused science curriculum and the other using the existing curriculum. Interviews with students, parents, and teachers were conducted together with the administration of Torrance's Thinking Creatively in Action and Movement (TCAM) test. The data indicated that the enhanced science curriculum played a role in enhancing the creativity of the children in the creativity-focused group. The results of the TCAM showed a significant increase in scores for children in the creativity-focused group.

There are only a few studies concerning general creativity conducted in Malaysia. In 1986, Leonard Yong M. S., conducted a study to investigate the creative abilities of Malaysian secondary pupils (Yong, 1986). His study also investigated the relationships between creativity and personal variables, home-related variables and school-related variables. The variables that Yong investigated were sex differences, socioeconomic status, home environment, intelligence, cognitive levels, self-concept, academic achievement, and learning style. According to Yong, there was very little investigation on the creative abilities of the Malaysian pupils. In order to achieve the objectives of the education system to develop the technological manpower for the nation's industrial programmers, it is crucial to understand the creativity aspect of young Malaysian and the effects of certain correlates of creativity. Furthermore, according to Yong, the current evidence reported in international publications regarding creativity and its relation to personal, home-related, and school-related variables were far from conclusive.

In Yong's survey study, the respondents consisted of 397 Form Four Malaysian pupils from five secondary schools in the metropolitan city of Kuala Lumpur and the suburban town of Petaling Jaya, Malaysia. The schools where the respondents studied had similarities such as, they are urban schools, academic-oriented, comparable in educational programs and facilities, and classified as Grade A school. The respondents comprised of 181 boys and 216 girls. Among the boys, there were 22.2% from the high socioeconomic status and 23.4% from the low socioeconomic status. Among the girls, there were 24.9% from the high socioeconomic status and 29.5% from the low socioeconomic status.

Yong administered six instruments to gather data. One of the instruments used in Yong's study was the Torrance Tests of Creative Thinking to look into the figural creativity and verbal creativity of the form four pupils. The creativity score of each activity was based on four elements that were fluency, originality, flexibility, and elaboration. Yong had the instructions in the Torrance Test of Creative Thinking translated into Bahasa Melayu and pilot testing was carried out. Test-retest reliability of both of the figural and verbal creativity test was found to be reliable and valid. According to Yong, these instruments were reliable and able to obtain stable responses from the participants.

Another instrument used in Yong's study is Your Style of Learning and Thinking. The instrument was used for classifying the respondents according to hemisphericity or style of processing information. The Your Style of Learning and Thinking instrument was translated into Bahasa Melayu in the same procedure as the Torrance Test of Creative Thinking. A pilot study was carried out and Yong used Pearson product moment correlation to analyse the rest-retest data. The coefficient of the test-retest was .85, hence according to Yong, the Your Style of Learning and Thinking instrument is considered to be reliable and able to obtain a stable measure of the learning style of the respondents.

A demographic questionnaire was designed by Yong to obtain information regarding gender, socioeconomic status, and home-environment of the pupils. According to Yong, the father's occupation has been found to be the best index of the family's socioeconomic status. Yong categorized his respondents into two categories of socioeconomic status, namely low socioeconomic status and high socioeconomic status.

Yong and his team of researcher administered the data collection in a sequential order. The Figural form A, Torrance Test of Creativity Thinking was conducted first followed by the demographic questionnaire. In the following session, the Your Style of Learning and Thinking test was conducted followed by Verbal form A, Torrance Test of Creativity Thinking. The other instruments were the Longeit's Reasoning Test to obtain measures of the cognitive level of the subjects, the modified version of Brookover's Self Concept of Ability Scale to obtain measures of the student's academic self-concept, and the Cattel Culture Fair Intelligence Test to obtain a measure of the IQ of the pupils were conducted in session three. According to Yong, the sessions were conducted separately in order to minimise test fatigue.

Yong used descriptive statistic to analyse the component abilities of figural creativity. The pattern of performance found in Yong's study follows the following sequence - elaboration > originality > fluency > flexibility which means that elaboration had the highest mean score and the lowest mean score is flexibility. The mean score for figural creativity is $M = 199.88$. The mean scores for the components of figural creativity showed the following results. The mean score for figural originality was 33.03, figural elaboration was 69.64, figural fluency was 22.69, and figural flexibility was 16.52. According to Yong, the pattern of performance is comparable to that reported in the norms and technical manual of the Torrance Test of Creative Thinking, 1974, based on Torrance's studies of American pupils of a similar age. Correlation analysis and multiple regression analysis of the data showed that all the four components of figural creativity are found to be significantly correlated to one another. Figural fluency, flexibility, and originality are highly correlated but they are not highly correlated with figural elaboration. Yong also found that verbal creativity and figural creativity are correlated significantly but the correlation is not high. This implies that pupils who are highly creative in figural creativity may not be highly creative in verbal creativity and vice versa. The best predictor for overall creativity in Yong's study is figural originality and verbal fluency. Verbal originality is the last predictor of overall creativity. According to Yong, the finding suggested that even though creative Malaysian pupils possess ideational originality, they are reluctant to verbalize their ideas due to fear of not able to conform to the expectation of their parents or teachers. Yong also stated that Malaysian pupils who are creative are able to produce ideas that are away from the obvious or the commonplace by using figures. Both figural flexibility and verbal flexibility are not important predictors of overall creativity. Yong noted that this is not a surprising finding in the Malaysian context. Malaysian teachers and educators have commented from their observation that pupils in schools are generally rigid in their thinking. Rote-learning and memorising factual information has been a common practise in Malaysia education system because the goal of schooling is on passing fact-oriented national examinations.

Yong also looked into the relationships between creativity and the independent variables of sex, intelligence, self-concept, cognitive levels, academic achievement, learning style, socioeconomic status, home-environment and parental influence. Study on the form four pupils found that boys are more significantly creative than girls. The figural creativity mean score for boys (*M* = 207.68) is higher that the girls (*M* = 193.35). Gender is the most significant predictor for overall creativity and figural creativity.

According to Yong, generally creativity is not encouraged in girls in the Malaysian society as compared to the boys. These social norms which encourage boys' roles to be expressive and innovative could be the reason why boys are more creative than girls. In Yong's study, cognitive levels were significant effects of verbal creativity but not significant effects for figural creativity and overall creativity. However, academic achievement was found to be significantly related to overall creativity, figural creativity and verbal creativity. Academic achievement was significantly correlated to figural elaboration but not significantly related to figural originality, figural flexibility, and figural fluency.

The results of the correlation analysis of learning style showed that left hemisphericity, right hemisphericity and the integrated learning styles were not significantly correlated with overall creativity, figural creativity and verbal creativity. The right hemisphere and integrated learning style are not related to creativity. Yong's explanation for the finding was that the present sample comprising of 16 years old may be too young to exhibit a stable learning style. Yong also found that socioeconomic status is not significantly related to creativity. It is not found to be a significant predictor of creativity. This shows that, according to Yong, socioeconomic status has no effect on the creativity of the pupils in the Malaysian context. This is because the usual aspiration of the majority of parents, irrespective of their socioeconomic background, aspires their children to study hard and perform well in the public examinations.

What is the view that could be emulated from Yong's study? First, the Torrance Test of Creative Thinking instrument proved to be a reliable and valid instrument to measure creativity for Malaysian pupils. Second, Yong suggested that Malaysian pupils who are creative are able to produce uncommon ideas using figures; hence the Figural Form A of Torrance Test of Creative Thinking could be a suitable instrument. Third, Yong's study indicated that boys are more creative than girls due to social norms that differentiate the role of male and female. It also found that socioeconomic status had no significant effect on creativity because of the target set by the majority of parents. Yong's study was conducted over 20 years ago. A more recent research is needed because changes in curricula and sociological factors might influence their relationship with creativity.

Chia (1998) conducted a study on the effectiveness of creative problem solving toward creativity of teacher trainees in Malaysia. It was found that creativity is associated but not synonymous with intelligence. The results of the investigation showed that creative problem solving training is effective in enhancing the creativity of the female teacher trainees. However, it was also stated that creative problem solving training did not significantly improve the creativity of the high IQ-low creativity, high creativity-low IQ, and the low IQ-low creativity teacher trainees.

A study to investigate the dimensions of creativity in primary school students in Malaysia was conducted by Siti Rafiah (2008). Siti Rafiah (2008) examined the nature of creativity among Year Five pupils in a public school in Malaysia. She carried out a survey of 131 pupils. The rational for carrying out the study is because literature review has shown that few studies have been done on children's creativity in Malaysia. Siti Rafiah further stated that creativity is the main concern of educators in Malaysia. Creativity has been integrated into the primary school syllabus and also the secondary school syllabus since 1980. However, the success of the implication in the area of creativity has not been explored.

Siti Rafiah employed a quantitative approach to examine children's creativity in the Process, Person, Press, and Product dimensions. She used the Torrance Test of

Creative Thinking Figural Form A and Verbal Form A to gauge the Process dimension. The Personality Questionnaire Form A was used to gauge Person or personality attributes. The Biographical Questionnaire was used to gauge Press or creative environment. The Product dimension was the Collage-making activity. Siti Rafiah investigated the nature of creativity of Year Five pupils using descriptive statistics. The consensual assessment technique was used to analyse the Product dimension. Siti Rafiah also compared gender differences, high and low figural groups, high and low verbal groups using inferential statistics. The relationships between Process and Person, Press and Product were carried out. Siti Rafiah found that creativity exist in Year Five pupils in public school in Malaysia. The creativity Process is related to Person, Press, and Product. Siti Rafiah stated that the inclusion and integration of creativity in the Primary School Integrated Curriculum have succeeded.

Recently, Singh (2011) investigated the relationship between figural creativity and academic achievement of form four students in several secondary schools in Kuala Lumpur. Torrance Test of Creativity Thinking was used as the instrument to measure creativity. As for the academic results, marks from the year end exam of Malay Language, English Language, Science, Mathematics, and History were converted to standard scores and analysed. Singh conducted his study on 300 form four students randomly selected from four administration zones by the State Education Department. Sixty respondents were selected from each school. The mean age of the respondents was 16.2 (*SD*=0.52). Singh found that form four students are more creative in figural fluency, followed by figural flexibility, figural originality, and figural elaboration.

According to Singh the findings show that form four students in Malaysia are able to produce various ideas when their mind are stimulated to think. Hence, teachers are encouraged to stimulate their students' thinking by giving challenging questions and activities. Singh compared the findings of his study with the study by Stephens, Karnes and Whonton conducted in South America in the year 2001. Stephens, Karnes, and Whonton reported that students in South America are more creative in figural originality, followed by figural fluency and figural elaboration. Singh further commented that the difference in findings could be influenced by the culture and education system background of the country. However, the study by Stephens, Karnes, and Whonton was conducted ten years before the study of Singh. Comparing the results from studies of large gaps of time may not be so valid because of the global changes and demand of the country.

In conclusion, the literature reviewed above indicated that general creativity is normally measured in terms of fluency, originality, elaboration, resistance to premature closure, and abstractness of title. Besides that, the Torrance Test of Creative Thinking is a popular instrument used to measure figural creativity. It is not only used in correlation studies but also in other research design. It can be said that, The Torrance Test of Creative Thinking is the most widely used measures of creativity in this genre. Furthermore, the Torrance Test of Creative Thinking has demonstrated that it can discriminate between individual creativity and to show acceptable levels of test-retest reliability (Hennessey, 2010). The component of creativity measured by most of the researchers follows the component stated by Torrance. Thus in this study, Torrance Test of Creative Thinking is used.

2.7 Relationship between Musical Creativity and General Creativity

Few studies in the creativity literature focus on the relationship between general creativity and musical creativity. However, neither of these studies was carried out in the Malaysian context. These studies have limitation because creativity findings in the west may not necessarily apply to other parts of the world due to cultural and environmental differences.

In the 70s and 80s, research in the west compared general creativity and musical creativity had produced mixed results. Vaughan (1977) as cited in Auh (2001) found that the results between general creativity and musical creativity conflicting in his five studies conducted in 1970, 1971, 1972, 1974 and 1976. Vaughan found no significant relationship between general creativity and musical creativity in four of his five studies. However, a significant relationship between the musical creativity and general creativity was found in his study conducted in 1971.

Ten years later, Vold (1986) conducted a study of musical problem solving behaviour in kindergarten children and he made a comparison of musical problem solving behaviour with other aspects of creative behaviour. The purpose of Vold's study is to develop a Measure of Musical Problem Solving instrument which can assess (1) divergent thinking (fluency and flexibility) with common classroom musical instruments, (2) relating sound to feeling-states, and (3) convergent thinking with musical ideas. One of Vold's research questions is to examine whether there is a significant relationship between scores in musical creativity, movement creativity, and general classroom creativity in kindergarten children.

The sample of Vold's study consisted of 30 kindergarten males and females from a public elementary school. They were selected by four teachers according to particular characteristic set by Vold. The samples were given the Measure of Musical Problem Solving task individually and each session is approximately 30 minutes. There were three sections in the Measure of Musical Problem Solving. The first section encourages each child to find as many ways as he/she could to produce sounds on six familiar instruments. The divergent score that is musical fluency and musical flexibility were attained from the task. The second section measures the child's ability to create sounds that are related to feeling. The third section measures convergent thinking. The child was asked to create as many ostinatos as he/she could, by using a set of pentatonic song bells. The scores of the Measure of Musical Problem Solving were compared to Torrance's Thinking Creatively in Action and Movement scores.

The Thinking Creatively in Action and Movement contained four sections. The first section measures fluency and originality by requiring the child to think of as many ways as he or she could to move from one spot on the floor to a spot 20 feet across the room. The fluency score was the number of different ways to move that the child could either describe or demonstrate. The originality score was determined by referring to the originality criteria list provided in the test package. The originality values ranged from one to three for each response on the list and were based primarily upon the statistical infrequency of the response in a normative sample of 500 children.

The second section of Torrance's Thinking Creatively in Action and Movement measures imagination by requiring the child to pretend to be various objects or animals. Points were awarded according to the degree of vividness of the portrayal by each child. The third section measures fluency and originality by requiring the child to think of as many ways as he or she could to get a paper cup into a wastebasket placed nearby. The fluency score was determined simply by counting the number of ways the child could either describe or demonstrate. The originality score was determined by comparing each response to the items on the originality reference list provided in the test package. The fourth section measures fluency and originality. The fluency score is the number of different uses for a paper cup the child could imagine. The originality score was determined by referring to the originality criteria list provided in the test package. All the four sections added up to determine the composite score of Torrance's Thinking Creatively in Action and Movement.

Vold found strong relationships between the Measure of Musical Problem Solving and the Thinking Creatively in Action and Movement. The strongest positive relationships between the two measures were Musical Fluency and Action Fluency, Musical Flexibility and Action Fluency, and Musical Fluency and Action Originality. The weakest positive relationships between the two measures were Musical Convergence and Action Fluency, Musical Convergence and Action Originality, and Musical Convergence and Action Imagination. Vold also found that the mean score of each component of the Measure of Musical Problem Solving and the Thinking Creatively in Action and Movement decrease as the general creative ability rank by the teacher decreases. However, there is no significant difference found in the one-way analysis of variance. Other than the above findings, Vold also found that there were differences in the score of Measure of Musical Problem Solving and Thinking Creatively in Action and Movement among the Above Average, Average, and Below Average classroom creativity groups.

Vold in his discussion chapter stated that the data gathered from his study supports the idea that a measure of musical problem solving ability in young children can be constructed. The components measuring musical fluency and musical flexibility showed high reliability. However, the study was conducted to kindergarten children of a small sample size and the samples were not randomly selected. Vold recommended a much larger stratified sample in further studies.

Eight years after Vold's study, Squeglia (1994) conducted a study on the effect of creative musical activities on general creativity, musical creativity, higher level thinking and self-concept of fifth grade students. Torrance Test of Creative Thinking Figural A and B, Test of Musical Creativity by Vaughan, Primary Test of Higher Processes of Thinking by William, and The Personal Attribute Inventory for Children by Parrish and Taylor were used.

Squeglia stated in her literature review that there were many findings that supported that music study has a positive effect on general creativity. Squeglia stated that Simpson (1969), Leibowitz (1978), and Wolff (1979) agreed that music study has a positive effect on general creativity and creativity can be cultivated through music activities. Squeglia also stated that Tarratus (1964) found musical creativity to be significantly related to general creativity. Vaughan and Vold also support the theory that general creativity is significantly related to musical creativity.

There were 20 fifth graders from a Middle School participated in Squeglia's study. The samples were randomly selected. Torrance Test of Creative Thinking, the Primary Test of Higher Processes of Thinking, and the Personal Attribute Inventory for Children were administered in a group setting. The Vaughan Test of Musical Creativity was conducted individually. The fifth grades were introduced to Orff media, theory, and technique. They were engaged in critical and creative thinking and wrote both a script and original music for a stage production on the topic of environmental issues. The music written was played on Orff and percussion instruments.

Squelia found that there is a significant difference in the pre-test and post test result of all three factors of musical creativity that is fluency, rhythmic security, and ideation from the Vaughan Test of Musical Creativity. However in her study there was no significant difference in general creativity in the fours factors of fluency, elaboration, resistance to premature closure and abstractness of titles in the pre-test and post test score, but there was a slight gain in the post test results compared to the pre-test. The figural originality score did gain but not record slight loss.

The findings of Squeglia supported the theory that creative function can be systematically developed over a period of time by participating in a program of creative activities.

The findings of Vaughan (1971) support the theory that general creativity is significantly related to musical creativity and musical ability is a good predictor of musical creativity. However, Vaughan also stated that in his study, though musical ability and musical creativity are related, they are really separate talents.

In conclusion, though the literature review stated that many studies show musical creativity is related to general creativity, a close inspection by Webster (1977) in his study found that general creativity is related to the creative skills of improvisation and analysis but not to the skill of composition. The inconsistent findings, which are mostly based on non-Malaysia samples, indicate that further investigations are necessary to arrive at a more conclusive finding pertinent to the Malaysian educational environment.

2.8 Musical Exposures

This section describes some information on related studies in the aspects of musical activity involvement, aural discrimination, and self-esteem of musical ability.

2.8.1 Musical Activity Involvement

The participation in musical activities in school may have considerable influence on his or her academic achievement. Kinney (2008) conducted a study on selected demographic variables, school music participation, and achievement test scores of Urban Middle school students. Two schools identified as "in need of improvement" (p. 147) were chosen purposefully based on their similarities in demographic and test score data of the participants. Both of these schools offered elective music courses in choir and band in 6th and 8th grades. In total there were 273 participants in the 6th grade cohort and 215 participants in the 8th grade cohort.

The participants in the 6th grade consisted of 45.4% male and 54.6% female students. In terms of ethnicity, there were 71.8% White, 19.4% African, 1.5% Hispanic, and 7.3% Multiracial. Out of 273 participants in 6th grade, 50 students participated in band, 41 participated in choir, and 182 nonparticipants in music activities.

As for the participants in the 8th grade, it consisted of 51.6% male and 48.4% female students. In terms of ethnicity, there were 67.9% White, 23.7% African, 0.5% Hispanic, 0.7% Indian, and 7.2% Multiracial. Out of 215 participants in 6th grade, 38 students participated in band, 19 participated in choir, and 158 nonparticipants in music activities.

The MANOVA analysis for 6th and 8th grade revealed significant main-effect differences in participation in music with test scores of Reading, Math, Science, and Citizenship. Results from the study also found that students participating in band scored significantly higher than those in choir or not participating in music. Kinney reported that his findings are similar to findings from previous study.

However, Kinney found that students who participated in the choir did not show similar trends. Comparisons of choir participants with nonparticipants revealed no significant differences in any of the subtest for either cohort. Kinney reported that the choir students were not higher achievers compared to the band students. Kinney concluded in his discussion section that serious consideration should be given to the findings of the study. The policy makers, administrators, and teachers who are involved in structuring curricular needs to plan a curriculum that provide a well-rounded education for all.

Deisler (2011) conducted a study on the characteristics that influences the success of high quality band programs in schools. The subjects in his study consisted of students from high socioeconomic status and low socioeconomic status. The perceptions of the causes of the success of the band program were examined. Deisler also investigated the relationships between the perceptions among the participants of both statuses. In Deisler's review of literature, he stated that students "living in poverty are academically disadvantaged when compared to higher-income or higher socioeconomic level peers" (p. 3). He further reviewed that the gap in academic achievement between high socioeconomic status and low socioeconomic status can be seen from kindergarten and the gap became wider as they progressed through school.

There have been many studies that have attempted to identify relationships between involvement in musical activities and academic achievements. Streb (2009) conducted a study to look at the academic achievement of students who were involved in co-curricular activities. The academic achievement scores were from the American College Test (ACT) score and Grade Point Average (GPA).

The participants of the study consisted of 492 graduating high school seniors. The students were divided into categories consisting of athletics, fine arts, and service or academic focus or leadership clubs. The GPA, ACT score, and student's record of co-curricular participation was obtained through the school's counselling department. It was found that there were differences on academic success measures of GPA and ACT scores by participating in co-curricular activities versus non-participation in co-curricular activities. The students who participated in a co-curricular activity had a significantly higher ACT score than those who did not participate in a co-curricular activity. It was also found that students who participated in fine arts as a co-curricular activity had significantly higher GPAs than those who participated in athletics as a co-curricular activity and those who participated in service or academic leadership or a co-curricular activity.

In another study, Davenport (2010), conducted a study to investigate the effects of participation in school instrumental music programs on student academic achievement and school attendance. Davenport did not look into gender, ethnicity, or socioeconomic status. His study only concentrated on participants from three middle schools and three high schools. Davenport gathered data on the Maryland School Assessment and Maryland High School Assessment scores.

It was found that there were statistically significant differences among the high school students enrolled in an instrumental music class and those that were not enrolled in an instrumental music class on the English and algebra sections of the High school Assessment. Davenport stated that the findings of the study suggest that high school students who participate in a school sponsored instrumental music program have higher academic achievement than high school students that do not participate in a school sponsored instrumental music program. However, the results from the middle school statistically showed no significant differences among the students from the three middle schools that were enrolled in an instrumental music class and the middle school students that were not enrolled in an instrumental music class on the reading and mathematics sections of the Maryland School Assessment. But the difference in mean test scores, though not significant, showed that students that were enrolled in an instrumental music class did have higher scores on the Maryland School Assessment than those students that were not enrolled in an instrumental music class.

The lack of difference according to Davenport could have been caused by the program structure where all middle school students were required to complete at least one fine arts class during middle school. The participation in any fine arts program has some effect on academic achievement.

In a more recent study, Thomas (2011) studied the impact of musical performing arts on the academic achievement of black males in the United States. In his quantitative study, 112 Black males in eighth grade were divided into subjects that participated in musical performing arts ensembles such as band, orchestra, or chorus, and subjects who did not participate in these groups. A purposive sampling was used in order to focus the study on a particular group. The relationship between academic achievement and music participation were investigated using regression analysis and *t*-tests. Academic achievement data were obtained from mathematics and English language arts programs. Thomas found that there was a strong relationship between participation in musical performing arts ensembles and academic achievement. However, statistically there was no significant difference between participation in instrumental ensembles with math and English language arts achievement score.

The above reviews of studies on musical exposures in co-curricular activities have shown that the involvement in musical activities influences academic achievement. However, there is a lack of literature concerning the influence of musical exposures on other aspects such as musical creativity and general creativity among university graduates or trainee teachers.

2.8.2 Aural Discrimination

Since the early 1960s, researchers and music educators have begun to find a suitable instrument to measure aural discrimination skills which are named as the Music Achievement Test. Various instruments were designed and tested. White (1961) reported about an instrument named Aliferis Musical Achievement Test. Aliferis Musical Achievement Test was designed to measure the auditory-visual discrimination. Auditory-visual discrimination is an indispensable ability for musician according to White. The ability to see with the ears and hear with the eyes is a recognized competence all musicians should have.

Colwell and Rundell (1965) reported on another instrument that measures auditory-visual discrimination. The Knuth Tests of Musical Achievement developed in 1936 measures auditory-visual discrimination of melodic and rhythmic items. Colwell and Rundell used Knuth Tests of Musical Achievement in their study on the effects of ukulele and piano keyboard experiences in general music classes.

Later, in 1968, Richard Colwell presented a paper in the International Seminar on Experimental Research in Music Education, at the University of Reading, in

England. In his paper, Colwell (1970) acknowledged that the Knuth Achievement Test in Music and the Farnum Music Notation Test were good. However, he opined that the Elementary Music Achievement Test (EMAT) is a better test, because the EMAT is very well constructed and it is a very practical instrument to use to measure the real musical outcomes of aural discrimination skills (Bailey, 1969). The EMAT has two tests namely Test 1 and Test 2. In Test 1 there are three subtests. Subtest measures pitch discrimination, subtest 2 measures interval discrimination, and meter discrimination is measured in subtest 3. Test 2 presents the student with musical situations much more so than does Test 1. In Test 2, there are two subtests. Subtest 1 measures the ability to detect errors in pitch notation. Subtest 2 requires students to indicate his feeling for the tonal centre by indicating the three tones in a key tone for a chordal passage or phrase of a melody which is heard. Colwell standardized the EMAT by using 8,590 respondents from 43 communities in 29 states. The reliability was .88 for Test 1 (N = 7,710; SD = 10.41), .94 for Test 2 (N = 7,894; SD = 18.94), and .95 for the combined tests.

Other than the above instruments used to measure musical achievement, Edwin Gordon developed Musical Aptitude Profile, and Arnold Bentley developed Measures of Musical Abilities (Young, 1976). However, Musical Aptitude Profile and Measures of Musical Abilities are designed to help identify children with greater and lesser potential. As for the Music Achievement Test by Richard Colwell, and the Iowa Tests of Music Literacy (ITML) by Edwin Gordon are used to measure the direct results of teaching.

Hedden (1982) examined predictors of music achievement for general music students in the upper elementary grades. The predictors examined were attitude toward music, self-concept in music, music background, academic achievement, and gender. Hedden conducted his study on fifth and sixth grade students from two schools. The instruments used to collect data were Music Achievement Test, Level One by Colwell (1970) for musical achievement, Iowa Tests of Basic Skills for general achievement, Attitude toward Music Scale for music attitude, Self-Concept in Music scale by Svengalis for self-concept, and Music Background questionnaire. The data collected were analysed using mean score, standard deviations, analysis of variance, zero-order bivariate correlation coefficients, and stepwise multiple regressions.

Hedden found that for both schools, academic achievement measure is the best single predictor of musical achievement. Hedden also found that self-esteem and positive attitudes towards music as significant predictors of musical achievement. Though gender is also listed as one of the predictor of music achievement, the influence is weak. However, the study did not clearly state the method used to select the subjects. The reasons for the selection of the two schools were not justified. The music achievement was not investigated

The Musical Achievement Test by Colwell is also used in more recent studies. Gwan (2011) conducted a true-experimental study to examine the effects of an after-school music program on music underachievers' aural discrimination skills, social development, and self-esteem. The subjects of Gwan's study were sixty-six fifth-grade students randomly selected from the lowest quartile of scores on Colwell's Musical Achievement Test. Gwan administered Musical Achievement Test to 494 students in three Korean elementary schools. The students were divided into an experimental group and control group. The experimental group was given 14 hours of treatment time. The treatment was an after school music program taught by the researcher which consisted of various movements and musical activities based on Kodaly, Orff, and Dalcroze pedagogies. A post test was administered at the end of the program to the experimental group and also the control group. It was found that there was a significant difference in the musical achievement total scores of the Musical Achievement Test. The experimental group scored higher than the control group. Gwan concluded that a movement-based after-school music program promotes music underachievers' musical growth and may also support musical underachievers' social development and self-esteem.

Other than the above studies, there are other researches that used Colwell's Musical Achievement Test in their studies to measure aural discrimination skills. The researchers are Auh (1995), Dodson (1980); Wig & Boyle (1982), Young (1976), and Zdzinski (1993). Considering the vast used in Musical Achievement Test by Colwell in research concerning aural discrimination, this test is adapted in the present study to determine the trainee teachers' aural discrimination skills.

2.8.3 Self-esteem of Musical Ability

Self-esteem is defined as good opinion of oneself in the Oxford Dictionaries (2013). Self-esteem according to Coopersmith (1981) is defined as a personal judgement of worthiness that is expressed in the attitudes the individual holds toward himself. The level of self-esteem varies in direction and intensity, depending upon the success, aspiration, sex, and ability. Schmitt (1979) refers to the self-esteem of musical ability as the personal estimation of an individual towards his capacity to perform musical tasks and attain musical competence.

Schmitt (1979) developed and tested a measure of Self-Esteem of Music Ability to 487 children of 10 to 15 years of age. The measure consists of a series of questionnaire about current and future behaviours that are associated with level of music ability. Questions regarding behaviour of parents, teachers and friends towards the perceptions of musical ability of the children are included. The most significant finding in Schmitt's study is that there is a positive relationship between involvement in music activities and self-esteem of musical ability.

Austin (1990) conducted a study on the relationship of music self-esteem to music activity participation among upper elementary students. The Self-Esteem of Music Ability scale (SEMA) was utilized as a measure of music self-esteem. SEMA used was adapted from Schmitt (1979) and students were asked to respond to a series of statements describing their perceived musical ability. For each statement, students indicated their level of agreement or disagreement in a 4 Likert scale, and summed to yield a profile score ranging between 43 and 172. The test retest reliability of the SEMA was reported as .91 in the study. The study demonstrated that the SEMA can be utilized to reliably assess music self-esteem as a subject-specific construct. It was found that female students (M = 119.32) possessed significantly higher levels of music self-esteem than the male students (M = 110.87). The SEMA scores also proved to be a significant predictor of participation in both school and out-of-school music activities.

Schmidt (2005) conducted a study to re-examine academic achievement motivation orientations of band students in four school districts. The academic achievement motivation orientation was within the context of instrumental music. Schmidt also examined the relations among achievement motivation orientations, self-concept in instrumental music, and attitude towards band practice. Schmidt reviewed a few literatures concerning self-concept and stated that students who persisted in instrumental music had been found to have higher self-esteem when compared to the dropouts. However, there were studies that found self-esteem did not predict performance achievement. There were 300 Grade 7 to 12 students participated in the study. There were 131 male students and 169 female students. The students have been playing a band instrument for at least two years. Schmidt conducted a survey to gather data. An adapted Asmus and Harrison measure was used to gather information concerning self-concept in instrumental music. The maximum point in the self-concept scale was 20. Schmidt found that students generally had a relatively strong musical self-concept (M = 14.54). The study found that self-concept had a moderate positive correlation with mastery, intrinsic, and individual orientations.

A year later, Schmidt, Zdzinski, and Ballard (2006) conducted a study to examine motivation orientations and musical self-concept in relation to measures of academic achievement and career goals of pre service music teachers. Participants were 128 undergraduate music educations major from three American universities. There were 72 males and 76 females. A survey instrument was developed to gather information concerning academic major, current class level, major performance medium, gender, current grade point average, and SAT scores. The self-concept data were gathered using a 10-item scale defining self-concept in music adapted from Asmus and Harrison and Vispoel measures.

The study found that there were no correlation between self-concept and academic achievement. There was also no correlation between musical self-concept and motivation variables such as intrinsic, mastery, and cooperative orientations. The findings in the study contrasted with Schmidt's (2005) results. According to Schmidt, Zdzinski, and Ballard (2006), the difference in the results may be due to differences in maturation, metacognition, and self-awareness between the populations. Schmidt's study in 2005 was on secondary instrumental music students.

In a study to examine the relationships between musical achievement, musical self-esteem, and music aptitude, Draves (2008) conducted a study of 20 undergraduate non-music majors in a songwriting course. The participant of the study wrote seven original songs throughout the semester. The self-esteem data were collected using Self-Esteem of Musical Ability questionnaire. Draves reported that no statements were deleted from the Self-Esteem of Musical Ability questionnaire; however, some statements were changed to make them applicable to university students. It was found that self-esteem of personal desire and interest are significantly related to musical achievement in the aspect of performance and construction of the composition. Draves suggested that a larger sample size is needed for further research.

The Self-esteem of Musical Ability instrument is used in a study conducted by Randles (2010) to examine the relationship of compositional experiences of high school instrumentalist to music self-concept. Randles administered the Self-esteem of Musical Ability questionnaire to 77 high school band students in a moderate-sized suburban school district. All participants were members of a single high school band. For over 12 weeks, the participant of the study composed music on the computer using the Garageband program. Randles found that self-esteem significantly correlates with grade level, compositional experiences, school music activity, home music activity, satisfaction of school music experiences, and perception of personal contribution to learning in the school music setting. It was also found that the strongest predictor of music self-concept is compositional experiences.

A comparison study was carried out by Brand (2004) to compare levels of self-esteem of 141 music education majors from America, Australia, and China. The Self-Description Questionnaire III (SDQ) by Marsh, 1988 was used to measure the multiple dimensions of self-concept of late adolescents. The questionnaire contains 136 items, measuring 13 facets of self-concept based on the hierarchical model of self-concept and a general self-esteem scale derived from Rosenberg (1986) cited Brand (2004). The sample consisted of 67 students from Republic of China, 37 from United States and 37 from Sydney, Australia. These three groups were similar in profile for age and number of years in college. The findings indicate that the Chinese students showed lower self-esteem score (M = 64.63) than the American (M = 73.32) or Australian (M = 71.89). Female students obtained higher self-esteem than the male students, in the overall result, however, only the American male and female self-esteem scores differ significantly.

In conclusion, from the review of literature above, there appears to be some empirical evidence showing that the Self-esteem of Musical Ability instrument developed by Schmitt (1979) was used widely by many researchers to measure student's self-esteem of musical ability for the past 30 years. The above literature also shows that self-esteem of musical ability though seems to be an important factor in one's daily life; it does not have a consistent positive relationship with achievement. However, the discussion above concerns literature outside the local context. Thus, the present study hopes to fill the gap in the literature concerning self-esteem of musical ability.

2.9 Influence of Personal Variables on Creativity

The review of literature reveals that personal variables such as age, gender, ethnicity, academic years, and socioeconomic status influences creativity. However, the research findings of these relationships were rather inconsistent whether they are or are not related to creativity. Here are a few studies to support the literature of inconsistent findings between creativity and personal variables.

In the first study, Kiehn (2000) noted in his study that researches of musical creativity and various individual difference variables revealed no clear relationships. The goal of his study is to address and clarify the inconsistent findings of previous creativity research. Kiehn investigated two areas concerning personal factors, and attempted to answer the following research questions: (a) Are there significant gender or grade level differences for music creativity score in the Vaughan Test of Musical Creativity?, and (b) Are there significant gender or grade level differences in figural creativity score on the Torrance Tests of Creative Thinking?

The samples in Kiehn's study were students from three elementary schools within a large Colorado school district. The samples were randomly selected from a total population of 858 students. Six girls and six boys each from grade 2, 4, and 6, were selected from each school. The total participants in Kiehn's study were 89 students.

Kiehn found that the mean score of male students was significantly higher than the mean score of females in the Vaughan Test of Musical Creativity. Kiehn commented that "perhaps male students simply function more creatively with respect to fluency and originality." Kiehn also found that there is a plateau in musical creativity between grade four and grade six students. The mean music creativity score for grade two students (26.15) was significantly lower than that of students in grade four (29.36) and grade six (29.98). However, the mean score for grade four and grade six students was not significant. Because of the finding, Kiehn concluded from his study that elementary male students are more creative than female students, and there is no parallel progression of music creativity to grade level.

The findings of Kiehn's study were on elementary students. The generalizability of the findings is limited to the subjects of the same age. Nevertheless, Yong (1993, 1994) also found that male students in the form four levels in Malaysia were more creative than the female students. Yong conducted a study to investigate creative abilities of Malaysian secondary students. He stated that boys are found to be more figural and verbally creative in the Torrance Test of Creative Thinking compare to girls. The multiple regressions yielded gender as the foremost significant predictor for overall creativity and figural creativity. Gender is the second most important predictor for the verbal creativity. Yong's survey approach comprised of 181 boys and 216 girls in schools located in the urban and suburban areas of Kuala Lumpur and Petaling Jaya.

A study by Singh (2011) supports the finding by Yong (1993, 1994). Singh found that there is a significant difference in the creativity results between male and female form four students in secondary schools in Malaysia. From the *t* –test, it was found that male students had higher figural fluency and figural elaboration than female students. However, female students had higher figural originality than male students.

Though the above findings support the statement that male is more creative than female, the findings of Charyton's study (Charyton, 2005; Charyton & Snelbecker, 2007) states otherwise.

Charyton (2005) conducted a study to compare male and female in their artistic and scientific creativity among engineering and music college students. Charyton's study contained four research questions. Her last research question attempted to investigate to what extent is the demographic characteristic of gender, ethnicity, and age related to different levels of general, artistic, and scientific creativity.

The sample of Charyton's study consisted of 100 music students and 105 engineering students from a university who volunteered to participate in the study. The age of the participants ranged from 18 to 31 years old. There were 50 female and 50 male participants of music students, and 87 male and 18 female participants of engineering students. The majority of ethnicity for music major students was Caucasian. The instrument used to measure musical creativity was the Harmonic Improvisation Readiness Record. Harmonic Improvisation Readiness Record is a paper and pencil test designed by Dr Edwin Gordon (Gordon, 1998) to determine a student's ability to audiate harmonic patterns and predict a student's potential to improvise harmonically. There were 43 pairs of harmonic items performed in various tonalities in the test. Students were required to answer on a standardized answer sheet by circle to indicate whether the two samples in each item were the same, not the same or unsure.

Charyton found that there were no significant differences for gender differences among music majors and engineering majors in general, scientific, and artistic creativity. Charyton stated that her findings support the literature by Csikszentmihalyi, 1996 and Torrance 1995 that when a person is more creative, they tend to be androgynous.

However, the samples of Charyton's study were not randomly selected. The participants voluntarily to be respondents. Nevertheless, the participants of her study were college students; hence the findings that gender has no relationship with artistic creativity further support the inconsistent findings on this matter. The finding is also supported by Baltzer (1988). Baltzer stated in his study that there is no significant difference between the responses of males and females in any of the activities.

Many factors could have influenced the findings in the above studies. Cultural influences, the sample used, sample's age, the environment of the sample, and the creativity measurement used. These inconsistent findings show that further investigation is needed in order to arrive at a more conclusive findings pertaining to the Malaysian education environment.

Other than research on participants from the western countries, studies on other ethnicity concerning creativity were carried out too. Niu (2003) carried out a study on Chinese students to look at how individual and environment play decisive roles in the students' creativity.

The influences of both individual and environmental factors on student creative performance in the Chinese context were investigated. Niu based her study on Sternberg and Lubart's investment theory of creativity, in which according to Niu has six distinctive resources. The resources are intelligence, personality, motivation, thinking styles, knowledge, and environment. Niu categorised the individual factors as intelligence, personality, and motivation. The social-environmental factors are family and school. The sample consisted of 357 Chinese high school students. Niu used self-report questionnaires and psychometric tests to investigate how both individual and social-environmental factors could predict student creativity in the art and language domains and their general creativity thinking. A second study was conducted by Niu on 180 Chinese high school students to examine the effects of prompting and coaching students to be creative on their creative performance in the domains of art and literature.

Niu found that individual and social environment factors significantly predict creativity. Intelligence is the single most important predictor of creativity. When the factor of intelligence is controlled, the variance of social environment is as much as the combination of intelligence and environment factors. Hence, Niu concluded that both individual and environmental variables can be independently effective in affecting an individual's creativity.

The limitation of Niu's study is, the sample is Chinese students of Chinese culture, thus any generalization of these results can only be made with caution.

Other than studies on Chinese ethnicity, Gan (1998) conducted a study in a multicultural country. Female students from a university in Malaysia were the participants of her study. Gan studied on the creativity and creative perception among bachelor of education students. She also investigated the influence of intelligence and socioeconomic status on creativity and creative perceptions. The subjects in Gan's study were 77 first year Bachelor of Education students of the University of Malaya. These students were in training to be English teachers in Malaysian secondary schools. The mean age was 24.60 years. There were 34 (44.2%) high socioeconomic status students and 43 (55.8%) low socioeconomic status students.

In her findings, Gan suggested that there is a need to have more concerted effort to enhance creativity among students especially the low socioeconomic status students. It was found that high socioeconomic status students have a significantly higher level of verbal originality as measured by Onomatopoeia and Images, and a significantly higher level of creative perception as measured by Something About Myself compared to low socioeconomic status students. Gan found that there is no significant difference on students' creative perception and verbal originality with intelligence.

The influence of parents towards children's creativity was investigated by Yong (1994). In the one-way analysis of variance for father's influence and mother's influence by IQ-creativity groups, it was found that there is no significant difference in parents influence with creativity. Yong concluded that in the Malaysian context, socioeconomic status has no effect on the creativity of the students. Yong further added that the findings did not support the notion that an "affluent background plays an important role in the nurturing of creative potentials" (p. 177). This could be due to the aspiration of the majority of parents that their children should study hard and perform well in public examinations irrespective of socioeconomic background.

Webster (1979) in his study on the relationship between creative behaviour in music and selected variables as measured in high school students found that IQ and gender are significantly related to improvisation creativity but not to composition and analysis creativity. He also found that age, grade level, performance medium, and piano lesson background do not relate significantly to any of the modes. Webster in composition found that males scored slightly higher than females. Those members of the sample with a piano lesson background scored higher than the other members. Similarly, those members of the sample with just an instrumental background scored higher than the other members. In other words, students with piano lesson or instrumental background had higher creative scores than those without.

In conclusion, there is a lack of research evidence to show conclusively that either males or females are superior in creative thinking. Although some investigations have reported that males are more creative than females, others have reported that females seem to outperform males. Yet other studies reveal that neither boys nor girls seem to be an advantage with regard to their level of creativity. Creativity studies are not limited only to the western culture. Studies of Caucasian and Chinese revealed quite similar findings compared to the western ethnicity. The above literature indicated that the environment where the students interact plays an important role in enhancing creativity.

2.10 Relationship between Creativity and Musical Exposures

The review of literature reveals that musical exposures such as musical experiences, aural discrimination skills, and self-esteem of musical ability influences creativity. However, the research findings of these relationships were rather inconsistent whether they are or are not related to creativity. Here are a few studies to support the literature of inconsistent findings

Menard (2009) conducted an investigation of creative potential in high school musicians. Menard used a mixed-method technique to look into students' attitude and teachers' perception regarding creativity, composition, and its assessment possibilities. The students participated in the Talented Music Program and a typical performance based band program for six weeks. At the end of the program the final composition was evaluated by teachers, students, and expert composers. Data were collected from interviews, observations, attitude surveys, student and teacher journal, and composition assessment. One of Menard's research questions is to investigate the relationship between a student's musical backgrounds particularly years of experience on a primary instrument. Pearson Product-Moment correlation was used to examine the relationships. Menard found that years of experiences in playing a primary instrument correlate significantly with creativity, craftsmanship, and aesthetic value. Menard concluded that students with more experiences in composition and student's years of experience on a primary instrument could provide a higher level of ability to manipulate the medium of music and create compositions of higher technical quality and more pleasing to the listener. Menard further commented that “the low correlation between the students’ experiences on their musical instrument and their creativity indicate that creativity may be a completely different construct than musicianship,” (pg. 108). Menard defined musicianship as the mastery of technical and musical skills.

Auh (1995) investigated on musical exposures such as informal musical experience and self-esteem of musical ability. In addition, Auh also examined the best predictors of musical creativity in composition among selected variables of formal and informal musical experiences, musical self-esteem, musical aptitude, musical achievement, academic grades, IQ, and gender for upper elementary students. The musical creativity of 67 fifth and sixth grade students of a public elementary school was measured by a composition task. The Self-esteem of Musical Ability by Schmitt (1979) was used to measure students’ self-esteem. In Auh’s study, it was found that SEMA has no significant relationships with any of the composition dimensions and is not a predictor of compositional creativity. However, informal musical experience was found to be the best predictor of musical creativity.

According to Laycock (1992), self-concept refers to the ways in which an individual sees himself and feels about himself which is an important attribute and one of the keys to understanding the behaviour of a person. Laycock conducted a study on 56 high school students from a suburban Cleveland, Ohio high school. Laycock sought to determine whether significant relationships exist between the musical characteristics of original compositions produced with the students’ musical experience, musical aptitude, self-concept as musicians, age, and academic achievement.

Laycock found that the most significant factor related to compositional ability of high school students was self-esteem. This is in line with Austin (1990) who stated that in the course of educational development in a student, new musical experiences and discoveries in the process of learning will assimilate and integrate into students’ self-esteem. Students will accept and incorporate situation that is friendly and avoid a situation that is threatening. Forcing students into a music program by curricular, parental, peer and scholastic pressures will create poor student-teacher relations and loss of interest, which leads to negative self-image in music.

In a study conducted by Yong (1993) in Malaysia, it was found that self-concept had a low but significant relationship with overall creativity. However, multiple regression analyses indicate that self-concept was not a significant predictor for overall creativity. A comparison between high and low figural did not reveal any significant difference in their self-concepts. The findings of the study suggest that students who are not creative may have a relatively low self-concept and tend to perceive themselves as unsuccessful and unfulfilled.

Webster (1977) found that music achievement is most strongly related variable to creative potential and is the best single predictor of this potential. In Webster's study which he intended to identify significant relationships between factors of creative thinking ability in music and selected musical and non-musical variables in person were conducted for students between ages 14 to 18 years.

In his study, Webster used the Music Achievement Test developed by Colwell to measure aural discrimination. The sub-tests examine auditory-visual discrimination, melody recognition, pitch recognition, and instrument recognition. The auditory-visual discrimination subtest attempts to measure music reading skills by asking the individual to match the music he listens to the music that he sees on the answer sheet and indicate which of the written measures deviate rhythmically from the sound. There are 14 items, each with four measures. Melody recognition subtest involves the ability of the individual to perceive a melody in a three voice structure.

For each item, the melody is played first by the piano, and then repeated in a three voice setting played by the violin, viola, and cello. The individual must choose which voice contains the melody. There are 20 items in all. The pitch recognition subtest requires the individual to discriminate between aurally perceived intervals and, in one sense, is a test of music reading. The individual must choose either the first, second, or third note that is heard after the written pitch. There are 20 items in all. The instrument recognition subtest asks the individual to discriminate between the sounds of orchestral instruments. There are two sections of this 15-item test, one that deals with melody instruments and one that deals with accompanying instruments. The accumulated score is the composite music achievement score.

Other than the Music Achievement Test used to measure aural discrimination skills, Webster also used Music Aptitude Profile by Gordon to measure musical aptitude. Only the Tonal Imagery section is used. It has three scores - a melodic score, a harmony score, and a total score. The melody activity comprises forty items, requiring the individual to compare a musical answer to a short selection performed on a violin. The students need to identify whether the musical answer is or not a melodic variation of the selection. The harmony activities involve a similar process as described above except for an added part. The selection and its answer are now in the form of a duet between a violin and cello. The violin part is the same in both the selection and its answer. The cello line, however, contains the changes in the answer which the individual must decide are “like” or “different” from the initial selection. As in the melody activities, there are forty items in all.

Webster found that figural creativity has no significant correlation with composition scores. Aural-visual discrimination correlated significantly with all the composition sub scores. Music achievement is the only variable that has a significant relation to composition. Verbal creativity, figural creativity, music aptitude, IQ, sex, age, grade level, and piano lesson background were all shown not to be significantly related but males, instrumentalist, and who had piano lesson scored higher. Melody recognition is least related to composition, however, auditory visual discrimination was the most related to the criteria sub scores.

Different results were reported on the relationship between musical creativity and aural discrimination skills. Back in the 70s, Vaughan and Myers (1971), Gorder (1980), and Schmidt and Sinor (1986) reported that aural skills and musical creativity are not related. Roderick (1965) and Simpson (1969) also indicated the same findings. However, Webster (1977, 1979), and Vaughan (1977) revealed that aural skills were a good predictor of musical creativity.

In conclusion, the above review suggested that the musical exposures of an individual in the learning environment such as involvement in musical activities, and exposures to aural discrimination skills, may have considerable influence on his or her creativity. These musical exposures may affect the trainee teacher's self-esteem in musical ability. In addition, the Colwell's Musical Achievement Test is used widely by music researchers since the early years. It was considered to be reliable and valid in measuring students' aural discrimination skills for more than 40 years. Nevertheless, the results of the relationships between musical creativity and aural discrimination skills are still inconclusive. The inconsistent results could be due to the various instruments used in the study in measuring aural discrimination and musical creativity.

2.11 Predictors of Musical Creativity

Other than studies on the relationships between musical creativity and its factors such as musical or non-musical aspects, studies on the best predictors of musical creativity were also conducted. Webster (1979) investigated the relationship between creative behaviour in music and selected variables namely IQ, sex, age, grade level, piano lesson background, music achievement, and music aptitude. There are three modes of creative behaviour in Webster's study. The three modes were composition, improvisation, and analysis. The sample in Webster's study consisted of 77 high school students who had participated in school music groups. However, they have no systematic training in creative skills in music.

Webster found that music achievement correlated significantly with composition, improvisation, and analysis creativity. Music achievement is the single best predictor of each mode. Webster also found that figural creativity correlated significantly with improvisation and analysis creativity. Further analysis revealed that verbal creativity was significantly correlated with analysis creativity but verbal creativity was shown not to be a good predictor when combined with other variables. Webster also found that IQ and sex were significantly related to improvisation. However, IQ and sex is not related to composition and analysis creativity according to Webster. The other personal that were age, grade level, performance medium, and piano lesson background did not relate significantly to composition, improvisation, and analysis creativity. Webster concluded in the discussion section that the results showed clearly that those students who scored highly in music achievement tend to score highly on composition, improvisation, and analysis creativity. One of the components in music achievement that may influence compositional creativity is aural-visual discrimination. He further suggested that a firm grounding in the basic skills of aural discrimination may be important in establishing a basis for creative ability.

Laycock (1992) conducted a study to look at the relationship of musical experience, musical aptitude, self-concept, age, and academic achievement in the musical problem solving abilities of high school students. The purpose of the study was to determine whether significant relationships exist between musical characteristics of original compositions produced by high school students and that student's musical experience, musical aptitude, self-concept as musicians, age, and academic achievement. Laycock views compositions as a form of musical problem solving. The dependent variables are the musical characteristics that are tonality, meter, motive, length, replication, phrasing, complexity, originality, and cohesiveness. The independent variables are student's musical experience, musical aptitude, self-concept as musicians, age, and academic achievement. Laycock attempted to answer five research questions: (1) Is there a relationship between in-school and out-of-school music experience and the musical characteristics of high school students' music compositions? (2) Is there a relationship between music aptitude and the musical characteristics of high school students' music compositions? (3) Is there a relationship between self-concept as a musical and the musical characteristics of high school students' music compositions? (4) Is there a relationship between age and the musical characteristics of high school students' music compositions? (5) Is there a relationship between academic achievement and the musical characteristics of high school students' music compositions?

Laycock administered his study to 56 high school students. Each student was required to compose a melody on an acoustic piano. The maximum time limit is twenty minutes. Laycock tape recorded the compositions. He then analysed the compositions. The compositions were rated by two independent judges.

Laycock found that there is a strong relationship between musical experience and self-concept as musicians and the musical characteristics of the students' original compositions. Laycock also found that there is a strong relationship between musical aptitude, age, and academic achievement and musical characteristics of the students' original compositions. However, the strength is not strong.

In 1995, Myung-Sook Auh conducted a study to examine the best predictors of musical creativity in composition among the selected variables of formal and informal musical experiences, musical self-esteem, musical aptitude, musical achievement, academic grades, IQ, and gender. Other than the best predictors, the relationship between the variables and musical creativity were also examined. Auh (1995) conducted the study to re-examine the literature of inconsistent findings of previous research concerning the relationship between musical creativity and the above variables. According to Auh, literatures concerning the best predictor of creativity of upper elementary students and the role of informal musical experience in musical creativity were not investigated. Later in Auh's study, she discussed the implication and contribution for teaching and research of the study.

Auh defined creativity based on proclamations by Torrance (1970), Amabile (1983), Webster (1990a, 1990b, 1994, 2002), and Weisberg (1988). Musical creativity in Auh's study was defined on the basis of the ideas of product-orientation and problem-solving ability. Musical creativity is the ability to solve musical problems in original and coherent ways. Auh further defined improvisational creativity and composition creativity. Improvisation creativity is the "ability to create music spontaneously which is original and coherent, but may not be repeatable by the music maker." Composition creativity is the "ability to create music reflectively which is original, coherent, and repeatable by the music maker."

The subjects of Auh's study were seventy fifth and sixth grade elementary students from an inner city public school located in an urban area of Ohio. The number of subjects according to Auh was to fulfil the requirement of the multiple regression analysis because there were seven independent variables proposed. Auh also gave a description of the school music program. The general music class was a required program for all students. The focus of the program was on vocal music and the program did not provide instrumental learning except recorders. The students interact with the music teacher in the general music class once a week for 35 minutes. Texture, pitch, rhythm, style, timbre, and dynamics are concepts that the music teacher based on together with the pedagogy of Orff-Schulwerk.

Auh's had four instruments to measure musical creativity and the variables. The four instruments were Musical Experiences Questionnaire, the Self-Esteem of Musical Ability measure, the Musical Aptitude Profile, Melody and Meter subtests, and the Musical Achievement Test, Test 1. Auh gave a clear description of each of the instrument used. Auh devised the Musical Experiences Questionnaire to gather information about students' involvement in musical activities such as school band, school orchestra, school choir, church choir, private lessons, and/or other musical activities. The number of years of involvement was requested. Students' informal involvement in musical activities was the second part of the questionnaire. Auh stated that the elementary students had activities in church and outside the school, hence "if these informal musical activities were not counted as part of their musical experience, important information may be lost." Information that Auh requested were about students' involvement in watching MTV, listening to records, CDS, tapes, radio, singing, making up a song, playing musical instruments, dancing, and going to concerts.

Auh used the Self-Esteem of Musical Ability questionnaire developed by Schmitt in 1979 to measure her children's self-opinion on their self-confidence in music, musical skills and abilities, and the influence of significant others on their musical ability. The Self-Esteem of Musical Ability measure has 43 four Likert scale like items. Auh administered a test-retest on SEMA and found that it has high reliability (r = .91). The construct validity administered also showed high correlation. According Auh, Austin (1990) and Laycock (1992) also employed SEMA measure in their study and they also found that SEMA is a reliable tool to measure musical self-esteem not only to elementary students but also to high school students.

Other than musical self-esteem, Auh also investigated on her students' musical achievement in relation to creativity. Auh used the Musical Achievement Test 1 which was developed by Colwell in 1969. There were four tests in Colwell Musical Achievement Test. According to Auh, Musical Achievement Test, Test 1 was chosen for the research because the subject matter covered in the Musical Achievement Test, Test 1 is related to what students learned in class. The content of Musical Achievement Test, Test 1 was pitch discrimination, interval discrimination, and meter discrimination. The reliabilities reported by Colwell in the Interpretive Manual according to Auh, stated that the split-halves reliability of the Musical Achievement Test, Test 1 was .94. Furthermore, Auh computed her reliability index using the Kuder-Richardson showed a reliability index .88. Hence, the Musical Achievement Test, Test 1 had a high reliability index and also had reasonable 30 minutes testing time according to Auh.

Auh described her procedure of data collection in detail. She started her data collection with the distribution of permission letters to the parents of the students chosen. Composition testing was carried out after that, followed by the administration of the questionnaires for musical experience, musical self-esteem, and tests for musical aptitude and musical achievement.

The composition testing was to measure musical creativity. A well-arranged room was used and the instruments involved in the study has to be "a musical instrument familiar to the students so that the performance medium used did not inhibit the students' ability to create music" according to Auh. Students were tested individually for 30 minutes. Auh discussed the rationale for instructions on the Composition Test. She decided to give a maximum of 10 minutes for students to practice and make up a song. Auh rationalised that Kratus (1994) also gave the same length of time in his study to elementary children. However, Laycock (1992) gave 20 minutes to his respondents to practice and make up a song. Laycock's respondents were high school students. Hence, Auh concluded that the length of time to compose a song depended on the academic level of the respondents. As for the length of composition composed, Auh limited the length of each composition to three minutes or less. This is because according to Auh, a longer song does not indicate a higher level of creativity. Auh concurs with Kratus (1989) that a composition can only be defined as a composition product when its composer is able to repeat it. Therefore, one of the dimensions measured in Auh's study was the ability to repeat the composition as similar as possible.

There were five dimensions in Auh's study that were craftsmanship, musical syntax, musical originality, musical sensitivity, and repetition of song. Auh rationalised her dimensions based on study by Amabile (198), Kratus (1990), Laycock (1992), Russ (1993), and Webster (1987). Craftsmanship according to Auh's definition is "the degree to which the tonal and rhythmic elements in a composition show technical mastery in terms of tonal center and rhythmic regularity" (p. 80). As for musical syntax, Auh defined it as "the degree to which the tonal and rhythmic patterns in a composition are structured in a logical manner, so that the music makes sense" (p. 80). Musical Originality was defined as "the degree to which the composition is unique, when compared to the existing songs for children, and different from the songs by other children" (p. 80). Musical Sensitivity was defined as "the degree to which the composition is musically expressive, so that the music reflects the child's aesthetic sensitivity in music" (p. 80). Lastly, repetition of song was defined by Auh as "the degree to which the second playing of the composition is the same as the first playing of the composition" (p. 81). Auh had three judges to rate the students' composition using a 7-point scale.

The interjudge reliability of the three judges in rating the composition score showed high correlation (r = .71 to .79). However, according to Auh, the results were lower than those found in Kratus (1994) but similar with the interjudge reliabilities of Webster (1987), Baltzer (1990), and Laycock (1992). Auh also performed a normality check on her informal musical experience data. It was found that the data of informal musical experience were not normally distributed. The skewness and kurtosis exceed ±1. However, all other variables were normally distributed.

Findings from Auh's study showed that formal musical experience was significantly correlated with musical self-esteem and gender. Female students had higher formal musical experience than the male students. Informal musical experience was not significantly correlated with any of the independent variables gender. Female students had higher ratings for informal musical experiences than male students. Musical aptitude-tonal was significantly correlated with musical achievement-pitch. Musical aptitude-tonal, rhythmic and composite and musical achievement-pitch and composite were all significantly correlated with one another. Musical aptitude-tonal and musical achievement-pitch was, otherwise, not significantly correlated with any of the other variables. The musical achievement - interval was not significantly correlated with musical achievement-pitch; it was significantly correlated only with musical achievement-composite. Despite the low reliability of musical achievement-meter, musical achievement-meter was significantly correlated with musical achievement-pitch and composite. Academic grades were not significantly correlated with other independent variables except for IQ and gender.

Auh reported that the best predictors of compositional creativity were informal musical experiences, musical achievement, and academic grades, which accounted for 25% of the variance in total composition ratings. Auh also reported that compositional creativity was significantly related to informal musical experiences, music aptitude, musical achievement, and academic grades. Compositional creativity was not significantly related to formal musical experiences, self-esteem, gender, or intelligence.

The implications of Auh study are that music teachers should encourage students to enjoy creating music at home or outside the school with friends and family members. Music teachers also should emphasize the joy of music-making in class.

What is the view that could be emulated from Auh's study? First, Auh's best predictor for musical creativity was informal musical experiences, followed by musical achievement and academic grades. The finding is inconsistent with Webster (1977) who found that music achievement was the best single predictor of musical creativity.

Second, Auh only had five dimensions in musical creativity: craftsmanship, musical syntax, musical originality, musical sensitivity, and repetition of song. Auh did not investigate musical fluency, musical elaboration, musical resistance to premature closure and musical abstractness of title which are creative dimension suggested by Torrance in 1983 and used in Squelia's study.

Third, Auh's and Laycock's procedure in the composition data collection were systematic and effective. In view of Auh's statement, that instrument which are used to measure creativity have to be a musical instrument familiar to the students so that the performance medium used did not inhibit the students' ability to create music, this study uses keyboard and digital piano to collect data for musical creativity because the keyboard is a common instrument learnt by all music major trainee teachers in a teacher education institution in Malaysia.

Fourth, only pitch, interval, and meter discrimination were measured by Auh in the musical achievement test. The content of Test 1 in the Musical Achievement test used by Auh was too easy for trainee teachers in the teacher training institution level. Hence, Colwell's Test 2, 3 and 4 are investigated by the researcher and subsequently develop an adapted musical achievement test that is relevant to the level of the respondents.

In conclusion, there are studies conducted to investigate whether factors such as gender, formal and informal musical experiences, musical self-esteem, musical achievement, and academic grades predicts musical creativity. However, there is no conclusive finding on the best predictor of musical creativity. Besides that, from the literature, it was found that Laycock (1992) and Auh (1995) had a systemic procedure in administering the composition test which is adopted in this study.

2.12 Theoretical Framework

The aim of this study is to examine the influence of musical exposures such as keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability and personal variables such as gender, ethnicity, academic year, and socioeconomic status may influence the trainee teachers' musical creativity and general creativity. The theoretical framework of this study is the System Model of Creativity (SMC). The SMC describes a dynamic operation of three elements (1) a culture that contains symbolic rules, (2) a person who brings novelty into the domain, and (3) a field of experts who recognize and validate the innovation. This SMC is proposed by Mihaly Csikszentmihalyi (Csikszentmihalyi, 1998).

SMC is a powerful model and the interconnections between the three elements have no starting point. The model posits that for creativity to occur, the individual, the domain and the field must interact with one another. Each component in the system is important no more or less necessary than the other. The three elements affect the others and in turn affected by them as shown by the arrows in Figure 2.1.

The model shows that creativity is not happening solely in the mind of an individual. A creative idea that is expressed need to be understood by others and accepted by the culture. For creativity to occur, a set of rules and practices transmit from the domain to the individual. The rules and practices influence the individual when the individual produces the novel variation. The novelty of the product is accordance to the context of the domain. The variation then is selected by the field for inclusion into the domain. “The individual mental process of creativity must exist within the context of pre-existing social and cultural achievements and cannot be viewed as separate from them” (Yannon, 2011, p. 43). The SMC can be adapted into the learning environment such as the classroom. According to Csikszentmihalyi (1998), the domain is the body of knowledge within the learning environment that is transmitted to the students. The field is represented by the teacher, or the person controlling the knowledge and its transmittal. The student in the learning environment is the person or the creator. Hence, in the SMC, knowledge is transmitted, the students learn or exposed to the skills and information from the teachers. They use this knowledge to create and reshape the knowledge base and this cycle continues.

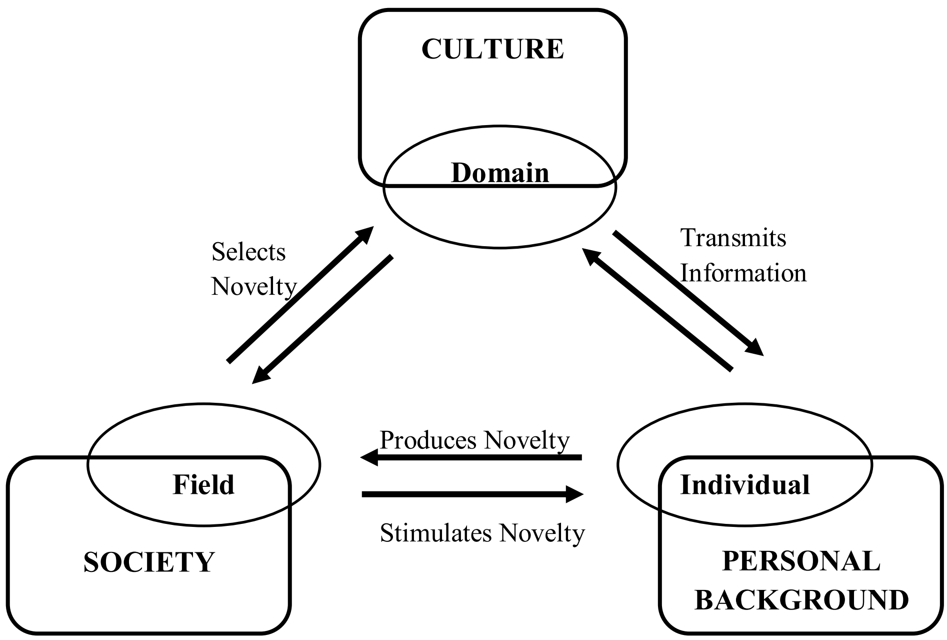


Figure 2.1. The System Model of Creativity (Csikzentmihalyi, 1988)

In this study, therefore, the System Model of Creativity (SMC) is employed to explain theoretical links between musical exposures, personal variables, and creativity. Musical exposures include musical activities that influence the musical aspect of the trainee teachers such as keyboard grades, musical activity involvement, aural discrimination skills, and self-esteem of musical ability. On the other hand, personal variables are gender, ethnicity, academic years, and socioeconomic status.

The SMC integrates various theories important to creativity and its related variables. SMC assumes that automatic associations between musical exposures and personal variables play a major role in enhancing creativity.

2.12.1 Personal Variables

The personal variables are the individual characteristics brought into a particular situation. The personal variables of the trainee teachers can include age, gender, ethnicity, and socioeconomic status. The gap in the age of the trainee teachers in this study is not wide, hence, the academic year is considered instead of age. The respondents of the present study came from a multicultural society. Hence, it was considered interesting to investigate whether there is or not influence from different cultural background on creativity. Studies on socioeconomic status and creativity reviewed in this chapter have shown inconsistent results. Hence, to further investigate this relationship, socioeconomic is included as one of the personal variables.

2.12.2 Musical Exposures

The musical exposure variables are the environmental factors that may influence individual creative abilities. Considering that the trainee teachers majored in music education, the musical exposure variables are concerned musical aspects. Musical exposure variables that may or may not influence creativity investigated in this study are trainee teachers' skill on the keyboard. The keyboard skills are measured from their grades achieved in formal music examinations such as piano, keyboard, or organ examination. The next musical exposure variable is musical activity involvement. The trainee teachers are encouraged to participate in musical activities such as choir, band, gamelan, caklempong, recorder ensembles and many more. Some of the trainee teachers took music lessons from private teachers outside the institution. Aural discrimination is another musical exposure that the trainee teachers are introduced to as one of the course in the program. Aural skills such as listening and discriminating pitch, mode, interval, meter, cadence, and auditory-visual were taught as they were in the syllabus. Self-esteem of musical ability measures the trainee teachers' self-perception of musical ability, support, and recognition by others for their musical ability, and their personal interest and desire for music.

2.13 Theories Related to Creativity

Many controversial discussions surround the origin of creativity of a person. Many psychologists and philosophers have formulated and advance theories of creativity however, these theories vary widely. To date, none of these theories have provided a persuasive comprehensive theoretical explanation of creativity (Runco, 2007a). However, from several reviews of creativity theories, it can be seen that creativity theories have been categorized in a consistent classification. Researchers of creativity in their review categorised creativity theories according to the following categories: developmental theories, psychometric theories, cognitive theories, and systems theories. (Beghetto & Kaufman, 2007; Kozbelt, Beghetto, & Runco , 2010; Runco, 2007b).

Gowan (1979), Torrance (1962), Piaget and Vygotsky have similar views in line with developmental theories. Their developmental paradigm is associated with creative thinking where creative thinking develops over time and is mediated by an interaction of person and environment. Hence, in developmental theories, the surrounding of a person could enhance the development of creativity (Csikszentmihalyi, 1996).

Cognitive theories emphasize the creative process and the creative person. According to Kozbelt, Beghetto, and Runco (2010), differences in cognition can play a role in creativity. In the Guilford Structure of Intellect (SOI) model, there are 80 different kinds of cognition. He proposed that there are 180 cells in the SOI. Guilford referred to these processes as mental operations. In SOI, intelligence is defined as a collection of functions for processing information. These intellectual functions are categorized as informational contents, mental operations, and informational products. Informational contents refer to the kinds of information contained in or used by the mind; mental operation refers to the basic processes performed on information by the mind, and informational products represent the form of the information. Mental operation category involves five intellectual functions which are cognition, memory, divergent production, convergent production, and evaluation. In the SOI, although all the intellectual functions are related to creativity, it is the operation of divergent production that is directly related to creativity for it is critical for creative behaviour and spurs creative activity. To Guilford, creativity by itself is a multi-dimensional variable that is different from intelligence.

2.14 Approaches to Creativity Research

The approaches toward the study of creativity vary just as the wide variety of theoretical explanations of creativity. However, for the purpose of this study, the confluence approach and the componential approach are discussed.

2.14.1 Confluence Approach of Creativity

The reviews of studies hypothesized that creativity involved more than a simple sum of a person's level on creativity. The multiple creative dimensions flowing together build a more complete understanding of the concept of creativity (Menard, 2009). Furthermore, creativity has been studied extensively with regards to personality attributes, process, product, and creativity-fostering environments (Sternberg, 2006).

Csikszentmihalyi (1996) supports a confluence approach in the study of creativity. He believes that examination of only creative person or the creative process alone is limiting. The true creativity exists in an eminent form of big C but creativity is also found in children and everyday life and this small c creativity should be encouraged.

Amabile (1996) also supports the confluence approach in the study of creativity. Amabile states that the descriptions of the creative process by eminent individuals often included social-psychological factors as an influence on the creativity of exceptional individuals. Amabile's social psychology of creativity aims to identify the confluence of social and environmental factors, personal abilities, and characteristic that can positively influence creative performance.

2.14.2 Componential Approach of Creativity

A person who is creative is a person who possesses skills specific to the domain where creativity takes place, and the skills are relevant to the creative person. The process of divergent thinking and task motivation happens in the domain (Amabile, 1983). In this componential theory, there are two types of skills that a creativity person should possess that are the domain relevant skills and creativity relevant skills. In the domain relevant skills there are knowledge and technical skill which are skills that determine the range of possible responses to a problem. As for the creativity relevant skills, they include appropriate cognitive style, implicit and explicit heuristics for generating novel ideas and conducive work style. These skills determine the extent to which the creative product will impact the domain in a novel way.

2.15 Conceptual Framework of the Study

Based on the theories, models and research evidences in the above literature, the conceptual framework of this study is formed. The conceptual framework is presented in Figure 2.2. This framework consists of two independent variables that are musical exposures and personal variables. The musical exposures consist of keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability of the trainee teachers. The personal variables consist of trainee teacher's gender, academic year, ethnicity, and family socioeconomic status. The dependent variables are musical creativity and general creativity.

Based on the definitions and measurements of musical creativity, there are nine components of musical creativity formulated. These components are categorised into four dimensions. The first dimension is creative dimension which has components of creative characteristics. It consists of musical fluency, musical originality, musical elaboration, musical resistance to premature closure, and musical abstractness of title. The second dimension is technical goodness. It consists of components of technical characteristics that are craftsmanship and musical syntax. The third dimension is aesthetic appeal. Aesthetic appeal consists of musical sensitivity. And the last dimension is repetition of song.

The creative dimension is investigated in this study because from the literature reviews it was found that the majority of composition studies focused on the technical characteristics of the technical processes of composition rather than on the explicit creative aspects of the composition process or product. Hence, this study would like to address this concern.

As for general creativity, this study adopted the definitions of Torrance (Torrance & Ball, 2008). The components of general creativity are figural fluency, figural originality, figural elaboration, figural resistance to premature closure, and figural abstractness of title.

In this conceptual framework, the researcher hypothesised that creativity (musical creativity and general creativity) of the trainee teachers are influenced by the musical exposures. This study also would like to ascertain the relationships between the musical exposures and creativity (musical creativity and general creativity) and to what extent individual differences such as gender, ethnicity, academic years, and socioeconomic status moderate these relationships.

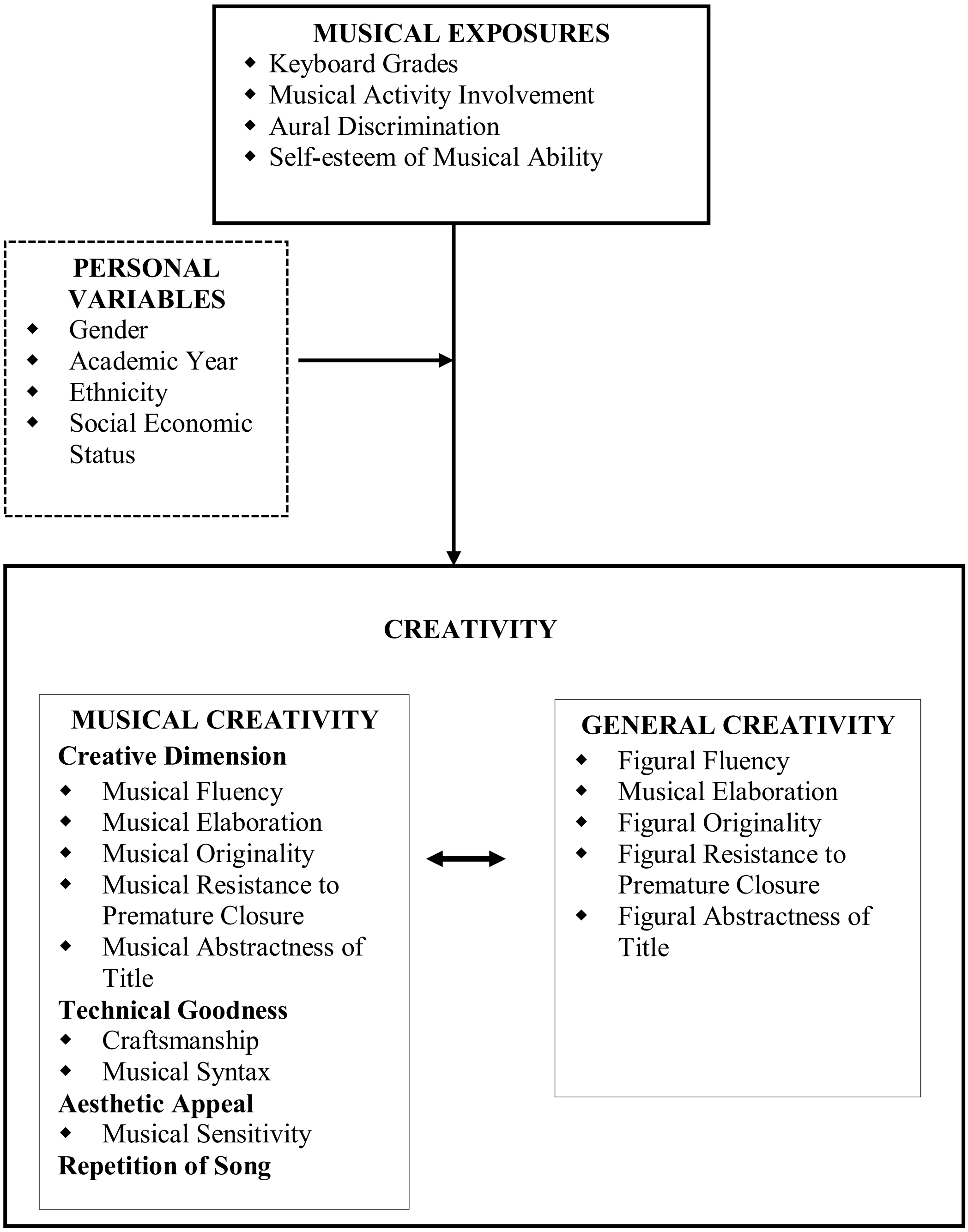


Figure 2.2. Conceptual Framework of the Study

2.16 Summary

Studies of creativity which have been reviewed focused widely on musical creativity and general creativity. The review on the meaning of creativity by varies researcher found no single definition. However, there is a consensus among the psychologist and researchers in the areas of creativity and the characteristic of creative thinking. Similar to general creativity, musical creativity has no single definition. The Conceptual Model of Creative Thinking by Peter Webster (Webster, 1987) enlightens the term musical creativity by abstracting the creative product, creative process, and product intention.

Numerous research on musical creativity and general creativity have been conducted in the west and some done locally with the intention to glean a better understanding of creativity and its relationships with factors such as gender, ethnicity, academic years, socioeconomic status, home environment, self-esteem, and musical experiences.

Literature on the relationships between personal variables such as gender, ethnicity, academic years, and socioeconomic status, and musical exposures such as keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability were reviewed to provide a preliminary understand for a comparative study. In addition, the relationships between musical exposures and creativity were also reviewed.

The literature reviewed found that there are consistent, inconsistent, and contradictory findings. The inconsistencies in the results of the studies reviewed may be due partly to differences in research methodology, measurement used, age of subjects, and the period of the study. A detail description of the instruments used for measurement of musical creativity and their validity were reviewed.

From the literature review, the researcher based this study on the System Model of Creativity suggested by (Csikzentmihalyi, 1988). In order to make this study manageable and feasible, only the musical exposures, creativity (musical creativity and general creativity), and the nature of the creative process with its relationships with personal variables and musical exposures were investigated.

In summary, studies of creativity in Malaysia have focused on primary and secondary students. The nature of primary and secondary students was investigated and the variables affecting their creativity such as personal, cognitive, and home environment were examined. Hence, a study on teacher to be, who would be moulding the next generation of inventors is necessary to substantiate the pool of creativity research in Malaysia.

This chapter has provided a review of the literature that is pertinent to this study. It provides useful information for the researcher to formulate the conceptual framework, plan the design of the study, instrumentation, and data analysis.

The following chapter outlines the methods, procedures, and data analyses that were used to examine musical exposures, creativity, relationships between variables of personal variables, musical exposures, and creativity among music major trainee teachers in Malaysia.

CHAPTER 3

METHODOLOGY

The primary purpose of the survey study is to investigate the influence of musical exposures on musical creativity and general creativity. In addition, the nature of the creative abilities of the Malaysian teacher trainees is examined. This study also attempts to ascertain relationships between musical creativity and general creativity and its components. Besides that, the relationships between musical exposures and personal variables and between creativity and personal variables are investigated. The personal variables are gender, ethnicity, academic year, and socioeconomic status. The musical exposure variables are keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability. This study also determines the predictors of musical creativity and general creativity. To address the purposes of the study, quantitative data were collected. According to Leedy & Ormrod (2009), the advantages of quantitative research are that statistical analysis of numerical data allows the researcher to determine significance and formulate objective conclusions and recommendations based on numerical data rather than personal point of view or subjective information.

This chapter presents a description of the methodology of the study in various sections. The research design is presented in the first part. The second part describes the population and the sample of the study. This is followed by the discussion on instruments used in the collection of quantitative data. The data collection procedures describing the administration of instruments are also presented. Then the discussion of the pilot study and the analysis of reliability of the instruments are presented. Lastly is the description of the quantitative data analysis procedures according to each research question. The chapter concludes with a summary.

3.1 Research Design

As the research question concerns the relationships between musical exposures and creativity (musical creativity and general creativity), a correlation design was adopted. The design was chosen because it is appropriate for investigating the relationship between two or more variables that do not lend themselves to manipulation (Chua, 2012; Fraenkel & Wallen, 2000; Gay & Airasion, 2003). This study is theoretically driven by the quantitative paradigm. This approach has been used in other musical creativity research (e.g. Auh, 1995; Laycock, 1992; Webster, 1979).

3.2 Population and Sample of the Study

This study was conducted in seven teacher education institutions out of twenty-seven institutions in Malaysia. These seven institutions were selected based on the following criteria. First, the institution administration was willing to allow participation of the researcher in the study. Second, the institutions had teacher trainees who major in music education and were undergoing training for undergraduate studies in the music education program. Upon completion of the studies, these trainee teachers will be conferred with a Bachelor of Teaching in Music Education in Primary Education with Honours. Third, all the selected teacher trainees fulfilled the necessary requirement which is an academic achievement of at least six credits in their Malaysian Certificate of Education (*Sijil Pelajaran Malaysia)* examination result. They also underwent an interview and a general test before the selection into the program. However, the musical experience and musical abilities of the trainee teachers vary.

The trainee teachers in the study underwent a four years bachelor program, which consisted of eight semesters. There are six credits of music studies in each semester except semester 7 which only consist of three credits. Table 3.1 shows the structures of course for the Bachelor of Teaching in Music Education for Primary

Education. In semester one, the trainee teachers learned the aural and listening skills from Aural and Sight Reading I (MZU3101) course. They also acquired the knowledge about the rudiments of music theory in the Theory Music I (MZU3102) course. During this semester, the trainee teachers acquired the skills of mastering the keyboard in the Keyboard Efficiency I (MZU3103) course. Lastly, they were taught about the philosophy of music education in the Basic Music Education (MZU3104) course.

In semester two, music studies consist of Theory Music II (MZU3105), Keyboard Efficiency II (MZU3106), Music in the Classroom (MZU3107), and Principle Instruments. The principle instruments course consists of three instruments that are piano, guitar and vocal. The trainee teachers choose which principle instrument to learn according to their choice. They have two and a half years to master the chosen instrument.

In semester three, the trainee teachers underwent courses such as Aural and Sight Singing II (MZU3109), Keyboard Playing and Singing in the Classroom (MZU3110), Approaches to Music Teaching (MZU3111), and Principle Instruments II (MZP3112).

In semester four, the trainee teachers were taught how to compose a four-part recorder ensemble and conducting in the Composition and Ensemble I (MZU3113) course. The Curriculum in Teaching Music I (MZU3114) course exposed the trainee teachers to the syllabus and teaching activities used in the primary schools. The trainee teachers proceed in their principal instrument in Principle Instruments III (MZP3115) course.

Table 3.1

Courses offered in the Bachelor of Teaching in Primary School for Music Education Program

Year	Semester	Code	Courses	Credit
1	1	MZU3101	Aural and Sight Singing I	1
		MZU3102	Theory of Music I	2
		MZU3103	Keyboard Competency I	1
		MZU3104	Foundation of Music Education	2
	2	MZU3105	Theory of Music II	2
		MZU3106	Keyboard Competency II	1
		MZU3107	Music in the Classroom	2
		MZP3108	Principle Instruments I	1
2	3	MZU3109	Aural and Sight Singing II	1
		MZU3110	Keyboard Playing and Singing in the Classroom	1
		MZU3111	Approaches to Music Teaching	3
		MZP3112	Principle Instruments II	1
	4	MZU3113	Composition and Ensemble I	3
		MZU3114	Curriculum and the Teaching of Music I	2
		MZP3115	Principle Instruments III	1
3	5	MZU3116	Malaysian Music	3
		MZU3117	Curriculum and the Teaching of Music II	2
		MZP3118	Principle Instruments IV	1
	6	MZU3119	World Music	2
		MZU3120	Composition and Ensemble II	3
		MZP3121	Principle Instruments V	1
4	7	MZU3122	Action Research I in Music Education	3
	8	MZU3123	Music Technology	3
		MZU3124	Action Research II in Music Education	3
			Total Credits	45

In semester five, music studies consist of Malaysian Music (MZU3116), Curriculum in Teaching Music II (MZU3117), and the continuation of Principle Instruments (MZP3118) course. World Music (MZU3119), Composition and Ensemble II (MZU3120), and Principle Instruments (MZP3121) are offered in semester six. In semester seven, the trainee teachers underwent an action research in music education course (MZU3122).

Lastly, in the final semester, which is semester eight, the trainee teachers were taught about using technology in Music Technology (MZU3123) course. Finally, the trainee teacher completed the write up of an action research report, carried out during the practicum session (MZU3124).

Seven institutions were selected for this study. The institutions are situated in different parts of Malaysia. Six of these institutions are in Peninsular Malaysia and one in East Malaysia. Out of the six institutions, three of these institutions are in the northern region of the Peninsular Malaysia, one in the eastern region, and two in the central region. Table 3.2 shows the population of the study according to each institution. The total number of the population of the trainee teachers undergoing music major studies was 234.

Table 3.2

Population of the Study

Institutions	Number of Population of the Study
IPG 1	78
IPG 2	16
IPG 3	17
IPG 4	41
IPG 5	17
IPG 6	19
IPG 7	46
Total	**234**

Note. IPG = Teacher Education Institution

Table 3.3 presents the number of trainee teachers according to the academic year. There were 23 trainee teachers in year one, 45 trainee teachers in year 2, 72 trainee teachers in year three and 94 trainee teachers in year four. In total, there were 234 trainee teachers.

Table 3.3

Population of the Study by Academic Year

Academic Year of Trainee Teachers	Number of Population of the Study
Year 1	23
Year 2	45
Year 3	72
Year 4	94
Total	**234**

Table 3.4 presents the number of trainee teachers according gender. Out of the population of 234 trainee teachers, there were 74 males and 160 females.

Table 3.4

Population of the Study by Gender

Institutions	Number of Population of the Study	
	Male	Female
IPG 1	26	52
IPG 2	5	11
IPG 3	8	9
IPG 4	22	19
IPG 5	6	11
IPG 6	1	18
IPG 7	6	40
Total	**74**	**160**

Note. IPG = Teacher Education Institution

Table 3.5 presents the number of male and female trainee teachers according to the academic year. The data show that female trainee teachers outnumber male trainee teachers in all the years. The data also show that there were only four male trainee teachers in year one. Due to the small number of male trainee teachers (n = 4) compared to female trainee teachers, the correlation between gender and the other variables according to year will be weak. Hence, the correlation of gender according to academic year was not looked into in this study. However, the overall correlation between gender and other variables were analysed.

Table 3.5

Population of the Study by Year and Gender

Academic Year of Studies	Number of Population of the Study	
	Male	Male
Year 1	4	19
Year 2	18	27
Year 3	20	52
Year 4	32	62
Total	**74**	**160**

The researcher conducted a priori statistical power analysis to determine desirable sample size, power of .80 or greater, at .05 Type I error rate, and estimated population medium effect size. This analysis was computed using the statistical software Raosoft and StatPac Survey Software. Raosoft (2004) is an online sample size calculator that calculates the suitable sample size for a population. According to Raosoft.com, for a population of 234, the sample size is 146 at the 95% confidence level. StatPac Survey is also an online software and produced the same result as Raosoft. The Krejcie and Morgan table of sample size is also used to determine the sample size (Chua, 2006). It was found that Raosoft, StatPac Survey and Krejcie and Morgan all showed the same number of sample that was 146. However, since the population of the trainee teachers in year one was small (n = 23), the researcher decided to include all the trainee teachers in the study to increase the sample size. Hence, in this study, the sample size became 159 trainee teachers at the 95% confidence level.

A simple random sampling procedure was conducted to determine which trainee teacher was to be chosen as the sample of the study.

Firstly, the researcher listed the names of all the trainee teachers in alphabetical order and according to their classes and institutions. Next, the researcher determined the samples using the Random Number Table (Chua, 2006, p. 351). The quantities of trainee teachers chosen was according to the number needed as stated in Table 3.6.

Hence, from the random number table, the researcher listed the names of the sample of the study according to the institutions. In total, there are 159 samples in the study.

Table 3.6

Sample of the Study

Institution	Number of Sample of the Study
IPG 1	61
IPG 2	8
IPG 3	11
IPG 4	26
IPG 5	12
IPG 6	14
IPG 7	10
Total by Year	**159**

Note. IPG = Teacher Education Institution

Table 3.7 presents the number of samples of the study according to year of studies. The sample consisted of 23 trainee teachers from year one, 29 trainee teachers from year two, 45 trainee teachers from year three, and 62 trainee teachers from year four. The sample of this study consisted of trainee teachers from various years; hence, the cognitive abilities of the samples might vary due to the difference in their level of study. The number of years of training in the institution might influence their creativity and academic performance.

Table 3.7

Sample of the Study by Year

Year of Studies	Number of Sample of the Study
Year 1	23
Year 2	29
Year 3	45
Year 4	62
Total by Year	**159**

Table 3.8 presents the number of samples in the study according to gender. In total, there were 51 male trainee teachers and 108 female trainee teachers. The data show that there were more female trainee teachers compared to male trainee teachers in all the seven teacher education institutions.

Table 3.8

Sample of the Study by Gender

Institutions	Number of Sample of the Study	
	Male	Female
IPG 1	22	39
IPG 2	3	5
IPG 3	5	6
IPG 4	13	13
IPG 5	5	7
IPG 6	1	13
IPG 7	2	25
Total	**51**	**108**

Note. IPG = Teacher Education Institution

The academic year is one of the variables under personal variables in this study. Hence, the distribution of the trainee teachers according to year is necessary. Table 3.9 displays the number of male and female trainee teachers according to year in the study. The data show that there were more female trainee teachers compared to male trainee teachers in all of the academic year.

Table 3.9

Sample of the Study by Academic Year and Gender

Years of Studies	Number of Sample of the Study	
	Male	Female
Year 1	4	19
Year 2	13	16
Year 3	14	31
Year 4	20	42
Total	**51**	**108**

3.3 Instrumentation

According to Baltzer (1988), instruments used to measure general creativity and musical creativity play an important role in a study. The teacher's self-designed instruments and rating can be unreliable. This view has reinforced Torrance's (1970) recommendation. Torrance stated in one of his studies that the teacher's designed instrument to measure creativity have been found over the years to be unreliable. Hence, in this study, the researcher adopted, adapted, and designed the following instruments in order to achieve the purpose of this study.

1. A questionnaire was designed to collect demographic information such as age, ethnicity, gender, academic year, keyboard skills before entering the institution, and socioeconomic status of the trainee teachers.
2. A questionnaire named Musical Activities Involvement was adopted form Auh (1995) to enquire about the musical experience of the trainee teachers.
3. The Self-Esteem of Musical Ability measure that was developed by Schmitt (1979) was adopted to look into the self-concept level of the trainee teachers.
4. The Aural Discrimination Test, which was modified and adapted from Colwell's Musical Achievement Test, was used to measure the aural discrimination skills of the trainee teachers.
5. The Torrance Tests of Creative Thinking designed by E. Paul Torrance was adopted to measure the general creativity of the trainee teachers.
6. The Composition Test was designed to look at trainee teachers' musical creativity in composition. The procedure of the Composition

Test was similar to the rules and procedure of studies conducted on musical creativity by Auh (1995) and Laycock (1992).

The Self Esteem in Musical Ability questionnaire, the Musical Activities Involvement questionnaire, and the instructions in the Torrance Test of Creative Thinking were translated into Malay language. This is because the medium of instruction for the music courses in the teacher education institutions is *Bahasa Melayu* (Malay Language).

3.3.1 Demographic Questionnaire

The researcher designed the demographic questionnaire. It sought information about age, gender, ethnicity, and academic years. The information on the parent's educational background and income of the respondents was also requested to gain more information about the socioeconomic status of the respondents.

The demographic questionnaire also required the trainee teachers to state their piano or keyboard qualification. They were required to state the grade level acquired from the broad of examinations. The grade levels were then readjusted to form a similar grading.

In order to determine the socioeconomic status of the trainee teachers, studies by Gan (1998), Palaniappan (1994) and Yong (1986) were used as a demographic guide. These three studies had samples quite similar to the respondents of this study; they were Malaysian students with a multicultural background. Apart from that, the Report from the Household Income Surveys 2009 (Department of Statistics, Malaysia, 2011, July) by the Economic Planning Unit, Prime Minister's Department Malaysia, was also used to categorise socioeconomic status into two categories namely high and low socioeconomic status.

Based on the report of the Household Income Surveys, it was found that the average income of Malaysian was RM4,025. The average high socioeconomic status income per month is RM9,987, and the average low socioeconomic status income average was RM1,440. Using this as a guide, high income was categorised as earning above the average income, and low income was categorised as earning below the average income in this study. Thus, the socioeconomic status data in this study was organised into two categories namely the low, and the high socioeconomic status.

In the Malaysian context, the father's occupation had been found to be the best index of the family's socioeconomic status (Gan, 1998; Palaniappan, 1994; Yong, 1986). Yong (1986) categorised socioeconomic status into two categories that were high and low socioeconomic status. As such, the father's occupation and mother's occupation together with their highest educational level were obtained as additional information to assist in assigning the samples to the socioeconomic status categories.

Based on the above statements, the high socioeconomic status category in this study consists of professionals such as lawyers, doctors, accountant, and graduate teachers with income of RM4,000 and above. Parents who are government officers, small businessman, and teachers in the primary school are categorised under low socioeconomic status. Others such as both parents with form five qualifications, with one working parent, and pensioners from the non-graduate scale were placed in low socioeconomic status category.

Ochse (1990) in Heilman (2005) found that most people who exhibited exceptional creativity came from professional backgrounds. The professional class, in general, values intellectual and artistic pursuits, encourages talented people and strongly believes in the value of cultural stimulation as well as education. In this study, parents who are professionals were placed in the high socioeconomic status category.

3.3.2 Musical Activity Involvement Questionnaire

The researcher devised the Musical Activity Involvement questionnaire based on studies by Auh (1995) and Laycock (1992). The questionnaire consists of two parts (1) formal musical activity involvement and (2) informal musical activity involvement. The first part on formal musical activity involvement aims at gathering information from the trainee teachers about their participation in musical activities, such as band, orchestra, choir, gamelan groups, wind band, ensemble recorder and private lesson. The trainee teachers were also required to state the formal activities they were involved in other than the above list. They were asked the number of years they have participated in the musical activity. In total, the trainee teachers were asked about participation in seven kinds of musical activities and the minimum score would be zero if they did not participate in any of them.

The informal musical activity involvement questionnaire asked trainee teachers about musical activities they have done with friends, family and on their own. The informal musical activity involvement listed in the questionnaire were as follows: watching TV, listening to CDs, or MP3, listening to the radio, singing, making up a song, dancing, playing musical instruments and going to a concert. The total score for informal musical activity involvement ranged from 0 to 9 where one point was assigned to each kind of informal musical activity involvement that has a "Yes" response. The informal musical activity involvement was not considered in this study due to the similarities of the results. Most of the trainee teachers had 9 points for informal musical activity involvement. Hence, only the data of formal musical activity involvement were analysed in this study.

3.3.3 Self-Esteem of Musical Ability

Schmitt (1979) developed the Self Esteem of Musical Ability measure. Many researchers (Auh, 1995; Austin, 1990; Draves, 2008; Laycock, 1992; Randles, 2010) have used this instrument to measure musical self-esteem of students. However, only a few researchers have used Self Esteem of Musical Ability to study the relationships between musical self-esteem and musical creativity (Auh, 1995; Austin, 1990; Laycock, 1992).

Borg and Gall (1983) defined self-concept as a set of feelings that each person has and Coopersmith (1981) cited self-esteem as an important determinant of school performance. According to Randles (2010), self-esteem is a person's personal perception of his or her level of ability or acceptance in any given area.

The Self Esteem of Musical Ability questionnaire consists of a series of statements about the respondents' current and future musical behaviours. The questionnaires have 43 items and it is a music specific self-concept measure. The items in the Self Esteem of Musical Ability are in three categories that are (a) self-perception of music ability, 17 items, (b) support and recognition by others, 18 items, and (c) personal interest and desire, 8 items. The items, in the form of statements, asked for information regarding respondents' own self-confidence in music, musical skills and abilities, and behaviours of parent, teachers, and friends concerning their perceptions of the musical ability. Respondents evaluated themselves in relations to the statements. A four-Likert scale comprising strongly disagreeing, disagree, agree and strongly agree was used. The Self Esteem of Musical Ability was translated into *Bahasa Melayu* by the researcher and two experts in the language proofread and verified the translation. Some of the statements were adjusted to make the questionnaire more applicable to pre-service trainee teachers.

3.3.4 Aural Discrimination Tests

The researcher modified and adapted the Aural Discrimination Test from Colwell's Music Achievement Tests used by Webster (1979) and Auh (1995). According to Auh, Colwell's Music Achievement Test is for students in third grade through college level. It consists of four tests. The first test consists of pitch discrimination, interval discrimination and meter discrimination; while the second test comprises major-minor mode discrimination and feeling for tonal centre. Test Three consists of tonal memory, melody recognition, pitch recognition and instrument recognition and in the fourth test, chord recognition and cadence recognition are tested. In Auh's (1995) study, only test one was used based on reasons such as appropriate for upper elementary students, high reliability of the test and appropriate length of time for administration. Furthermore, test one covered the areas that the respondents have learnt in Auh's (1995) study.

The researcher adapted the Colwell's Music Achievement Test and developed items according to the content learnt by the trainee teachers in the Bachelor of Teaching in Music Education program. There were six tests in the Aural Discrimination Test, namely of pitch discrimination, interval discrimination, meter discrimination, cadence recognition, auditory-visual discrimination and major-minor mode discrimination. These items were chosen for this study because of the following reasons: (1) the items were appropriate for measuring the trainee teacher's aural skills based on the content of the course pro forma of the program, and (2) Aural Discrimination Test took about 40 minutes to administer, which was considered reasonable for this testing situation.

The first component in the aural discrimination test is pitch discrimination. Pitch discrimination abilities were measured using three tests of ten items each. Using three tones and five tones that were similar, a second, a third and a fourth apart, the listener was to find the highest, lowest and similar pitch.

The second component is interval discrimination. In the interval discrimination section, the listener was required to find the second and third pitch sounded after they were given the first pitch. There were ten items in both sections. Section 1 required the listener to write in solfege the second pitch sounded. Section 2 required the listener to write the degree of scale for two pitches sounded after the given first note.

Meter discrimination is the third component of aural discrimination test. Feeling for the metrical pulse is a skill that has been advocated since at least the turn of the century according to Colwell (1970). Hence, there were ten items in recognition of pulse. The listeners were expected to be able to recognise duple and triple time from a short melody played.

The fourth component is mode discrimination. There are ten items in the major and minor mode differences section. Though many think this difference is no longer important according to Colwell, the ability to describe mode and chords are commonly used in the syllabuses of the bachelor of education program.

The fifth component of aural discrimination is auditory-visual discrimination. Auditory-visual discrimination was included as an indicator of music reading ability. The ability to follow the line of a short melody and ability to identify the wrong pitch was measured here. Music reading is one of the most important skills taught in this bachelor of teaching programmes. This is the one ability that is most valued by the trainee teachers.

Last, the sixth component of aural discrimination is cadence recognition. The ability to recognise a cadence required the trainee teachers to listen harmonically. The melody and chords were played in a short extract of four bars and the last two chords were played in full strongly. The trainee teachers were required to identify the cadence of the last two chords. In all, there were six components and 130 items in the Aural Discrimination Test.

Aural Discrimination Test was conducted as a group test. The trainee teachers were given an answer sheet to fill up. The answer sheet was set according to the progression of the test. With the help of a piano, the researcher sounds each item twice and a time of 10 seconds per item was given for trainee teachers to write the answers on the answer sheet. All the items were given one mark; hence, the total marks for Aural Discrimination Test is 130 points.

3.3.5 The Composition Test

The Composition Test measures musical creativity in composition. The trainee teachers were required to compose a melody using the keyboard or digital piano. The final product, which is the music composition, was evaluated.

There is no standard system for evaluating musical characteristics of trainee teacher's original melodies for song analysis. Therefore, the constructs used in this study to measure the composition were based on the literature reviewed (refer to Chapter 2).

The measure of creativity has been heavily influenced by Guilford's hypothesis that creative thinking consists of divergent thinking factors along with several other factors posited in his Structure of Intellect Model presented in 1967 (Kiehn, 2000). Torrance's widely used Tests of Creative Thinking are based on Guilford's hypothesis and measure the divergent thinking factors of fluency, flexibility, elaboration and originality. Guilford's work also shaped the assessment of musical creativity (Webster, 1977). The influence of Guilford and Torrance is apparent in most studies of musical creativity in which some or all aspects of the divergent factors are used to score musical responses in order to assess musical creativity (Baltzer, 1990; Schmidt & Sinor, 1986; Vaughan, 1971; Void, 1986; Webster, 1977, 1994). The divergent factors considered to measure musical creativity in compositions in this study are influenced by the factors in figural creativity in Torrance's (2008) study.

There are various method and constructs used to measure musical creativity in composition. Some of the constructs used were based on previous studies. For example, Laycock's (1992) constructs in measuring musical creativity follows the measurement developed by Kratus (1989) and Webster (1979). The constructs are the creative use of tonality, meter, cohesiveness, originality, complexity, motive and phrasing in a composition.

In this study, the constructs suggested by Auh (1995) were used to measure musical creativity. Auh (1995) has five dimensions in her measurement on compositional creativity. The dimensions are craftsmanship, musical syntax, musical originality, musical sensitivity and repetition of song.

Other than the dimensions of Auh's study, the researcher had included other components to be measured based on the suggestions and review of literature on creativity (Amabile, 1977; Kratus, 1994; Nelly, 2006; Webster, 1977). Therefore, there are four categories of dimensions chosen for the composition ratings in this study namely Creative Dimension, Technical Goodness, Aesthetic Appeal, and repetition of song.

The Creative Dimension consists of Musical Fluency, Musical Originality, Musical Elaboration, Musical Resistance to Premature Closure and Musical Abstractness of Title. The second dimension is Technical Goodness, which consists of craftsmanship and musical syntax. Aesthetic appeal which consists of only one component that is musical sensitivity is the third dimension. Musical sensitivity measures the musical expression in the composition. Repetition of songs is considered as the fourth dimension. Repetition of song is the degree to which the second playing of the composition is the same as the first playing of the composition. The overall musical creativity score is the combined score of these four dimensions.

The dimensions chosen were based on reviews of the literature on creativity in general and also literature on musical creativity. Amabile (1983) suggested that products such as composition be rated not only for creativity but also for technical goodness and aesthetic appeal for the purposes of achieving discriminate validity. Judges' assessment of creativity should not influence the perceptions of technical goodness or aesthetic appeal. This ensures that judges do not rate a composition highly creative because it appealed to them or because the composers possess great technical ability.

In the composition test, a time limit was given to the trainee teachers and within that given time, they were required to compose an original composition. The time limit was given based on reasons found in prior research (Auh, 1995; Kratus, 1989; Laycock, 1992; Reinhardt, 1990) and for practical reasons. Auh (1995) gave 10 minutes to elementary children to practice to make up a song. Laycock (1992) gave 20 minutes of practice time to the high school students because they had a longer attention span compared to elementary students. Auh (1995) mentioned in her study that fourth-grade students were able to finish making up a song in less than 10 minutes. From the pilot study conducted by the researcher, a time limit of 15 to 20 minutes was found to be comfortable with the trainee teachers. Only a handful of the sample in the pilot study needed more than 20 minutes. Hence, in this study, a minimum 10 minutes and maximum 20 minutes were given to the trainees teacher. The time limit ensured a degree of consistency among the respondents for time spent composing.

In addition, though the composition test only requested for a melody line, with no harmony, the trainee teacher was allowed to compose with harmony. The trainee teachers were asked to compose a melody because song or melody is the first composition of the majority composers according to Bennett (1976).

Besides that, there are some rules and procedures read to the trainee teachers prior to the Composition Test.

First, the trainee teachers were told that there was no length of requirement fix in the composition such as number of bars. The trainee teachers were reminded that they were required to play their composition twice at the end of the session. Second, the starting note was fixed to middle C. This means that the first note played has to be middle C. Third, only the melody is needed but harmony can be included if they feel comfortable to compose with both hands. Fourth, the time limit given was 20 minutes.

In addition, the trainee teachers were informed that the whole process of composition would be recorded on video. While each trainee teacher was creating their compositions, the researcher left the practice room as not to build any tension to the trainee teacher but the video recording was switched on throughout the whole session. A clock was placed near the keyboard or digital piano to assist each trainee teacher of the time limit. The guideline informed each of the respondents the time limit of 15 to 20 minutes. According to Amabile (1977), the only way to avoid decrements in creativity during evaluation is to give specific creativity guidelines to respondents.

Amabile (1996) proposed that the most valid way to measure creativity is by using experts' global and subjective assessment of creative products. This method is labelled consensual assessment technique. This technique requires judges to rate the creativity of an artistic product by using their own subjective definition rather than any given objective criteria or checklist. The rating in the rating form reads on a scale of 1 to 7, and using their own subjective definition of creativity, the judges rate the degree to which the composition is creative. Amabile theorizes that the interjudge reliability of consensual assessment by experts is the equivalent of construct validity. It was found that the reliability figures were consistently high in review of studies using consensual assessment for rating the creativity.

In addition, according to Baer & McKool (2009), Consensual Assessment Technique is a powerful tool used by creativity researchers to rate the creativity of creative products. The best measure of creativity of a work of art is to use the combined assessment of experts in that field. Baer and McKool further stressed that the Consensual Assessment Techniques is not based on any particular theory of creativity, which means that its validity is not dependent upon the validity of any particular theory of creativity. In a composition study conducted by Reinhardt (1990), three judges were used to rate songs composed by 35 fifth-grade students. Baltzer (1988) had two judges, the researcher and a certified elementary school teacher to examine the reliability of the Measures of Creativity in Sound and Music. In this study, the judges were selected based on their expert ability and availability. The composition was assessed using a 7-point rating scales as used by Auh (1995), Balzter (1988), Nelly (2006), Barker (2003), Yannon (2011), and Hickey (2001).

In this study, selected four judges conducted an interjudge assessment of 30 compositions. The Amabile Consensual Assessment Technique was adopted where the judges underwent a brief introductory explanation of the dimensions in the composition score sheet. The judges were instructed to judge each composition relative to each other and not against some arbitrary or personal standard of creativity. On the first listening, the judges rated the creativity dimension. On the second listening, judges rated the technical goodness and aesthetic appeal. Lastly judges were encouraged to listen numerous times to rate the repetition of composition.

Yannon (2011), states that when a consensual assessment technique is used, the interjudge reliability represents the validity of the measure. The reliability is equivalent to construct validity. If appropriate judges independently agree that a given product is highly creative, then it can and must be accepted as such (Amabile, 1983).

3.3.6 Torrance Test of Creative Thinking

The Torrance Test of Creative Thinking is by far the most popular means for assessing creativity in psychological and educational research (Amabile, 1977). Many researchers in the west (Craig & Cohen, 1999; Hlasny, 2008; Kiehn, 2000, 2003; Russo, 2004; Squeglia, 1994; Struthers, 2008; Vaughan, 1971; Webster, 1979; Wolff, 1979) and in Malaysia (Chia, 1998; Palaniappan, 2005; Singh, 2011; Siti Rafiah, 2008; Yong, 1986; Yong, 1994) used the Torrance Test of Creative Thinking to measure general creativity. Torrance Test of Creative Thinking consists of two different types of test that are the Verbal and the Figural Tests. For this study, only the Figural Torrance Test of Creative Thinking Form A was administered. The Verbal Test requires more than an hour of testing time, not including the time required for giving instruction. Hence, due to time constrain, Verbal Test was not included in this study. Lengthy sessions of testing can cause tiredness and disrupt the time schedule for teaching and the institute administrators discourage this.

The Figural Torrance Test of Creative Thinking: Thinking Creatively with Pictures requires various types of drawings as responses and is designed to assess divergent creative thinking abilities. The mental characteristics of fluency, elaboration, originality, resistance to premature closure and abstractness of titles are assessed (Torrance, 2008). This test has been constructed to be interesting and challenging for individuals at all educational levels, that is, from kindergarten through adult via individual or group administration. In this Figural Test, there were three paper and pencil activities and it took 10 minutes per activity for a total of 30 minutes to complete the whole test. The trainee teachers were asked to use their imaginations to think of ideas and put them together in various ways. They were encouraged to build upon their idea so that it would tell the most imaginative and exciting story. The figural activities were (a) picture construction, (b) picture completion and (c) parallel lines. All the three activities of the Figural Test Form A were used in this study. The following is the description of each activity.

Activity 1 is a picture construction test. The stimulus object is an oval shape. Each trainee teacher was asked to think of a picture, which he/she could draw with the shape as a part of the picture. They were encouraged to make up an interesting story that no one else would think of. When the picture was completed, a title of the picture was to be given. Originality, elaboration and abstractness of title were measured in activity 1. This activity sets in motion the tendency towards finding a purpose for something that has no definite purpose and to elaborate it so that a purpose is developed (Torrance & Ball, 2008).

Activity 2 is a picture completion test. This test consists of ten incomplete figures. The trainee teachers were required to sketch some interesting and unusual objects or pictures by adding lines to the incomplete figure. At the end of each picture, the trainee teachers were required to give a title for each picture. They were again encouraged to sketch some interesting objects or pictures that no one else would think of. Fluency, originality, elaboration, premature closure and abstractness of title were measured in activity 2. This activity called into play the tendency toward structuring and integrating and gave an opportunity for in-depth presentation of a single object, scene or situation (Torrance & Ball, 2008). An incomplete figure challenged the trainee teachers hence created tension. The trainee teachers needed to control this tension long enough to make the mental leap to get away from the obvious and commonplace. Failure to do so would result in premature closure of the incomplete figures.

Activity 3 is also a picture completion test, which consists of thirty pairs of straight lines. The trainee teachers were encouraged to complete as many objects as possible by placing marks between the lines, on the lines, and outside the lines in order to make a picture no one else would think of. The trainee teachers then wrote a title below the picture. In this activity, there was a deliberate attempt to stimulate fluency, originality and elaboration.

The above activities are scored according to figural fluency, figural originality, figural elaboration, figural resistance to premature closure, and figural abstractness of title. Figural fluency score is the number of ideas a person expresses through interpretable responses that use the stimulus in a meaningful manner. The essence of the idea may be expressed through the title, but the stimuli must still be used. Abstract designs without meaningful titles are not counted (Torrance & Ball, 2008). Figural originality scoring is based on the statistical infrequency and the unusualness of the response. Figural elaboration has two assumptions in its scoring. The first assumption is the minimum and the primary response to the stimulus figure is a single response. The second assumption is the ability to imagine and the function of exposition in detail. Therefore, in the scoring of elaboration, credit is given for each pertinent detail added to the original stimulus figure and it must be meaningful. Figural resistance to premature closure scoring is based on the ability to keep open and delay closure long enough to make a mental leap that makes the original ideas possible. According to Torrance and Ball (2008), a less creative person tends to leap to conclusion prematurely without considering the available information. Scoring for the figural abstractness of title is based on the ability to produce good titles that involve the thinking processes of synthesis and organization.

Yong (1986) conducted an inter-scorer reliability, a method adopted from Torrance. One scorer scored all of the responses from the 397 pupils on both forms of the Torrance Test of Creative Thinking (BV). Subsequent to that, another scorer based on the same instructions from the manual scored 50 sets of these responses on each of the two forms. An inter-scorer of 0.95 and 0.94 were obtained for the figural and verbal forms respectively. This gives further evidence for the reliability of the Torrance Test of Creative Thinking instrument.

Torrance Test of Creative Thinking bilingual version (BV) from A consisting of both the verbal and figural tests was used to study the creativity of form four students in 1986 by Yong in Malaysia. Test-retest reliability obtained by Yong for figural originality, elaboration, fluency and flexibility were 0.85, 0.79, 0.76 and 0.79 respectively and significant at $p < 0.001$. The test-retest reliability of overall figural creativity was found to be 0.83. This result matched the findings stated in the scoring guide (Torrance & Ball, 2008) where similar studies were carried out in the United States of America. From these results, it can be summarized that the Torrance Test of Creative Thinking figural was consistent with the test retest reliability reported by Torrance and reliable in obtaining stable responses from the respondents.

Chia (1998) validated Torrance Test of Creative Thinking in his study the content validity, construct validity, concurrent validity and predictive validity. Inter-scorer reliability coefficients were found to be between 0.90 and 0.99.

In 1994, Ananda Palaniappan conducted Yong's bilingual version of the Torrance Test of Creative Thinking figural form (Palaniappan, 1994). The test-retest reliability for figural originality, elaboration, fluency and flexibility were 0.85, 0.79, 0.76 and 0.79 respectively. The inter-scorer reliability was 0.95. Both the figural and verbal tests were scored based on the directions manual and scoring guides provided by its author. Each respondent obtained five figural creativity scores namely figural fluency, figural originality, figural elaboration and a composite figural creativity score.

In this study, the researcher obtained the Figural TTCT: Thinking Creatively with Pictures from the Scholastic Testing Service, Inc through online order. The Figural TTCT Streamlined Scoring and the Figural TTCT Norms-Technical Manual together with the scoring sheet were sent to the researcher.

3.4 Pilot Study

According to Chua (2012), the definition of reliability is the capability of the research in obtaining the same value when measurements are repeated (p. 261). In the case of the instruments used in this study, the reliability of each instrument is ensured through the pilot study.

Prior to the actual data collection, a pilot study of the Torrance Test of Creative Thinking, Self-esteem of Musical Ability, Aural Discrimination Test, and Composition Test were undertaken to ascertain the reliabilities and validities of the instruments. The pilot study was conducted for the purpose of eliciting preliminary information about the data collection process and the validity and reliability of the instruments used. The findings obtained from the pilot study especially those concerning the weaknesses in the implementation and content were used to make improvements. A revision in instructions, test items or response format was carried out based on the feedback received during the pilot testing.

The selection of the participants in the pilot study was based on their similarity to the respondent of the study. The pilot study was conducted on twenty-one year four trainee teachers in a teacher training institution in an urban area. Seven boys and fourteen girls participated in this pilot study. The demographic questionnaire, Aural Discrimination Test, Self Esteem of Musical Ability, and the Torrance Test of Creative

Thinking were carried out in the morning session. In the afternoon, participants were evaluated using the Composition Test individually. The researcher administered the pilot test. All the data collected were analysed for its reliabilities.

3.4.1 Pilot Study of the Self-Esteem of Musical Ability

The Self Esteem of Musical Ability was conducted on 21 trainee teachers who underwent the similar program as the respondents of this study. A test retest procedure was carried out to determine the reliability of the instrument (Chua, 2012). The retest of Self Esteem of Musical Ability was carried out 3 days after the first administration as suggested in Schmitt's (1979) study. In this pilot study, the Pearson's correlation was used to look at the correlation between each item in the test retest results of Self Esteem of Musical Ability. The Pearson's correlation was used because the data of Self-esteem of Musical Ability are in ratio scale.

It was found that the inter-correlation index of items in Self Esteem of Musical Ability was between .71 to .90, which is considered as strongly correlated. According to Kinnear & Gary (2009), this result represents high reliability. The internal consistency of Self Esteem of Musical Ability was analysed and the Cronbach alpha reliability was .96.

Previous researchers have conducted reliabilities analysis on the Self-esteem of Musical Ability. For example, Schmitt (1979) administered Self Esteem of Musical Ability to 83 seventh-grade students with a time interval of three days between the two administrations. The reliability index of Self Esteem of Musical Ability in Schmitt's study was .91 (Auh, 1995; Austin, 1990). Laycock (1992) also used the Self-Esteem of Musical Ability measure in his study with high school students and found the split-halves reliability to be .93. Austin (1990) used Self Esteem of Musical Ability in his study with upper elementary students and found the reliability of Self Esteem of

Musical Ability was .94. Hence, the reliability index found in this pilot study can be considered similar to previous studies.

Other than reliability analysis, Schmitt (1979) conducted a construct validity analysis on Self Esteem of Musical Ability. Schmitt administered Self-Esteem of Musical Ability to 173 students ages 10 to 15 and asked them to describe their subjective opinion on their musical ability. Three judges evaluated the subjective descriptions and the scores were correlated using Pearson's correlation. The interjudge reliability of the judges ranged from .76 to .86.

Therefore, the analyses on the reliability and validity reported above suggested that the Self-Esteem of Musical Ability measure by Schmitt is a reliable tool to measure musical self-esteem and hence it is used in this study.

3.4.2 Pilot Study of the Aural Discrimination Test

The Aural Discrimination Test was pilot tested to 21 trainee teachers who had similar characteristic as the respondents of this study. A test retest was carried out with an interval of 30 days between the administrations of the two tests. Pearson product-moment correlation analysis was used to analysed the correlation between the first and the second tests. It was found that the correlation between these two tests was .98.

Aural Discrimination Test is a researcher generated test. In order to look at the content validity of the Aural Discrimination Test, the course end results of the Aural & Sight Singing I and II courses (MZU3101 and MZU3109) learned by the trainee teachers in year one and year two were used in comparison. Validity is defined as "the correlation value between measurement and the true value of a variable" (Chua, 2012, p. 258). Hence, the content of researcher generated Aural Discrimination Test was compared to the content of courses learnt so that the measurement of the Aural Discrimination Test represents the content aspect.

Table 3.10

Content Validity of Aural Discrimination Test in Comparison with Aural and Sight Singing Course End Results

Independent Variables	Correlation Coefficient	
	Aural and Sight Singing I Year 1	Aural and Sight Singing II Year 2
Aural Discrimination Test	.58**	.72**

Note. **Correlation is significant at the .01 level (2-tailed).

The correlation between the test and retest score were calculated using Pearson product-moment correlation. The correlations are shown in Table 3.10. It was found that the results of the Aural Discrimination Test have significant correlations with both Aural and Sight Singing I course (r = .58, p < .01) and Aural and Sight Singing II course tests results (r = .72, p < .01).

3.4.3 Pilot Study of Torrance Test of Creative Thinking

A test-retest analysis was carried out three months after the first administration of the Torrance Test of Creative Thinking. A group of 20 trainee teachers who participated in the earlier pilot test were involved. As shown in Table 3.11, the test-retest reliability for figural fluency, figural originality, figural elaboration, figural resistance of premature closure, and figural abstractness of title are .76, .84, .63, .72, and .66. All these coefficients are significant at p < .01 level.

The Torrance Test of Creative Thinking is deemed reliable in its ability to obtain stable responses from the respondents. According to Hilton, Brownlow, and McMurray, (2004), the reliability coefficient value that is bigger than .50 is considered satisfactory reliability. Furthermore, this result matched the findings of Yong (1986) and hence responses of the respondents are considered stable.

Table 3.11

Test-Retest Reliabilities for Torrance Test of Creative Thinking

Variables	Figural FLU	Figural ORI	Figural ELA	Figural RES	Figural ABS	Figural Creativity Index
Figural Fluency	.76**					
Figural Originality		.84**				
Figural Elaboration			.63**			
Figural Resistance to Premature Closure				.72**		
Figural Abstractness of Title					.66**	
Figural Creativity Index						.90**

Note. **Correlation is significant at the .01 level (2-tailed).
FLU: Fluency ABS: Abstractness of Titles
ORI: Originality RES: Resistance to premature closure
ELA: Elaboration

3.4.4 Changes Made after the Pilot Study

After the pilot study was conducted, the information generated was used to make decisions to modify the instruments. Firstly, the sequence of the procedure needed to be changed because participants found it too tedious to complete so many instruments in the morning. In the actual study, only the demographic questionnaire, and Self-Esteem of Musical Ability were conducted continuously. The Aural Discrimination Test and Torrance Test of Creative Thinking was conducted a day after.

Secondly, some items in Aural Discrimination Test needed to be modified. For example, the length of the extract for meter discrimination was too short. The pilot group found it difficult to identify the meter in such a short length. The length of each item was then extended to four bars.

Thirdly, in the composition test, the length of time, which was 30 minutes, was found to be a bit too long because participants started to fiddle with other things such as playing with their hand phone or daydreaming. After a short discussion with the participants, the length was changed to 20 minutes.

3.5 Reliability Analyses for the Respondents in the Study

The data obtained in this study were subjected to several reliability analyses. First, the interjudge reliability coefficient of the Torrance Test of Creative Thinking was calculated. Then, the interjudge reliability coefficients for dimension scores and composite scores of the Composition Test were presented. Because each dimension and composite scores of composition test were derived by averaging the four judges' ratings, interjudge reliabilities were calculated using the Pearson product-moment correlation.

3.5.1 Interjudge Reliabilities for General Creativity

Following the method adopted by Yong (1994) and Torrance and Ball (2008), an interjudge reliability of the Torrance Test of Creative Thinking was computed on the responses for the respondents of the study. All the responses of the 159 trainee teachers were scored by one scorer and 20 sets of these responses were scored by another scorer based on the same instructions from the manual. An interjudge reliability for the figural creativity and components are reported in Table 3.12. Pearson product-moment correlation was used to compute the interjudge reliabilities. Pearson product-moment correlation was used because the data of the Torrance Test of Creative Thinking were in ratio scale.

The analysis shows that the interjudge reliability for figural fluency was .96, for figural originality was .69, for figural elaboration was .80, for figural resistance to premature closure was .87 and for figural abstractness of title was .81. As for the overall figural creativity which was the creativity index, the Pearson product-moment coefficient was .87. The interjudge reliabilities of the figural creativity in the study were lower than Yong (1994), which was .95. However, the results of the correlation (r = .69 to .96) were considered strong and satisfactory (Chua, 2008).

Table 3.12

Interjudge Reliability for General Creativity

Dimension	Interjudge Reliability (Judge 1 – Judge 2)
Figural Fluency	.96**
Figural Originality	.69**
Figural Elaboration	.80**
Figural Resistance to Premature Closure	.87**
Figural Abstractness of title	.81**
Creativity Index	.83**

Note. **Correlation is significant at the .01 level (2-tailed).

3.5.2 Interjudge Reliabilities of Composition Dimensions

Four independent judges listened to the final compositions. Three judges are male composers who have composed songs for competitions and one judge is a female instrumental teacher. All judges are educators in the teacher education institution. The judges were selected based on their interest in the study, availability and their expert abilities.

Each judge received a Composition Score Sheet and the recording of 30 compositions. Judges did not confer with any other judges nor did the researcher train them prior to judging. A composition rating instruction was given to all judges as a guide to the terms of definitions. Judges were directed to listen to all of the compositions once without rating them on any dimension. This is because the Consensual Assessment Technique requires judges to rate creative products or processes in relation to other samples in the group and not against a pre-determined criterion for creativity.

The reliability of each of the rating scale measures was analysed using the Pearson Product-Moment correlation formula with the mean of the judges' score. Table 3.13 shows the interjudge reliabilities of the four judges.

Table 3.13

Interjudge Reliabilities for the Components of Composition

Dimension	Interjudge Reliability						
	J1-J2	J1-J3	J1-J4	J2-J3	J2-J4	J3-J4	Median
Musical Fluency	.94	.92	.69	.87	.69	.60	0.79
Musical Originality	.90	.87	.78	.83	.65	.61	0.77
Musical Elaboration	.89	.90	.72	.89	.68	.72	0.80
Musical Resistance to premature closure	.86	.91	.61	.88	.56	.63	0.74
Musical Abstractness of Title	.81	.77	.71	.87	.69	.75	0.77
Craftsmanship	.84	.90	.81	.86	.71	.80	0.82
Musical Syntax	.91	.87	.70	.81	.68	.78	0.79
Musical Sensitivity	.84	.92	.69	.81	.74	.71	0.79
Repetition of Song	.74	.67	.76	.84	.79	.76	0.76
Overall Musical Creativity	.97	.96	.86	.95	.85	.87	0.91

Note. J1-Judge 1; J2-Judge 2; J3-Judge 3; and J4-Judge 4; All of the data are significant at $p < .05$

The median is used as the central tendency where the median interjudge reliabilities were .79 for Musical Fluency, .77 for Musical Originality, .80 for Musical Elaboration, .74 for Resistance to Premature Closure, .77 for Abstractness of Title, .82 for Craftsmanship, .79 for Musical Syntax, .79 for Musical Sensitivity, and .76 for Repetition of Song. The median interjudge reliability for the Overall Musical Creativity was .91. According to Jackson (2011), the correlation coefficients of .70 to .99 are considered very strong relationships.

3.5.3 Reliability Index of Measurements

The reliability index of independent and dependent variables are shown in Table 3.14. The Cronbach alpha of the data collected from the Self-esteem of Musical Ability questionnaire, the Aural Discrimination Test, and the Composition Test were .93, .83, and .94 which all have satisfactory reliability. As for the Torrance Test of Creative Thinking, the Cronbach alpha values were. 62.

Table 3.14

Internal Consistency Reliability of the Independent and Dependent Variables

Measurement of Independent Variables	Cronbach Alpha Reliability	Split-Half Reliability
Self-esteem of Musical Ability questionnaire	.93	.93
Aural Discrimination Test	.83	.83
Measurement for Dependent Variables		
Composition Test	.94	.85
Torrance Test of Creative Thinking	.62	.62

Split-halves reliabilities of Self-esteem of Musical Ability measure and Aural Discrimination Test were computed with Pearson product-moment correlation and corrected by the Spearman-Brown Prophecy Formula. Split-halves reliability for Self-Esteem of Musical Ability is .93. The reliability for Self-Esteem of Musical Ability is higher than Auh (1995) (r = .70). In addition, the reliability index is similar to those found by Schmitt (1979) (r = .91), Laycock (1992) (r = .93) and Austin (1990) (r = .94). Split-halves reliabilities of the Aural Discrimination Test of this study is .83 which is higher than the reliability found by Auh (1995) (r = .75). In summary, the split-halves reliabilities of the measures of self-esteem of musical ability and Aural Discrimination are considered satisfactory.

3.6 Data Collection Procedures

The entire study encompassed approximately 6 months. A pilot study was conducted prior to the actual field study involving a separate sample of teacher trainees. Letters requesting permission to carry out the study were sent to the Educational Planning and Research Division and the Teacher Education Institute, Ministry of Education Malaysia. The data collection procedure began after receiving approvals from the directors of the seven teacher education institutions. The permission from the respondents was also requested.

The procedure of the study was carried out in three sessions as shown in Figure 3.1. In session 1, the trainee teachers were given a demographic questionnaire. Information concerning characteristic of the trainee teachers such as age, gender, ethnicity, keyboard skills during enrollment in the institutions, and parents' academic level and income were collected. This session took around 15 minutes. Following that, the Musical Experience questionnaire was administered. This session also took around 15 minutes. Subsequently, the Self Esteem of Musical Ability questionnaire was carried out. All these activities were conducted in a classroom in the respective institutions. The respondents involved in the study were seated in a classroom position.

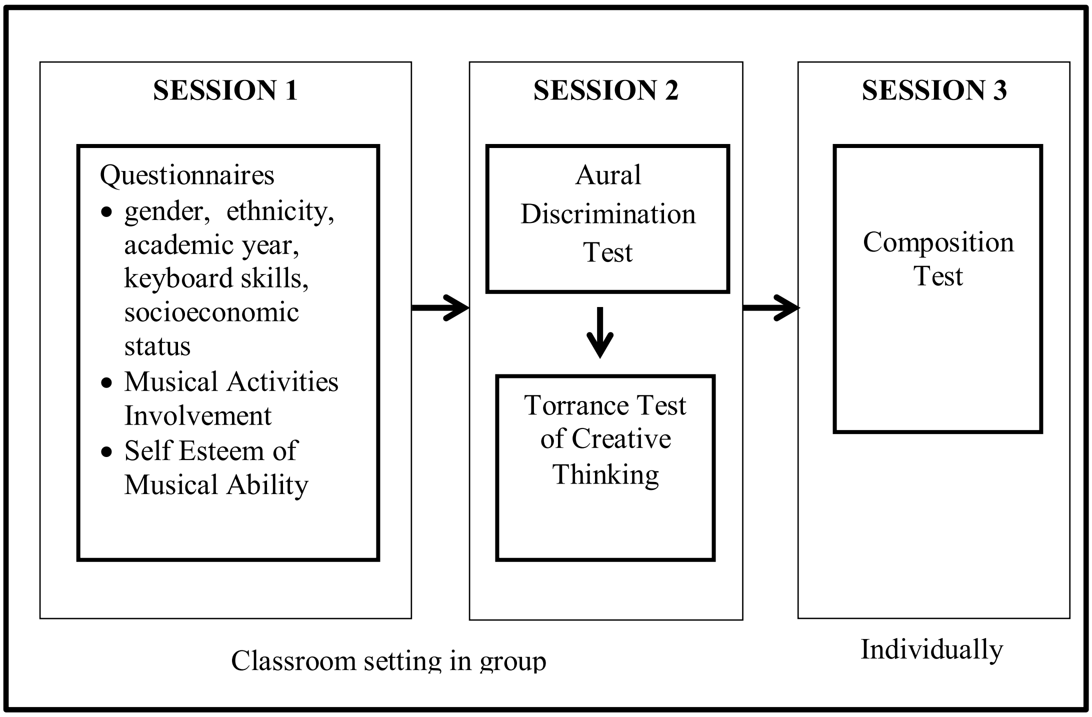


Figure 3.1. Procedure of Data Collection

Session 2 was carried out the next day where the Aural Discrimination Test and Torrance Test of Creative Thinking were administered. The time taken for Aural Discrimination Test was approximately 45 minutes and the time taken for the Torrance Test of Creative Thinking was approximately 40 minutes. Before the administration of the Torrance Test of Creative Thinking, a break was given to the students to minimise test fatigue. Both tests were administered in-group and the respondents were seated in a classroom manner.

Session 3 was the Composition Test. The researcher administered the entire test. In the Composition test, the trainee teachers were individually assessed following the test procedure. The test was conducted in a small soundproof room that has a digital piano or a keyboard. Each respondent was given 20 minutes to compose a music composition using the digital piano or keyboard. Responses of the test tasks were videotaped and later were audio taped for scoring by four independent judges.

3.6.1 Procedure of Questionnaires

In the first session, three questionnaires were administered. The questionnaires were the demographic questionnaire requesting for information about age, gender, ethnicity, keyboard skills, and parents' educational background and income. The second questionnaire asked for the trainee teacher's musical experience. The third questionnaire was the Self-Esteem of Musical Ability. All the questionnaires were carried out in a group setting. The seating position was the same as the Aural Discrimination Test and the Torrance Test of Creative Thinking. The researcher administered the process of data collection. At the end of each session, the researcher collected back the questionnaires answered.

3.6.2 Procedure of the Aural Discrimination Test

The Aural Discrimination Test was carried out in a group. All the respondents were seated in a room with tables arranged in an examination manner. In the room, there was a piano. Respondents were given an answer sheet. All the items in the tests were carried out by the researcher according to the following sequence (a) Pitch

Discrimination, (b) Interval Discrimination, (c) Meter Discrimination, (d) Cadence Recognition, (e) Auditory-Visual Discrimination, and (f) Major-Minor Mode Discrimination. Every item on each test was sounded twice on the piano. The trainee teachers answered on an answer sheet provided. At the end of each test, the researcher collected the answer sheets. The testing time was approximately 45 minutes.

3.6.3 Procedure of the Torrance Test of Creative Thinking

The Torrance Test of Creative Thinking was carried out in a group setting. The seating position was the same as the setting for Aural Discrimination Test. The Torrance Test of Creative Thinking was administered in accordance with the published instructions set by the Scholastic Testing Service (Torrance & Ball, 2008). The figural test took around 40 minutes. Prior to test administration, trainee teachers were given instructions that will motivate them to think creatively and to reduce stress from taking a test as suggested by Torrance and Ball (2008). Torrance strongly believed that examiners needed to give the students an explicit permission to have fun.

This test consisted of three activities and each activity required ten minutes to complete. Activity 1 was a picture construction test where the respondents were given a picture of a curved oval shape. The respondents were required to think of a picture, which can be drawn with the shape as a part. Respondents were encouraged to think of a picture that no one has thought off to elicit original response. Respondents were also encouraged to add on ideas as to make the picture as interesting and as exciting as possible. A title was needed upon completion of the picture.

Before the respondent continued with Activity 2, the researcher gave a short instruction as stated in the instruction manual (Torrance & Ball, 2008). In Activity 2, there were ten incomplete figures and they were required to sketch some interesting and unusual objects or pictures by adding lines to the incomplete figure. Upon completion, respondents gave an interesting title for each drawing.

As in activity 2, the researcher gave a short instruction before activity 3 begins. Activity 3 was entitled Repeated Figures Activity. There were thirty pairs of short straight lines and the respondents were asked to sketch the maximum possible objects using the straight lines as the main elements of the designs. Names or titles were given for each picture upon completion. At the end of the test, the researcher collected all the answer sheets.

3.6.4 Procedure of the Composition Test

The Composition Test was carried out individually in a soundproof music practice room. Each respondent was given a maximum of 20 minutes and a minimum of 10 minutes to create an original composition. A limited time for time spent on composing is necessary to ensure the degree of consistency among the respondents (Kratus, 1989; Reinhardt, 1990).

Before the test began, the respondents were explained the rules and procedure of the test. First, the respondents were told that the length of the composition was limited to not more than 3 minutes. Then they were informed that they were required to play their composition twice at the end of the test. Following that, the starting note of the composition was fixed to middle C (Laycock, 1992), and no harmony was required. However, the respondents were allowed to harmonise the melody if they prefer to do so. Then, the respondents were reminded that they were given 20 minutes to organise and compose an original composition. The word original were emphasised. Last, the respondent was informed that he or she would be alone in the room during the composition process. However, the entire process of composing was video recorded.

After the explanation of the rules and procedures of the composition test, the video was switched on and the researcher requested the respondent to say his or her name. With that, the researcher left the room. After completion of the composition, the researcher entered the room and requested the respondent to perform his or her composition twice. According to Kratus (1989, 1994, 2001) the replication of the composition is a sign of internalizing the composition and not mere improvisation at the keyboard. The composition test ends after the respondent named a suitable title for his or her composition.

3.7 Data Analysis

The quantitative data collected from the respondents were analysed using the analysis below. The analysis for each research question is depicted in Figure 3.2.

Quantitative data gathered for this study were (1) the Compositional Test, (2) the Torrance Test of Creative Thinking figural Form A, (3) the Self-Esteem of Musical Ability scores, (4) the Aural Discrimination Test, and (5) the Musical Activity Involvement scores. Other than that, demographic information such as age, gender, ethnicity, keyboard skills, and parents' educational background and income were gathered from the demographic questionnaires.

Ratings of the two judges on the Torrance Test of Creative Thinking and four judges of the Composition Test were correlated with one another to determine the inter-coder reliability. The researcher scored the Aural Discrimination Test and the Self Esteem of Musical Ability.

3.7.1 Data Analysis of the First Research Question

To investigate the musical exposure of the trainee teachers, descriptive statistic of the data of keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability were examined. Keyboard grades were nominal data and musical activity involvement, aural discrimination, and self-esteem of musical ability were in ratio scale. The descriptive statistic using frequency counts, percentages, means, and standard deviations were employed.

3.7.2 Data Analysis of the Second Research Question

Descriptive statistics and inferential statistics were used to investigate the relationships between keyboard grades and personal variables. Considering that gender, ethnicity, academic year, socioeconomic status and keyboard grades are nominal data, non-parametric test was employed (Chua, 2012; Jackson; 2011).

The relationships between gender and keyboard grades and the relationships between socioeconomic status and keyboard grades were analysed using frequency, percentage, and Mann-Whitney U test. Mann Whitney u test were employed because gender (male and female) and socioeconomic status (high and low) had two samples in each variable.

The relationships between ethnicity and keyboard grades, and the relationships between academic years and keyboard grades were analysed using frequency, percentage, and Kruskal-Wallis test. Kruskal-Wallis test was employed to compare differences within the groups.

3.7.3 Data Analysis of the Third Research Question

Descriptive statistics and inferential statistics were used to investigate the relationships between musical activity involvement and personal variables. Musical activity involvement is considered in ratio scale, hence inferential statistic that were *t*-test, one-way ANOVA and Tukey HSD were used to determine whether significant differences exist between musical activity involvement and personal variables of the trainee teachers.

The relationships between gender and musical activity involvement and the relationships between socioeconomic status and musical activity involvement were analysed using mean, standard deviation, and *t*-test. The *t*-test was employed because gender (male and female) and socioeconomic status (high and low) had two samples in each variable.

The relationships between ethnicity and musical activity involvement, and the relationships between academic years and musical activity involvement were analysed using one-way ANOVA and Tukey HSD to compare differences within the groups.

3.7.4 Data Analysis of the Fourth Research Question

Descriptive statistics, independent sample *t*-test, one-way ANOVA, and Tukey HSD were used to investigate the relationships between aural discrimination and personal variables. The relationships of gender and socioeconomic status with aural discrimination were analysed using independent sample *t*-test. This is because gender (male and female) and socioeconomic status (high SES and low SES) have two samples in their scores.

The relationships of ethnicity and academic years with aural discrimination were analysed using one-way ANOVA and to compare differences within groups, the application of Tukey HSD is used. Ethnicity (Malay, Chinese, other ethnic groups), academic years (year one, year two, year three, year four), and academic years (year one, year two, year three, and year four) had more than two samples in their scores hence, one-way ANOVA and Tukey HSD are suitable.

3.7.5 Data Analysis of the Fifth Research Question

Similar to data analysis of the fourth research questions, this research question also used descriptive statistics, independent sample *t*-test, one-way ANOVA, and Tukey HSD to investigate the relationships between self-esteem of musical ability and personal variables.

The relationships of gender and socioeconomic status with self-esteem of musical ability were analysed using mean, standard deviation, and independent sample *t*-test. This is because gender (male and female) and socioeconomic status (high SES and low SES) had two samples in their scores.

The relationships of ethnicity and academic years with self-esteem of musical ability were analysed using one-way ANOVA. To compare differences within groups of personal variables, the application of Tukey HSD was used. The above personal variables had more than two samples in their scores hence one-way ANOVA and Tukey HSD are suitable.

3.7.6 Data Analysis of the Sixth Research Question

To investigate the nature of the creative abilities of the Malaysian trainee teachers, a descriptive statistics of the overall musical creativity and the overall general creativity for the whole sample were looked into. The means, standard deviations, medians, minimums and maximums of musical creativity and general creativity were calculated. Following that, a descriptive analysis was carried out on the nine components of musical creativity namely musical fluency, musical originality, musical elaboration, musical resistance to premature closure, musical abstractness of title, craftsmanship, musical syntax, musical sensitivity and repetition of song. Likewise, a descriptive analysis was carried out on the five components of the Torrance Test of Creative Thinking namely figural fluency, figural originality, figural elaboration, figural resistance to premature closure, and figural abstractness of title. As a result, the patterns of performances of the components of musical creativity and general creativity were discovered.

3.7.7 Data Analysis of the Seventh Research Question

Pearson Product-Moment Correlation was used to investigate the inter-correlation of the components of musical creativity. Likewise, Pearson Product-Moment Correlation was used to determine the inter-correlation of the components of general creativity. Following that, the relationships among the components in the musical creativity and general creativity were analysed using Pearson Product-Moment Correlation.

Pearson Product-Moment Correlation was used to analyse correlations of musical creativity and general creativity because the data were in ratio scale. According Kinnear and Gray (2009), Pearson Product-Moment Correlation is suitable to measure strength of association between variables in ratio scale.

3.7.8 Data Analysis of the Eighth Research Question

To investigate the relationships between musical creativity and personal variables descriptive statistics, independent sample *t*-test, one-way ANOVA, and Tukey HSD were employed.

The relationships of gender and socioeconomic status with musical creativity were analysed using mean, standard deviation, and independent sample *t*-test. This is because gender (male and female) and socioeconomic status (high and low) had two samples in their scores.

The relationships of ethnicity and academic years with musical creativity were analysed using one-way ANOVA. To compare differences within groups of personal variables, the application of Tukey HSD was used. The above personal variables had more than two samples in their scores hence one-way ANOVA and Tukey HSD are suitable.

3.7.9 Data Analysis of the Ninth Research Question

Similar to data analysis of the eighth research questions, this research question also used descriptive statistics, independent sample *t*-test, one-way ANOVA, and Tukey HSD to investigate the relationships between general creativity and personal variables.

The relationships of gender and socioeconomic status with general creativity were analysed using mean, standard deviation, and independent sample *t*-test. This is because gender (male and female) and socioeconomic status (high and low) had two samples in their scores.

The relationships of ethnicity and academic years with general creativity were analysed using one-way ANOVA. To compare differences within groups of personal variables, the application of Tukey HSD was used. The above personal variables had more than two samples in their scores hence one-way ANOVA and Tukey HSD are suitable.

3.7.10 Data Analysis of the Tenth Research Question

To investigate the relationships between musical creativity and musical exposures descriptive statistics, one-way ANOVA, Tukey HSD, and Pearson Product Moment Correlation analysis were employed.

The relationships of keyboard grades and musical creativity were analysed using mean, standard deviation, and one-way ANOVA test. To determine significant differences within groups, the Tukey HSD was employed.

The relationships between musical creativity and musical exposure variables namely musical activity involvement, aural discrimination, and self-esteem of musical ability were analysed using Pearson Product Moment correlation. Pearson Product Moment correlation is used because musical creativity, musical activity involvement, aural discrimination, and self-esteem of musical ability are ratio data.

3.7.11 Data Analysis of the Eleventh Research Question

Similar to research question ten, descriptive statistics, one-way ANOVA, Tukey HSD, and Pearson Product Moment Correlation analysis were employed to investigate the relationships between general creativity and musical exposures.

The relationships of keyboard grades and general creativity were analysed using mean, standard deviation, and one-way ANOVA test. To determine significant differences within groups, the Tukey HSD was employed.

The relationships between general creativity and musical exposure variables namely musical activity involvement, aural discrimination, and self-esteem of musical ability were analysed using Pearson Product Moment correlation. Pearson Product Moment correlation is used because general creativity, musical activity involvement, aural discrimination, and self-esteem of musical ability are ratio data.

3.7.12 Data Analysis of the Twelfth Research Question

Stepwise multiple regression analysis was used to analyse the predictors for musical creativity and general creativity. The criterion variables were musical creativity and general creativity. The predictor variables were musical exposures (keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability). The predictors were entered systematically, one at a time until no other variables would make a significant contribution to the prediction equation. Following that, the hierarchical multiple regression analysis was used to analyse the predictors for musical creativity and general creativity after eliminating personal variables.

3.8 Summary

This study investigates the musical exposures and the relationships between variables in musical exposures (keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability) and variables of creativity (musical creativity and general creativity). In addition, the nature of creativity and its relationships with personal variables were examined. The study also investigates the predictors of musical creativity and general creativity. A correlation design was adopted to collect quantitative data. The respondents of the study were 159 pre-service trainee teachers randomly selected from seven teacher education institutions.

The instruments used to collect data included demographic questionnaire, musical experience questionnaire, self-esteem of musical ability questionnaire, the Aural Discrimination Test, the Torrance Test of Creative Thinking, and the Composition Test. Besides that, the academic grades were obtained from the examination unit of each institution. Pilot testing of the instruments indicated reasonable validity and reliability.

Data were collected in three sessions. The questionnaires were administered in the first session. In the second session, the Aural Discrimination Test and the Torrance Test of Creative Thinking were conducted. The last session is the Composition Test, which needed individual evaluation.

The data were analysed quantitatively using the SPSS programme. Descriptive statistic such as frequency, percentage, mean and standard deviation were employed. The Mann-Whitney U test and the Kurskal Wallis test were employed to investigate the relationships between nominal data that were personal variables and keyboard grades. The one-way ANOVA, and Tukey HSD, were used to investigate relationships between personal variables and creativity, and between personal variables and musical exposures (musical activity involvement, aural discrimination, and self-esteem of musical ability). Pearson Product Moment Correlation was used to determine relationships between musical creativity and general creativity. To determine the best predictor for musical creativity and its components, multiple regression analysis and hierarchical multiple regression analysis were used.

The next chapters discusses the results of the analysis. The results are presented according to the eleven research questions. A summary is presented at the end of each research question.

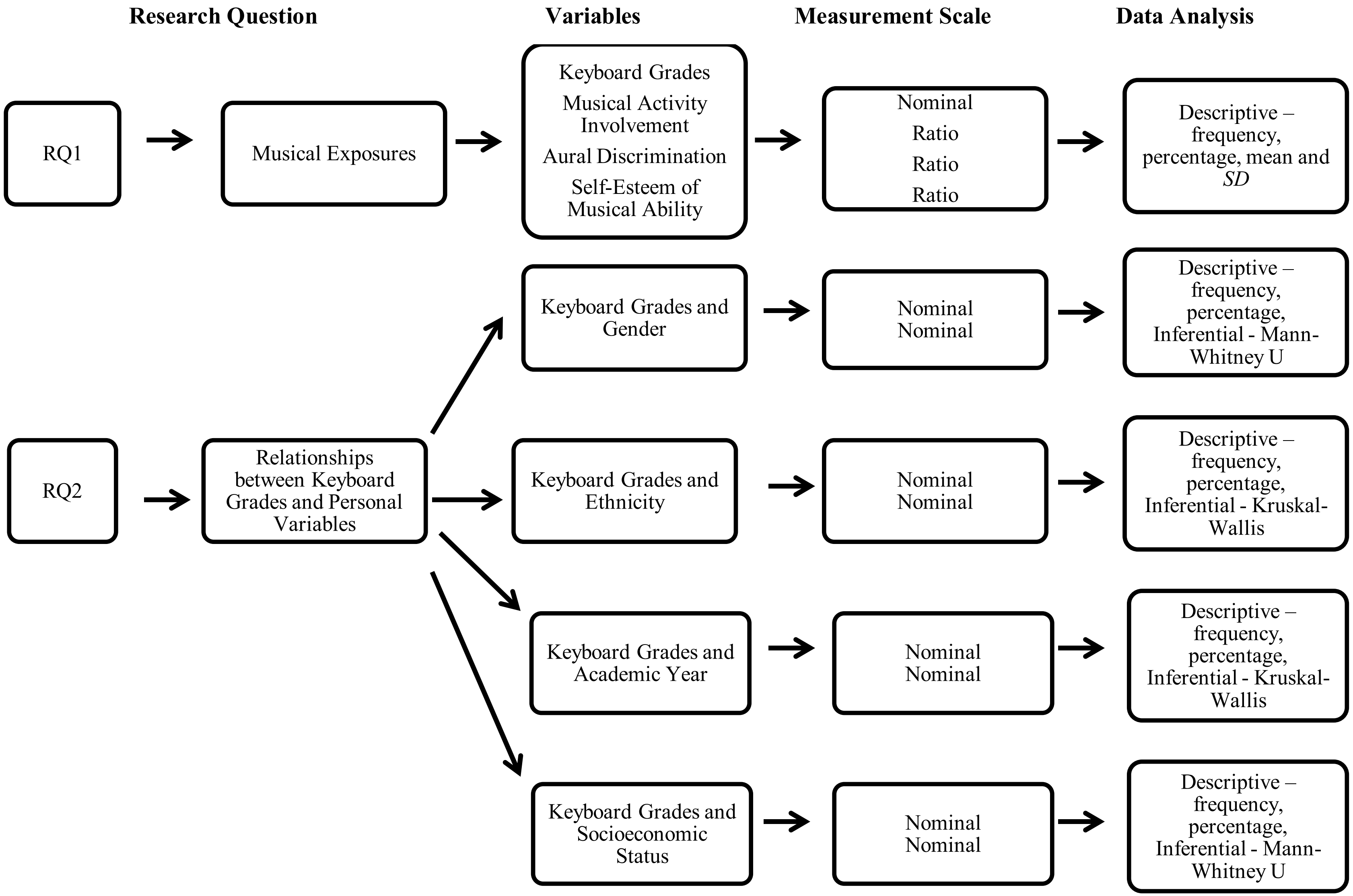
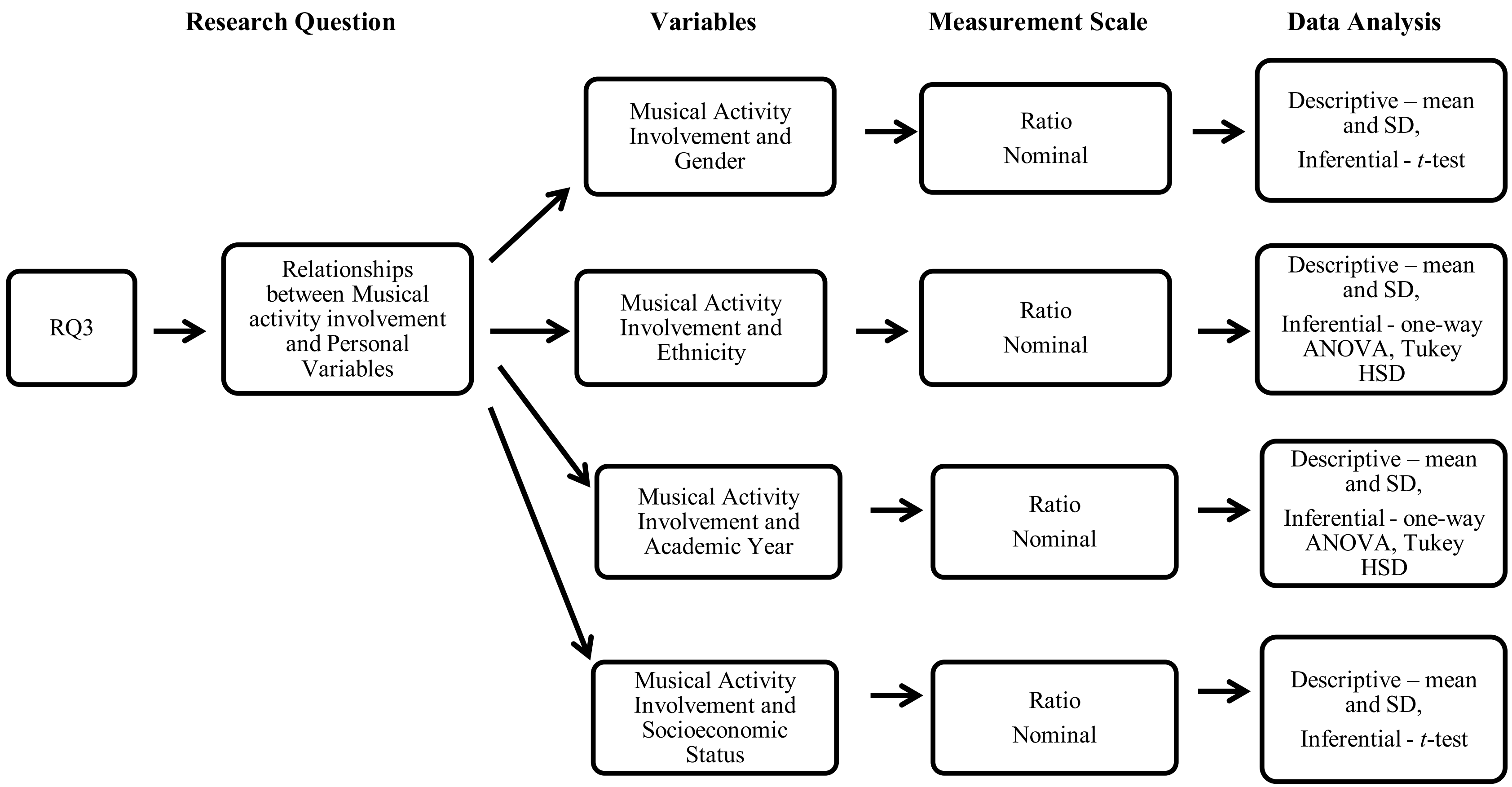


Figure 3.2. Summary of Data Analysis Based on the Research Questions …(*continues*)



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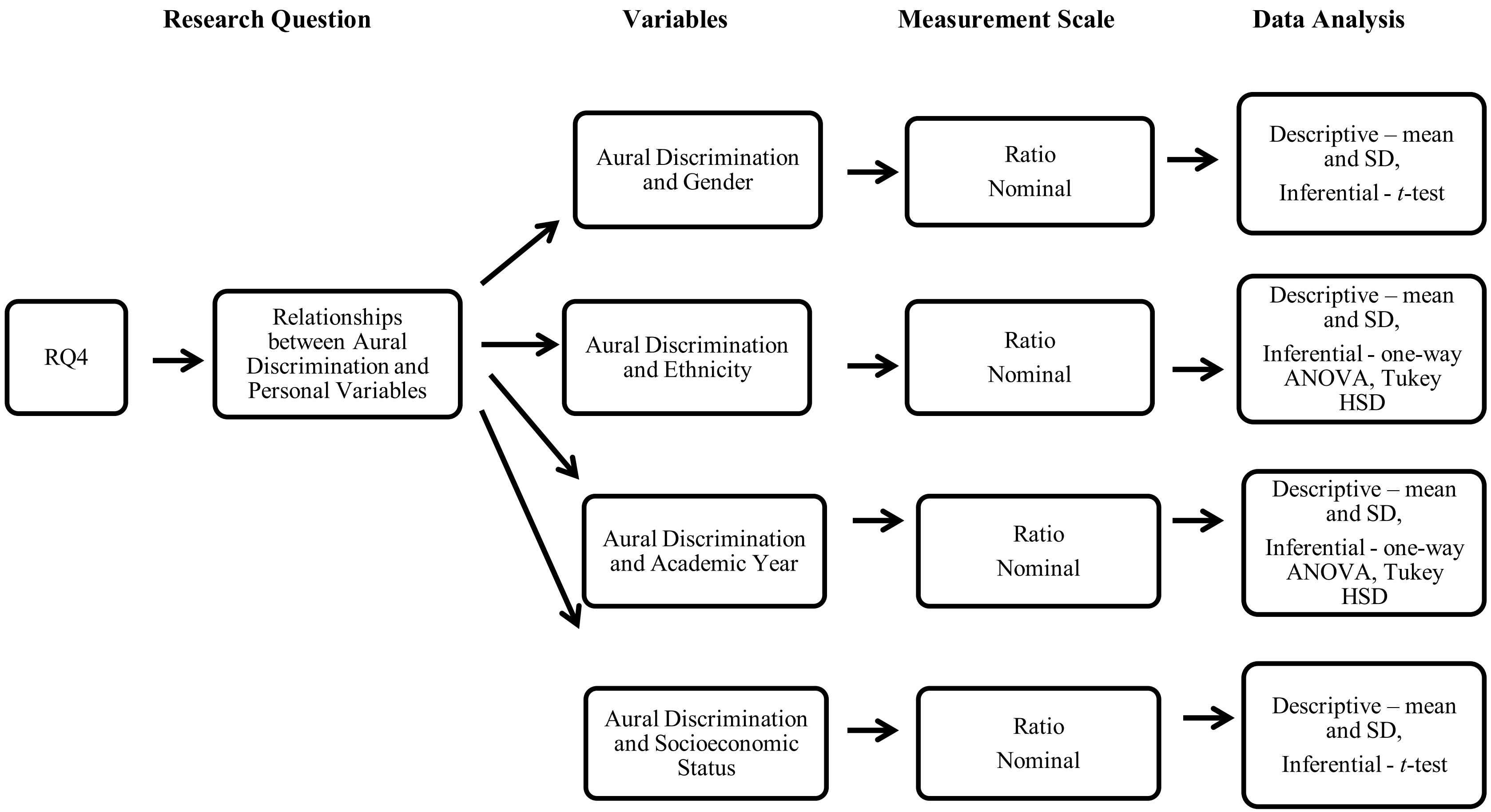

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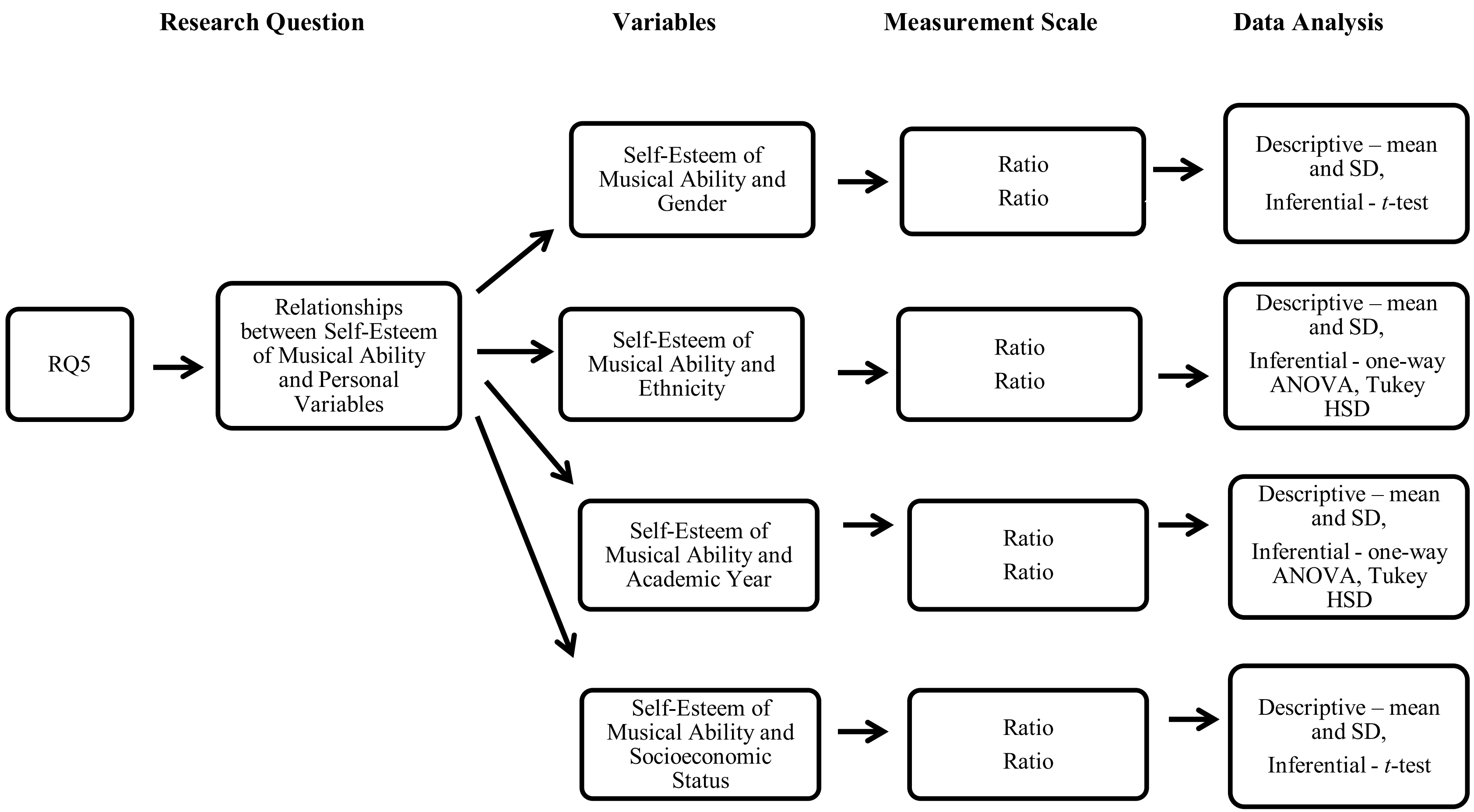

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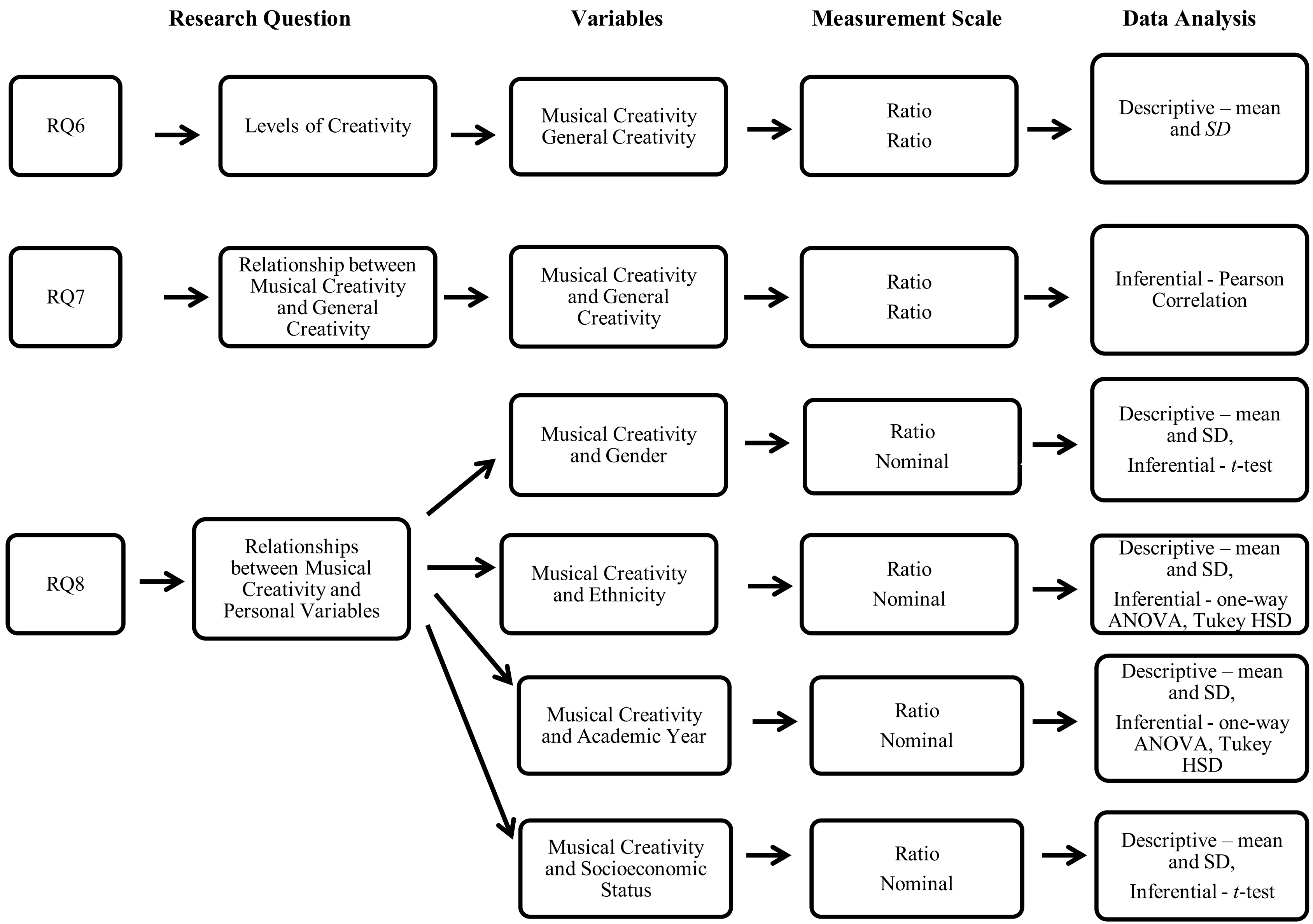

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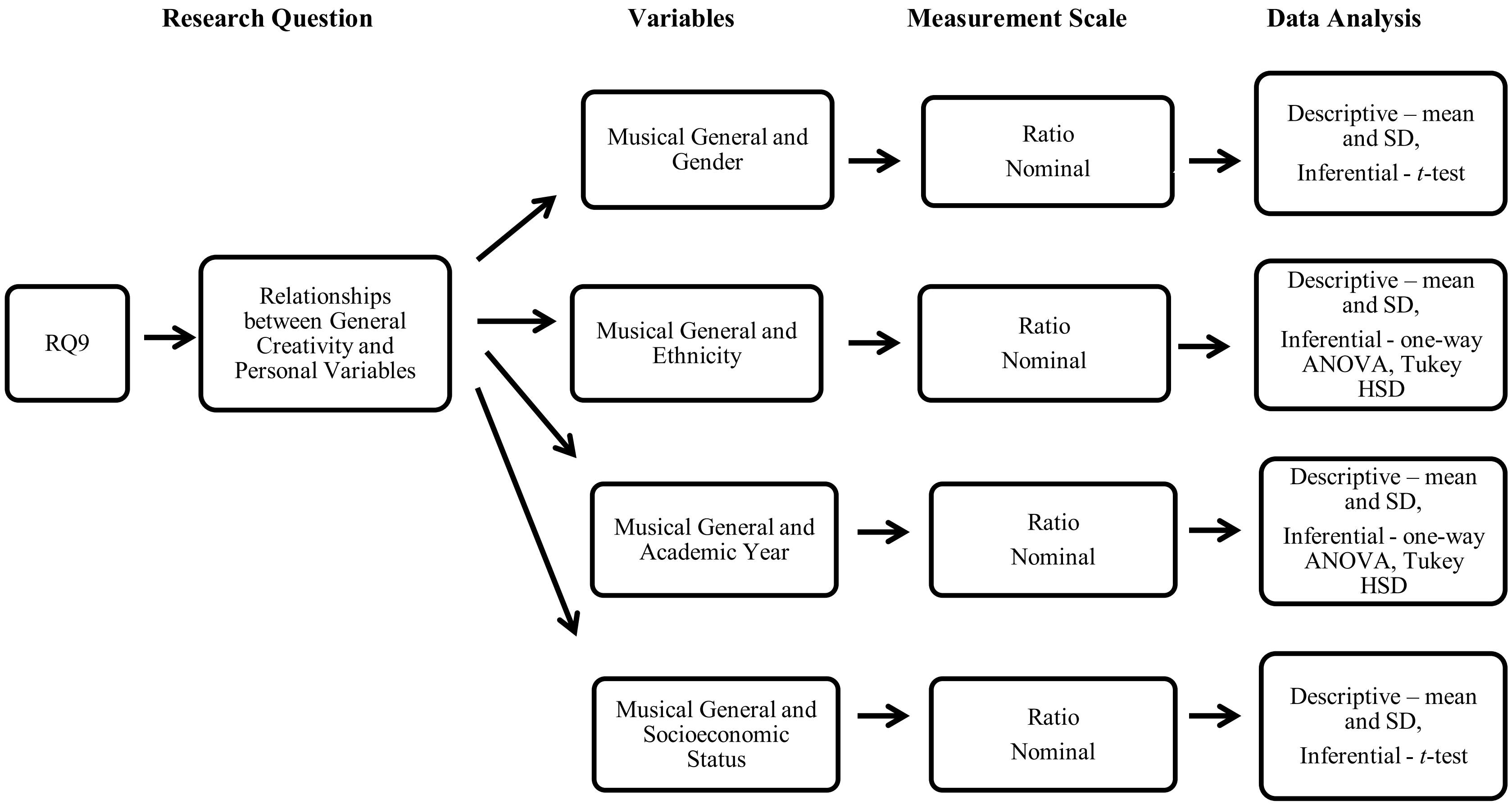

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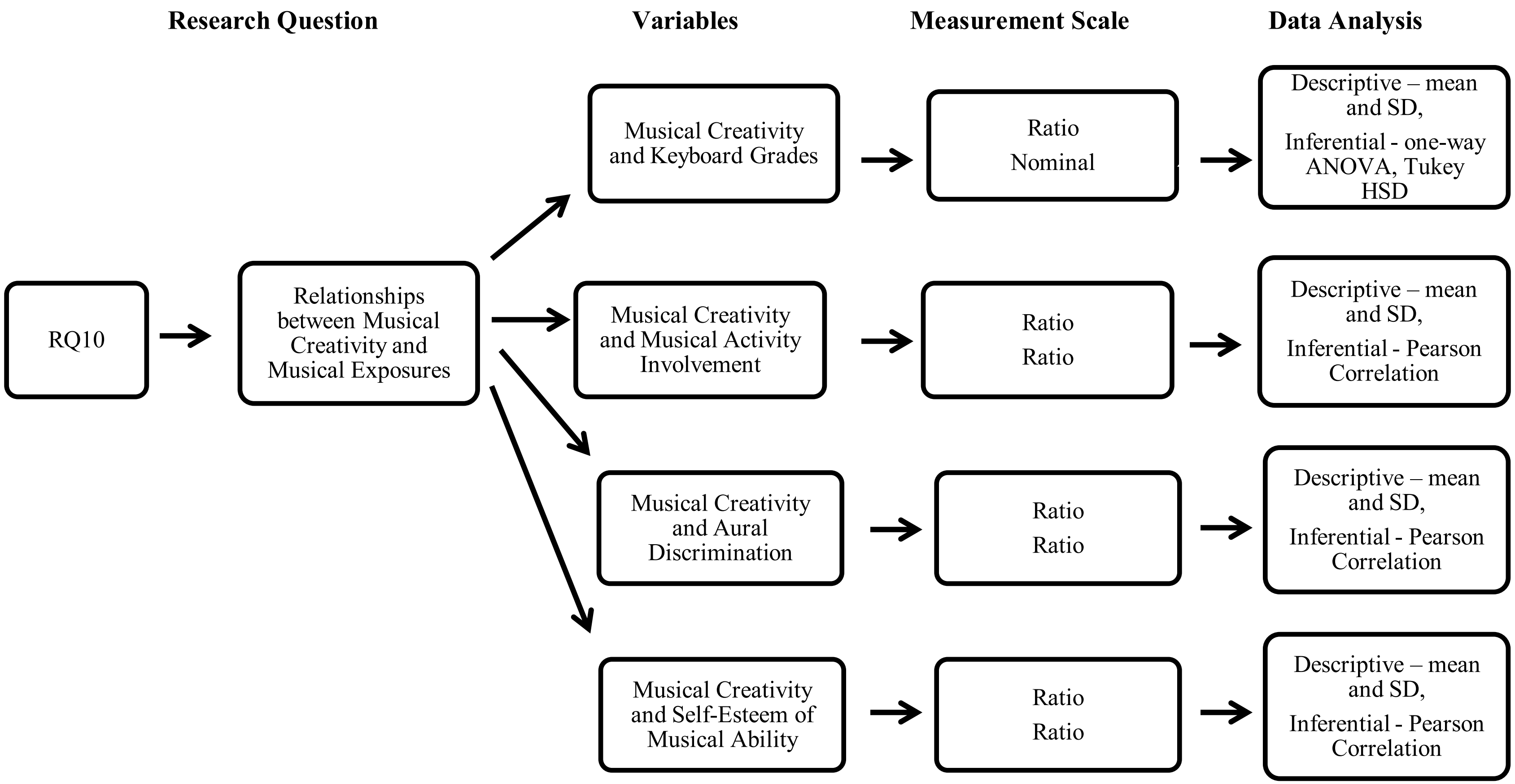

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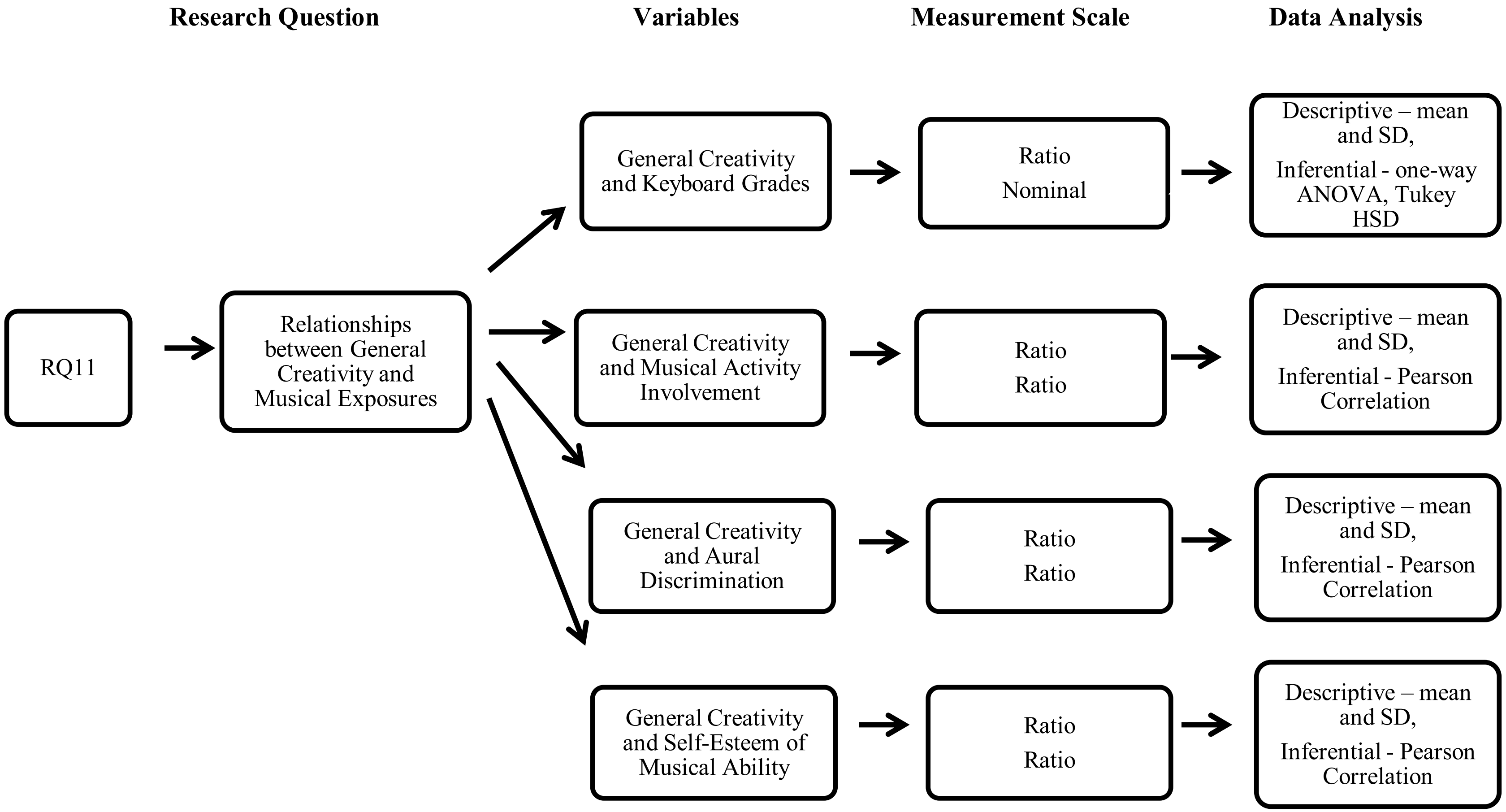

Figure 3.2. Summary of Data Analysis Based on the Research Questions …(*continues*)

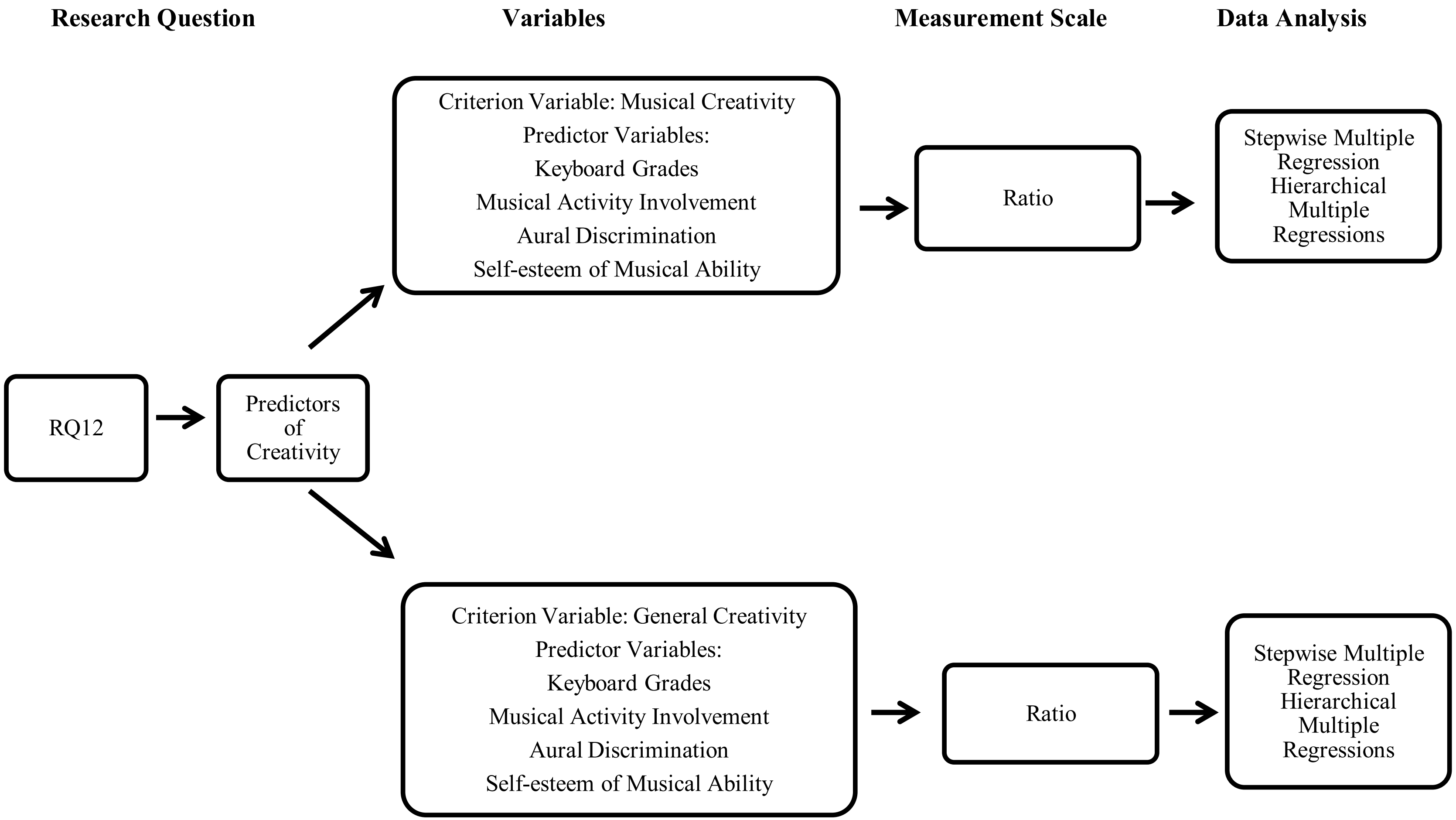

Figure 3.2. Summary of Data Analysis Based on the Research Questions

CHAPTER 4

RESULTS

In this chapter, the results of all data analyses are organised according to the research questions and reported under the following subheadings.

The first section elicits the preliminary analysis of the profiles of the trainee teachers in terms of gender, ethnicity, academic years, and socioeconomic status. The second section reports the musical exposures of the trainee teachers. Following that, the relationships between musical exposures and personal variables are analysed. The next section examines the nature of musical creativity and general creativity. Following that is the presentation of the relationships between musical creativity and general creativity and their respective components.

Subsequently, the relationships between musical creativity and personal variables and the relationships between general creativity and personal variables are presented. Following that, the relationships between musical creativity and musical exposures and the relationships between general creativity and musical exposures are presented. The final section reports the predictors of musical creativity and general creativity.

The independent variables are personal variables and musical exposures. Personal variables are gender, ethnicity, academic years, and socioeconomic status. Musical exposures are keyboard grades, musical activity involvement in and out of the institution, aural discrimination, and self-esteem of musical ability. The dependent variables are musical creativity and general creativity.

Two types of statistical techniques were used to analyse the data namely descriptive statistic and inferential statistic. Descriptive statistics comprised frequency, percentage, mean and standard deviations were used to analyse data relating to musical exposures of the trainee teachers (research question 1). Descriptive statistics were also used to determine the pattern of performance of musical creativity and general creativity (research question 6).

Inferential statistic for the non-parametric data such as the Mann-Whitney U test and Kruskal-Wallis test and for the parametric data such as *t*-test, one-way ANOVA, and Pearson Product Moment Correlation test were used to analyse the relationships of the variables. Besides that, data were also analyse with multiple regressions and hierarchical multiple regression analysis.

To determine the influences of personal variables among keyboard grades, Mann-Whitney U test, and Kruskal-Wallis test were used (research question 2). To determine the influences of personal variables among musical activity involvement, aural discrimination, and self-esteem of musical ability, *t*-test, one-way ANOVA and Tukey HSD were used (research question 3, 4, and 5).

Pearson Product Moment Correlation test was used to examine the relationships between musical creativity and general creativity (research question 7). To determine the significant differences between musical creativity and personal variables, *t*-test, one-way ANOVA and Tukey HSD were used (research question 8). Similarly, *t*-test, one-way ANOVA and Tukey HSD were used to analyse significant relationships between general creativity and personal variables (research question 9).

Following that, the relationships between creativity and musical exposures were analysed with one-way ANOVA, Tukey HSD, and Pearson Product Moment Correlation (research question 10 and 11).

In the final section, the stepwise multiple regression was used to predict the amount of variance contributed by each of the independent variables in influencing musical creativity and general creativity. The section ends with the hierarchical multiple regression analysis to determine the predictors of musical creativity and general creativity when the personal variables were eliminated (research question 12).

The significance level for all the statistical tests was set at $p < .05$. Effect sizes were calculated using Cohen's (1988) d to determine the degree of change.

4.1 Preliminary Analysis

Personal variables in this study consisted of variables such as gender, ethnicity, academic years, and socioeconomic status of the trainee teachers. Gender, academic years, ethnicity, and socioeconomic status were nominal data (Chua, 2008). Thus, in order to describe the distributions of trainee teachers according to these personal variables, descriptive statistic such as the frequency and percentage were employed.

4.1.1 Profile of Respondents in Terms of Gender and Academic Years

Table 4.1 presents the descriptive data of the male and the female trainee teachers of this study. There were 51 male trainee teachers and 108 female trainee teachers participated as respondents. In total, there were more female trainee teachers (67.92%) than male trainee teachers (32.08%).

The distribution of gender by academic years as shown in Table 4.1 indicates that in year one, there were four male trainee teachers and 19 female trainee teachers. In year two, there were 13 male trainee teachers and 16 female trainee teachers. In year three, there were 14 male trainee teachers and 31 female trainee teachers and in year four, there were 20 male trainee teachers and 42 female trainee teachers.

Table 4.1

Distribution of the Respondents according to Gender and Academic Years

Variables	Academic Years				
	Year 1 *n* %	Year 2 *n* %	Year 3 *n* %	Year 4 *n* %	Total *n* %
Gender					
Male	4 (2.5)	13 (8.2)	14 (8.8)	20 (12.6)	51 (32.1)
Female	19 (12.0)	16 (10.0)	31 (19.5)	42 (26.4)	108 (67.9)
Total	23 (14.5)	29 (18.2)	45 (28.3)	62 (39.0)	159 (100)

4.1.2 Profile of Respondents in Terms of Ethnicity

The people in Malaysia are made up of a diverse culture and ethnicity. The trainee teachers came from various parts of Malaysia and have different cultural background. Table 4.2 shows the distribution of the trainee teachers according to their ethnicity. The ethnicity of the trainee teachers was made up of 74 Malays, 67 Chinese, four Indians and 14 from other ethnic groups such as Iban, Kadazan, Dusun, Bidayuh, and Bajau.

The data showed that in year one, there were seven Malay trainee teachers, 15 Chinese trainee teachers, and one Indian trainee teacher. In year two, there were 19 Malay trainee teachers, eight Chinese trainee teachers, and two trainee teachers from the other ethnic groups. In year three, there were 19 Malay trainee teachers, 19 Chinese trainee teachers, three Indian trainee teachers, and four trainee teachers from the other ethnic groups. In year four, there were 29 Malay trainee teachers, 25 Chinese trainee teachers, and eight trainee teachers from the other ethnic groups.

Table 4.2

Distribution of the Respondents According to Ethnicity

Variables	Academic Years				
	Year 1 *n* %	Year 2 *n* %	Year 3 *n* %	Year 4 *n* %	Total *n* %
Ethnicity					
Malay	7 (4.4)	19 (12.0)	19 (12.0)	29 (18.2)	74 (46.6)
Chinese	15 (9.4)	8 (5.0)	19 (12.0)	25 (15.7)	67 (42.1)
Others	1 (.6)	2 (1.3)	7 (4.4)	8 (5.0)	18 (11.3)
Total	23 (14.5)	29 (18.2)	45 (28.3)	62 (39.0)	159 (100)

Most of the respondents in this study were from the Malay ethnic group (46.5%), followed by the Chinese ethnic group (42.1%). There were only four Indian trainee teachers and 14 trainee teachers from other ethnicity in the study. Because of the small number of the Indian ethnic group which was four, the researcher had grouped them with the trainee teachers from the Iban, Kadazan, Dusun, Bidayuh, and Bajau ethnic as *others*.

4.1.3 Profile of Respondents in Terms of Socioeconomic Status

Table 4.3 presents the descriptive data for the socioeconomic status of the trainee teachers. The data show that the trainee teachers were mostly from the low socioeconomic status background. There were 45 trainee teachers (28.2%) who come from high socioeconomic status family and 114 trainee teachers (71.7%) from the low socioeconomic status family.

Table 4.3

Distribution of the Respondents According to Socioeconomic Status

Variables	Academic Years				
	Year 1 *n* %	Year 2 *n* %	Year 3 *n* %	Year 4 *n* %	Total *n* %
Socioeconomic Status					
Low	17 (10.7)	18 (11.3)	29 (18.2)	50 (31.5)	114 (71.7)
High	6 (3.8)	11 (6.9)	16 (10.1)	12 (7.5)	45 (28.3)
Total	23 (14.5)	29 (18.2)	45 (28.3)	62 (39.0)	159 (100)

Note. SES = Socioeconomic Status

A detailed analysis found that in year one, there were 17 trainee teachers from the low socioeconomic status and six from the high socioeconomic status. In year two, there were 18 trainee teachers from the low socioeconomic status and 11 from the high socioeconomic status. In year three, there were 29 trainee teachers from the low socioeconomic status and 16 from the high socioeconomic status.

The results revealed that the trainee teachers in year four were mostly from the low socioeconomic status (n = 50). There were only 12 trainee teachers in year four who had a high socioeconomic status background.

In summary, the analysis of the demographic of the trainee teachers indicate that (1) there were more female trainee (67.9%) in this study compared to the male trainee teachers (32.1%), (2) the majority of the respondents (88.7%) were made up of the Chinese trainee teachers and the Malay trainee teachers and (3) the majority of the trainee teachers (71.7%) were from the low socioeconomic status.

4.2 Data Analysis for Research Question One

What are the levels of musical exposures of the trainee teachers in the aspects of keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability?

Research question one examined the musical exposures in four aspects namely keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability. Keyboard grades were nominal data and musical activity involvement, aural discrimination, and self-esteem of musical ability were in ratio scale. To examine the musical exposures of the trainee teachers, descriptive statistic using frequency counts, percentages, means, and standard deviations were employed.

4.2.1 Keyboard Grades of the Respondents

Table 4.4 shows the distribution of keyboard grades of the trainee teachers. The data showed that 63.5% (n = 101) of the trainee teachers did not have any keyboard grades and 36.5% (n = 58) of the trainee teachers had learnt keyboard or piano to a certain level.

Table 4.4

Distribution of the Respondents According to Keyboard Grades

Keyboard Grades	Total	
	n	%
No grades	101	63.5
Grade 1 - 3	6	3.8
Grade 4 - 5	16	10.1
Grade 6 - 7	19	11.9
Grade 8 and above	17	10.7
Total	159	100.00

Comparing the number of trainee teachers that had keyboard grades, it was found that there were more trainee teachers who accomplished grade 6 to 7 (n = 19). The least number of trainee teachers was the trainee teachers in the category of grade 1 to 3 (n = 6).

4.2.2 Musical Activity Involvement of the Respondents

The data of the trainee teachers' involvement in musical activities was collected from a researcher built questionnaire. A list of common activities was itemised in the questionnaire. However, the trainee teachers were allowed to name the activities if it was not in the list. One point was given for the presence of any of the activities listed by the trainee teachers. The level of musical activity involvement was obtained by adding up the numbers of activities participated.

The common musical activities participated by the trainee teachers in this study were the choir, recorder ensemble, orchestra, *gamelan*, band, wind band, *caklempong*, and private lessons. Other than the above musical activities, some of the trainee teachers participated in dance, drum line, *ghazal*, *keroncong*, theatre, shadow puppet (*wayang kulit*) and *nasyid*. However, the number of trainee teachers who participated in the above activities was very minimal. Table 4.5 illustrates the number of activities and percentage of cases of the trainee teachers who participated in the common musical activities.

The data show that there were two popular musical activities participated by the trainee teachers. The two musical activities were the choir (95.0%) and the *gamelan* playing (64.2%). The least participated musical activity was *caklempong* (14.5%). The data also indicate that 34.0% of trainee teachers took private lessons such as piano, organ, voice, or guitar lessons. Results indicate that the majority of the trainee teachers had exposed to singing in groups (choir). They were also exposed to group ensemble that requires rhythm coordination (*gamelan*). In addition, a small percentage of trainee teachers were exposed to individual private lessons.

Table 4.5

Distribution of the Respondents According to Musical activity involvement

Common Musical Activities	Total	
	n	%
Choir	151	95.0
Recorder Ensemble	63	39.6
Orchestra	49	30.8
Gamelan	102	64.2
Band	65	40.9
Wind band	28	17.6
Caklempong	23	14.5
Private Lessons	54	34.0

Note. A respondent may involves in one or more musical activities.

4.2.3 Aural Discrimination of the Respondents

The aural discrimination of the trainee teachers was obtained from the score in the aural discrimination Test. The mean score and standard deviation of aural discrimination and the components in the aural discrimination is presented in Table 4.6.

The mean of the total score of aural discrimination of the trainee teachers was 101.26, and the standard deviation was 14.82. In percentage, the average mark was 77.9%. The data suggest that the trainee teachers of this study had moderate high aural discrimination.

A detailed analysis of the components in aural discrimination is presented in Table 4.19. Data show that pitch discrimination had a mean score of 52.09, and the standard deviation was 6.42. Interval discrimination had a mean score of 17.84 and the standard deviation was 6.12. The mean score of meter discrimination was 8.61, and the standard deviation was 1.61. Cadence recognition had a mean score of 6.57, and the standard deviation was 2.12. The mean score of auditory-visual discrimination was 7.18, and the standard deviation was 2.08. The mean score of mode discrimination was 8.96, and the standard deviation was 1.31.

The mean score of aural discrimination indicates that the trainee teachers had high mode discrimination, pitch discrimination, and meter discrimination skills. They had moderate auditory-visual discrimination and cadence recognition. However, the trainee teachers were weak in interval discrimination.

Table 4.6

Mean, Standard Deviation, and Percentage of the Aural Discrimination Test

Aural Discrimination	Mean	*SD*	% of Mean
Pitches Discrimination	52.09	6.42	86.8
Interval Discrimination	17.84	6.12	59.5
Meter Discrimination	8.61	1.61	86.1
Cadence Recognition	6.57	2.12	65.7
Visual Discrimination	7.18	2.08	71.8
Mode Discrimination	8.96	1.31	89.6
Total score	101.26	14.82	77.9

Note. Aural discrimination as measured by the Aural discrimination Test had a maximum total score = 130. Pitch discrimination = 60, interval discrimination = 30, meter discrimination = 10, cadence recognition = 10, visual discrimination = 10, mode recognition =10.

The data imply that the trainee teachers had good tonality (mode discrimination), good pitch perceptions (pitch discrimination), and rhythm sense (meter discrimination). However, they were weak in the ability to differentiate the distance of two pitches (interval discrimination) and the ability to sense the resolution of a harmonic progression (cadence recognition).

4.2.4 Self-esteem of Musical Ability of the Respondents

The trainee teachers' musical self-esteem of musical ability was measured using the Self-Esteem of Musical Ability questionnaire developed by Colwell (1970). There were 43 items in the questionnaire in a Likert-type scale of 4 choices that were strongly disagree (1), disagree (2), agree (3), and strongly agree (4). The level of self-esteem of musical ability was divided into three categories namely high self-esteem of musical ability (172 to 139), moderate self-esteem of musical ability (138 to 121), and low self-esteem of musical ability (120 to 43) as suggested by Austin (1990).

The data in Table 4.7 indicate that there were relatively more trainee teachers with low self-esteem in musical ability (n = 73) in this study compared to the numbers of trainee teachers in moderate level (n = 64) and high level (n = 22). In other words, that majority of the trainee teachers (86.2%) had low and moderate self-esteem in musical ability. The mean score of the overall

Table 4.7

Distribution of the Respondents According to Self-esteem of Musical Ability

Self-esteem of Musical Ability	Total	
	n	%
Low Self-esteem	73	45.9
Moderate Self-esteem	64	40.3
High Self-esteem	22	13.8
Total	159	100.00

Note. Total score = 172. Self-perception has 17 items; Support and recognition has 18 items; Personal interest and desire have 8 items.
Low self-esteem = 43-120
Moderate self-esteem = 121-138
High self-esteem = 139-172

4.2.5 Summary of Results for Research Question One

1. The keyboard grades revealed that 63.5% of the trainee teachers did not have any keyboard grades. However, there were 10.7% of the trainee teachers who had grade 8 and above.

2. The musical activity involvement score showed that the majority of the trainee teachers had participated in choir and Gamelan (95.0% and 64.2% respectively).

3. The aural discrimination of the trainee teachers was moderately high (77.9%). They exhibited high abilities in tonality, pitch perceptions, and rhythm sense. However they did not exhibit high abilities in differentiation of distance of pitches and recognition of harmonic progressions.

4. The majority of the trainee teachers (86.2%) had low and moderate self-esteem of musical ability.

4.3 Data Analysis for Research Question Two

Are there any significant relationships between keyboard grades and personal variables among the trainee teachers?

Research question two examined the relationship between keyboard grades and personal variables namely gender, ethnicity, academic years, and socioeconomic status of the trainee teachers.

To answer research question two, descriptive statistic and inferential statistic were used. Considering that the keyboard grades and personal variables were nominal data, non-parametric test was employed to examine the relationships. First, the frequency and percentage were used to describe keyboard grades according to personal variables. Following that, the inferential statistics that were the Mann-Whitney U Test and the Kruskal-Wallis Test were used to determine whether significant differences exist between keyboard grades and personal variables of the trainee teachers. The level of significance was set at $p < .05$ for all statistical tests.

4.3.1 Keyboard Grades and Gender

Table 4.8 shows the distribution of keyboard grades according to gender. The data show that there were 44 male trainee teachers and 57 female trainee teachers with no keyboard grades. This means that there were relatively more female trainee teachers (35.8%) than male trainee teachers (27.7%) who have no keyboard grades.

The data also indicate that there were more female trainee teachers who have high keyboard grades compared to the male trainee teachers (Grade 6 to 7: Male = 0.62%, Female = 11.32%; Grade 8 and above: Male = 1.26%, Female = 9.43%). It can be concluded that the majority of the trainee teachers (63.5%) had no keyboard grades.

Table 4.8

Distribution of the Respondents According to Keyboard Grades by Gender

Variables	Gender					
	Male		Female		Total	
	n	%	*n*	%	*n*	%
Keyboard grades						
No grades	44	27.7	57	35.8	101	63.5
Grade 1 - 3	2	1.3	4	2.5	6	3.8
Grade 4 - 5	2	1.3	14	8.8	16	10.1
Grade 6 - 7	1	0.6	18	11.3	19	11.9
Grade 8 and above	2	1.3	15	9.4	17	10.7
Total	51	32.2	108	67.8	159	100.00

The inferential statistic of keyboard grades and gender is shown in Table 4.9. The results indicate that the male and female trainee teachers were significantly different in their keyboard grades, U = 1793.00, z = -4.12, p < .05. Thus, it can be concluded that the male and female trainee teachers demonstrated significant differences in the keyboard grades. The female trainee teachers outperformed the male trainee teachers (Mean rank: Male = 61.16; Female = 88.90).

Table 4.9

Mann-Whitney U Test for the Differences in Keyboard Grades among Gender

Gender	Mean Rank	*U*	*z*	*p*
Male	61.16	1793.00	-4.12	.00***
Female	88.90			

Note. ***significant at $p < .001$

4.3.2 Keyboard Grades and Ethnicity

Analysis of keyboard grades based on ethnicity is shown in Table 4.10. The data indicate that the number of trainee teachers with no keyboard grade according to ethnicity was: 69 Malay trainee teachers, 21 Chinese trainee teachers, and 11 trainee teachers from the other ethnic groups. The results indicate that the highest number of trainee teachers without keyboard grades were the Malay trainee teachers (n = 69).

The data also indicate that the number of trainee teachers with grade 6 to 7 according to ethnicity was: 2 Malay trainee teacher, 14 Chinese trainee teachers, and 3 trainee teacher from the other ethnic. Besides that, the data also indicate that the number of trainee teachers with grade 8 and above according to ethnicity was: 1 Malay trainee teacher, 16 Chinese trainee teachers, and none trainee teacher from the other ethnic.

Table 4.10

Distribution of the Respondents According to Keyboard Grades by Ethnicity

Variables	Ethnicity			
	Malay	Chinese	Others	Total
	n %	*n* %	*n* %	*n* %
Keyboard Grade				
No grades	69 (43.4)	21 (13.2)	11 (6.9)	101 (63.5)
Grade 1 - 3	0 (0)	4 (2.5)	2 (1.3)	6 (3.8)
Grade 4 - 5	2 (1.3)	12 (7.5)	2 (1.3)	16 (10.1)
Grade 6 - 7	2 (1.3)	14 (8.8)	3 (1.9)	19 (11.9)
Grade 8 and above	1 (.6)	16 (10.1)	0 (0)	17 (10.7)
Total	74 (46.5)	67 (42.1)	18 (11.4)	159 (100.0)

The results indicate that the Chinese trainee teachers outnumbered the Malay trainee teachers and the trainee teachers from the other ethnic groups in terms of keyboard grades.

The inferential statistic using Kruskal-Wallis test to determine significant differences between keyboard grades and ethnicity is shown in Table 4.11. The data indicate that there were significant differences in keyboard grades among the different ethnicity x^2 (df = 2) = 57.14, $p < .05$. Thus, it can be concluded that the Malay, Chinese, and the trainee teachers from other ethnic groups had a different skill level with regard to their keyboard grades. The Chinese trainee teachers outperformed the trainee teachers from the other ethnic groups (Mean rank: Chinese = 106.76; Malay = 56.31; Others = 77.78).

Table 4.11

Kruskal-Wallis Test for the Differences in Keyboard Grades among Ethnicity

Ethnicity	*n*	Mean Rank	*df*	x^2	*p*
Malay	74	56.31	2	57.14	.00***
Chinese	67	106.76			
Other	18	77.78			
Total	159				

Note. ***significant at $p < .001$

4.3.3 Keyboard Grades and Academic Years

Analysis of keyboard grades based on academic years is shown in Table 4.12. The data reported that there were 48 trainee teachers in year four, 22 trainee teachers in year three, 23 trainee teachers in year two, and 8 trainee teachers in year one that had no keyboard grades. The results indicate that the highest number of trainee teachers without keyboard grades were from year four (n = 48).

The results also indicate that year three had the highest number (n = 8) of trainee teachers who had grade 8 and above in their piano or keyboard grades. Year two had no (n = 0) trainee teacher who had grade 8 and above in their keyboard grade.

Table 4.12

Distribution of the Respondents According to Keyboard Grades by Academic Years

Variables	Academic Years Year 1 n %	Year 2 n %	Year 3 n %	Year 4 n %	Total n %
Keyboard Grade					
No grades	8 (5.0)	23 (14.5)	22 (13.8)	48 (30.2)	101 (63.5)
Grade 1 - 3	1 (.6)	0 (0.0)	4 (2.6)	1 (.6)	6 (3.8)
Grade 4 - 5	6 (3.8)	3 (1.9)	4 (2.5)	3 (1.9)	16 (10.1)
Grade 6 - 7	4 (2.5)	3 (1.9)	7 (4.4)	5 (3.1)	19 (11.9)
Grade 8 and above	4 (2.5)	0 (0.0)	8 (5.0)	5 (3.2)	17 (10.7)
Total	23 (14.4)	29 (18.3)	45 (28.3)	62 (39.0)	159 (100.0)

The data in Table 4.13 show that there were significant differences in keyboard grades among the different academic years x^2 (df = 2) = 18.89, $p < .05$.

Thus, it can be concluded that the trainee teachers in year one, year two, year three, and year four did not perform equally well with regards to their keyboard grades. The trainee teachers in year one outperformed the trainee teachers from other academic years in keyboard grade (Mean rank: Year one = 101.80; Year two = 66.16; Year three = 92.02; Year four = 69.66).

Table 4.13

Kruskal-Wallis Test for the Differences in Keyboard Grades among Academic Years

Academic Years	*n*	Mean Rank	*df*	x^2	*p*
Year 1	23	101.80	3	18.89	.00***
Year 2	29	66.16			
Year 3	45	92.02			
Year 4	62	69.66			
Total	159				

Note. ***significant at $p < .001$

4.3.4 Keyboard Grades and Socioeconomic Status

Table 4.14 shows the distribution of keyboard grades according to socioeconomic status. The data indicate that the number of trainee teachers with no keyboard grades in the high socioeconomic status category and low socioeconomic status was 28 and 73 respectively.

Table 4.14

Distribution of the Respondents According to Keyboard Grades by Socioeconomic Status

Variables	Socioeconomic Status					
	High SES		Low SES		Total	
	n	%	*n*	%	*n*	%
Keyboard grades						
No grades	28	17.6	73	45.9	101	63.52
Grade 1 - 3	1	0.6	5	3.1	6	3.77
Grade 4 - 5	6	3.8	10	6.3	16	10.06
Grade 6 - 7	6	3.8	13	8.2	19	11.95
Grade 8 and above	4	2.5	13	8.2	17	10.69
Total	45	28.3	114	71.7	159	100.00

The results indicate that there were more trainee teachers from the low socioeconomic status (45.9%) than high socioeconomic status (17.6%) who had no keyboard grades. It can be concluded that about half of the trainee teachers in this study were from the low socioeconomic status and had no keyboard grades.

The inferential statistic of keyboard grades and socioeconomic status using Mann-Whitney T test is shown in Table 4.15. The results indicate that there was no significant difference in the keyboard grades between the trainee teachers in low socioeconomic status and high socioeconomic status, $U = 2537.50$, $z = -.12$, $p > .05$. Thus, it can be concluded that the socioeconomic status of the trainee teachers had no influence on their keyboard grades.

Table 4.15

Mann-Whitney U Test for the Differences in Keyboard Grades among Socioeconomic Status

Gender	Mean Rank	*U*	*z*	*p*
Low SES	79.76	2537.50	-.12	.90
High SES	80.61			

4.3.5 Summary of Results for Research Question Two

1. It was found that there were significant differences in keyboard grades among gender, ethnicity, and academic grades. This means that the trainee teachers did not perform equally well in keyboard grades in terms of gender, ethnicity, and academic years. Female trainee teachers were more exposed to keyboard skills than male trainee teachers. Similarly, Chinese trainee teachers were more exposed to keyboard skills than other ethnicity. The year one trainee teachers were exposed more to keyboard skills than the other trainee teachers.

2. It was found that there was no significant difference in keyboard skills among the high and low socioeconomic status. This means that the trainee teachers from high and low socioeconomic status performed equally well in keyboard grades.

4.4 Data Analysis for Research Question Three

Are there any significant relationships between involvement in musical activities and personal variables among the trainee teachers?

Research question three examined the relationships between involvement in musical activities and personal variables of gender, ethnicity, academic years, and socioeconomic status of the trainee teachers.

To answer research question three, descriptive statistic and inferential statistic were used. First, the mean and standard deviation were used to describe the involvement in musical activities according to personal variables. Following that, the inferential statistics that were the *t*-test, one-way ANOVA and Tukey HSD were used to determine whether significant differences exist between musical activity involvement and personal variables of the trainee teachers. The level of significance was set at $p < .05$ for all statistical tests.

4.4.1 Musical Activity Involvement and Gender

Table 4.16 presents the mean score of musical activity involvement and gender. The results reported that the male trainee teachers scored higher ($M = 4.00$, $SD = 2.07$) than the female trainee teachers ($M = 3.63$, $SD = 1.39$) in the musical activity involvement. The mean scores reveal that the male trainee teachers were exposed to more musical activities than the female trainee teachers.

The *t*-test was carried out to compare the musical activity involvement between the male and female trainee teachers. Before the *t*-test was conducted, the Levene's test of homogeneity of variances was carried out. Results show that the variances were not significant ($p > .05$) for the two groups (male and female) on the musical activity involvement scale. Hence the equal-variance *t*-test can be used.

Table 4.16

Mean and Standard Deviation of Musical activity involvement by Gender

Variables	Gender					
	Male (n = 51)		Female (n = 108)		Total Score (n = 159)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Musical Activity Involvement						
Total score	4.00	2.07	3.63	1.39	3.75	1.64

The data in Table 4.17 show no significant difference in the mean score of musical activity involvement between the male and female trainee teachers $t(157) = 1.33$, $p > .05$, and the effect size was small, $d = .21$. This means that there is no difference in the involvements in musical activities between male and female trainee teachers.

Table 4.17

Result of Independent Sample t-test for Differences between Gender and Musical activity involvement

Musical Activity Involvement	*M*	*SD*	*df*	*t*	*p*	*d*
Male	4.00	2.07	157	1.33	.19	.21
Female	3.63	1.39				

4.4.2 Musical Activity Involvement and Ethnicity

Analysis of musical activity involvement based on ethnicity is shown in Table 4.18. The data indicate that the mean of musical activity involvement for the Malay trainee teachers was 3.87 and the standard deviation was 1.98. The mean of musical activity involvement for the Chinese trainee teachers was 3.70 and the standard deviation was 1.23. The mean for the other ethnic group was 3.33 and the standard deviation was 1.46. The data indicate that the Malay trainee teachers had a higher mean score in musical activity involvement compared to the other two ethnic groups.

Table 4.18

Distribution of the Respondents According to Musical Activity Involvement by Ethnicity

Variables	Ethnicity							
	Malay		Chinese		Others		Total	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Musical Activity Involvement								
Total	3.87	1.98	3.70	1.23	3.33	1.46	3.75	1.64

The one-way ANOVA test on musical activity involvement and ethnicity is shown in Table 4.19. The results did not show significant differences in musical activity involvement among the different ethnicity $F(2, 156) = .88$, $p > .05$. Thus, it can be concluded that the Malay, Chinese, and the trainee teachers from other ethnic group did not have different musical exposure with regard to their musical activity involvement.

Table 4.19

Summary of One-way ANOVA for Differences between Ethnicity and Musical Activity Involvement

Source	Musical Activity Involvement	Sum of Squares	*df*	Mean Square	*F*	*p*
Musical Activity Involvement	Between Groups	4.77	2	2.39	.88	.42
	Within Groups	421.17	156	2.70		
	Total	425.94	158			

Results of Tukey HSD test:

Musical Activity Involvement	*(I) Ethnic*	*(J) Ethnic*	*Mean Difference (I-J)*	*Std. Error*	*p*
Total Score	Malay	Chinese	.19	.28	.77
		Others	.56	.43	.40
	Chinese	Malay	-.19	.28	.77
		Others	.37	.44	.68
	Others	Malay	-.56	.43	.40
		Chinese	-.37	.44	.68

4.4.3 Musical Activity Involvement and Academic Years

Table 4.20 presents the means and standard deviations of the musical activity involvement according to academic years. The data recorded that the mean scores of the musical activity involvement for year one was 3.30 and the standard deviation was 1.36. The mean scores of the musical activity involvement for year two was 2.62 and the standard deviation was 1.29. In addition the mean scores of the musical activity involvement for year three was 4.38 and the standard deviation was 1.84. The mean scores of the musical activity involvement for year four was 3.98 and the standard deviation was 1.44.

Table 4.20

Mean and Standard Deviation According to Musical Activity Involvement by Academic Years

Variables	Academic Years							
	Year 1		Year 2		Year 3		Year 4	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Musical Activity Involvement Total score	3.30	1.36	2.62	1.29	**4.38**	1.84	3.98	1.44

The results indicate that the year three trainee teachers participated in more musical activities compared to the trainee teachers from the other academic years. The results also indicate that year two trainee teachers had the least exposure to musical activities.

The one-way ANOVA test was used to analyse the significant difference of musical activity involvement and academic years. The results are shown in Table 4.21. The data indicate that there was a significant difference in musical activity involvement among the different academic years $F(3, 155) = 8.92$, $p < .01$. Thus, it can be concluded that the trainee teachers in year one, year two, year three, and year four had different level of involvement with regards to musical activities.

Data in Table 4.21 also show significant differences in musical activity involvement between year three and year one (Mean: year three = 4.38, year one = 3.30, $p < .01$), year three and year two (Mean: year three = 4.38, year two = 2.62, $p < .01$), and between year four and year two (Mean: year four = 4.29, year two = 2.62, $p < .01$). The results imply that year four and year three trainee teachers were more exposed to musical activities compared to year two trainee teachers.

Table 4.21

Summary of One-way ANOVA for Differences between Academic Years and Musical Activity Involvement

Source	Academic Years	Sum of Squares	*df*	Mean Square	*F*	*p*
Musical Activity Involvement	Between Groups	62.68	3	20.89	8.92	.00***
	Within Groups	363.26	155	2.34		
	Total	425.94	158			

Results of Tukey HSD test:

Musical Activity Involvement	*(I) Year*	*(J) Year*	*Mean Difference (I-J)*	*Std. Error*	*p*
Total Score	Year 1	Year 2	.68	.43	.38
		Year 3	-1.07*	.39	.04*
		Year 4	-.68	.37	.27
	Year 2	Year 1	-.68	.43	.38
		Year 3	-1.76*	.37	.00***
		Year 4	-1.36*	.34	.00**
	Year 3	Year 1	1.07*	.39	.04*
		Year 2	1.76*	.37	.00***
		Year 4	.39	.30	.56
	Year 4	Year 1	.68	.37	.127
		Year 2	1.36*	.34	.00**
		Year 3	-.39	.30	.56

Note. *significant at $p < .05$, **significant at $p < .01$, ***significant at $p < .001$

4.4.4 Musical Activity Involvement and Socioeconomic Status

Table 4.22 shows the distribution of musical activity involvement according to socioeconomic status. The data reported that the mean score for high socioeconomic status trainee teachers was 4.07, and the standard deviation was 1.89. The mean for the low socioeconomic status trainee teachers was 3.62 and the standard deviation was 1.52.

The results indicate that the high socioeconomic status trainee teachers had a higher exposure to musical activities compared to the low socioeconomic status trainee teachers.

Table 4.22

Distribution of the Respondents According to Musical Activity Involvement by Socioeconomic Status

Variables	Socioeconomic Status					
	High SES (n = 45)		Low SES (n = 114)		Total (n = 159)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Musical Activity Involvement						
Total	4.07	1.89	3.62	1.52	3.75	1.64

The *t*-test of musical activity involvement and socioeconomic status is shown in Table 4.23. The results show that there was no significant difference in the level of involvement in musical activities between the trainee teachers in low socioeconomic status and high socioeconomic status (t = -1.54, p > .05), and the effect size was small, d = .20. Thus, it can be concluded that the socioeconomic status of the trainee teachers had no influence on their musical activity involvement.

Table 4.23

Results of Independent Sample t-test for Differences between Socioeconomic Statuses and Musical Activity Involvement

Musical Activity Involvement	*M*	*SD*	*df*	*t*	*p*	*d*
Low SES	3.75	2.07	157	-1.54	.13	.20
High SES	4.18	2.24				

4.4.5 Summary of Results in Research Question Three

1. It was found that there were no significant differences in musical activity involvement among gender, ethnicity, and socioeconomic status of the trainee teachers. This means that the trainee teachers' involvement in musical activities has no differences in terms of gender, ethnicity, and socioeconomic status.
2. It was found that there was a significant difference in musical activity involvement among year one, year two, year three, and year four trainee teachers. This means that the trainee teachers in year one, year two, year three, and year four were not equally exposed to musical activities in terms of musical activity involvement. Year four and year three trainee teachers were more exposed to musical activities compared to year two and year one trainee teachers.

4.5 Data Analysis for Research Question Four

Are there any significant relationships between aural discrimination and personal variables among the trainee teachers?

Research question four examined the relationships between aural discrimination and personal variables namely gender, ethnicity, academic grades, and socioeconomic status.

Descriptive statistic and inferential statistic were used to answer research question four. The aural discrimination score was a ratio data and had a normal curve. Hence parametric test was employed. The data analysis for research question four is presented as follows:

First, the means and standard deviations of aural discrimination according to gender, ethnicity, socioeconomic status, and academic years were analysed. This was followed by the analysis of the relationships between aural discrimination and personal variables using independent sample t-test and one-way ANOVA to determine whether significant differences exist. Tukey HSD was also employed to determine which group of the variables had a significant difference in the analysis. The level of significance was set at $p < .05$ for all statistical tests.

4.5.1 Aural Discrimination and Gender

Table 4.24 shows the mean score of aural discrimination and gender. The data indicate that the mean of the aural discrimination of the male trainee teachers was 99.47, and the standard deviation was 14.40. The mean of the female trainee teachers was 102.10, and the standard deviation was 14.99. The results indicate that the female trainee teachers had a higher mean score than the male trainee teachers.

Table 4.24

Mean and Standard Deviation of Aural Discrimination by Gender

Variables	Gender					
	Male (n = 51)		Female (n = 108)		Total Score (n = 159)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Aural Discrimination						
Total score	99.47	14.40	102.10	14.99	101.26	14.81

The independent sample *t*-test was conducted to analyse the differences between the mean scores of aural discrimination and gender. Table 4.25 shows the summary of results.

Table 4.25

Result of Independent Sample t-test for Differences between Gender and Aural Discrimination

Aural Discrimination	*M*	*SD*	*df*	*t*	*p*
Male	99.47	14.40	157	-1.046	.30
Female	102.10	14.99			

In order to assume that the variances are homogenous (Kinnear & Gray, 2009) the Levene's test of homogeneity of variances was carried out. Results show that the variances were not significant (p > .05) for the two groups (male and female) on the aural discrimination scale. Hence the equal-variance *t*-test can be used.

From the *t*-test results it was found that the mean of the male trainee teachers (M = 99.47, SD = 14.40) was not significantly different from the female trainee teachers (M = 102.10, SD = 14.99), t(157) = 1.046; p > .01. The results suggest that though female trainee teachers were slightly musically better than male trainee teachers in the mean score, the difference was not significant. It means that there is no significant difference between male and female on aural discrimination among the trainee teachers in this study.

The means and standard deviations of the components of aural discrimination are presented in Table 4.26. The data indicate that the male trainee teachers (*M* = 6.61, *SD* = 2.31) only out-performed the female trainee teachers (*M* = 6.56, *SD* = 2.03) in the component of cadence recognition.

Table 4.26

Means of Components for Aural Discrimination by Gender

Variables	Gender					
	Male (n = 51)		Female (n = 108)		Total Score (n = 159)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Aural Discrimination						
Pitches Discrimination	51.63	6.46	52.31	6.42	52.09	6.42
Interval Discrimination	16.73	5.83	18.73	6.21	17.84	6.12
Meter Discrimination	8.59	1.68	8.62	1.59	8.61	1.61
Cadence Recognition	6.61	2.31	6.56	2.03	6.57	2.12
Visual Discrimination	7.16	1.92	7.19	2.16	7.18	2.08
Mode Recognition	8.76	1.54	9.06	1.18	8.96	1.32

Note. Aural discrimination as measured by the Aural discrimination Test had a maximum total score = 130. Pitch discrimination = 60, interval discrimination = 30, meter discrimination = 10, cadence recognition = 10, visual discrimination = 10, mode recognition =10.

The other components such as pitch discrimination (*M* = 52.31, *SD* = 6.42), interval discrimination (*M* = 18.73, *SD* = 6.21), meter discrimination (*M* = 8.62, *SD* = 1.59), visual discrimination (*M* = 7.19, *SD* = 2.16) and mode recognition (*M* = 9.0.6, *SD* = 1.18) were scored higher by the female trainee teachers. Thus, the female trainee teachers outperformed the male trainee teachers in five of the six components of aural discrimination.

The independent sample *t*-test was employed to analyse the differences between the score of the components of aural discrimination and gender.

Table 4.27

Results of Independent Sample t-test for Differences between Gender and Components of Aural Discrimination

Aural Discrimination	Gender	*M*	*SD*	*df*	*t*	*p*
Pitch Discrimination	Male	51.63	6.46	157	-.62	.54
	Female	52.31	6.42			
Interval Discrimination	Male	16.73	5.83	157	-1.59	.11
	Female	18.37	6.21			
Meter Discrimination	Male	8.59	1.68	157	-.12	.91
	Female	8.62	1.59			
Cadence Recognition	Male	6.61	2.31	157	.15	.89
	Female	6.56	2.03			
Auditory-visual Discrimination	Male	7.16	1.92	157	-.11	.92
	Female	7.19	2.16			
Mode Discrimination	Male	8.76	1.54	157	-1.31	.19
	Female	9.06	1.18			

Table 4.27 presents the *t*-test for the components of aural discrimination. Results showed that the mean score of all six components of aural discrimination were not significantly different in terms of gender. It means that there was no difference in mean scores between male and female on pitch discrimination, interval discrimination, meter discrimination, cadence recognition, auditory-visual discrimination, and mode discrimination.

Thus, the results suggest that the gender of the trainee teachers had no influence on their aural discrimination.

4.5.2 Aural Discrimination and Ethnicity

In this study, the trainee teachers were divided into three categories of ethnicity namely Malay, Chinese, and others. There were 74 Malays, 67 Chinese, and 19 trainee teachers from the other ethnic groups.

Table 4.28 presents the mean and standard deviation of the aural discrimination test results. Data show that the mean score of aural discrimination for the Malay trainee teachers was 99.47 (*SD* = 14.40). The mean score for the total aural discrimination score for the Chinese trainee teachers was 102.10, (*SD* = 14.99). The mean score for the total aural discrimination score for the other ethnic groups was 101.26, (*SD* = 14.81). The data reveal that for the total score of aural discrimination, the Chinese trainee teachers outperformed the other ethnic groups and the Malay trainee teachers. The Malay trainee teachers had the lowest score of aural discrimination.

Table 4.28

Means for Aural Discrimination by Ethnicity

Variables	Ethnicity					
	Malay (n = 74)		Chinese (n = 67)		Other (n = 18)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Aural Discrimination						
Total score	97.05	14.41	107.02	13.18	97.11	14.81

Table 4.29 presents the one-way ANOVA analyses to determine whether ethnicity impacted aural discrimination. The analysis from the one-way ANOVA test found that there was a significant difference between total scores of aural discrimination with ethnicity $F(2, 156) = 9.71$, $p < .01$.

Data indicate that there were significant differences in aural discrimination score between the Chinese and Malay trainee teachers (Mean: Chinese = 107.02, Malay = 97.05, $p < .01$), and the effect size was $d = .72$. Data also reported that the Chinese and trainee teachers had a higher mean score than the trainee teachers from the other ethnic groups (Mean: Chinese = 107.02, Other = 97.11, $p < .01$), and the effect size was moderate, $d = .71$. This means that the Chinese trainee teachers outperformed the Malay trainee teachers and the trainee teachers from other ethnic groups in aural discrimination.

Table 4.29

Summary of One-way ANOVA for Differences between Ethnicity and Aural Discrimination

Source	Ethnicity	*Sum of Squares*	*df*	*Mean Square*	*F*	*p*
Aural Discrimination	Between Groups	3837.88	2	1918.94	9.71	.00***
	Within Groups	30826.55	156	197.61		
	Total	34664.43	158			

Results of Tukey HSD test:

Aural Discrimination	*(I) Ethnic*	*(J) Ethnic*	*Mean Difference (I-J)*	*Std. Error*	*p*	*d*
Total Score	Malay	Chinese	-9.96*	2.37	.00***	-.72
		Others	-.06	3.69	1.00	-.00
	Chinese	Malay	9.96*	2.37	.00***	.72
		Others	9.90*	3.73	.02*	.71
	Others	Malay	.06	3.69	1.00	.00
		Chinese	-9.90*	3.73	.02*	-.71

Note. *significant at $p < .05$, ***significant at $p < .001$

Table 4.30 presents the means and standard deviations of the components of aural discrimination according to the ethnicity.

Table 4.30

Means of Components for Aural Discrimination by Ethnicity

Variables	Ethnicity					
	Malay (n = 74)		Chinese (n = 67)		Other (n = 18)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Aural Discrimination						
Pitches Discrimination	50.28	6.84	54.39	5.29	50.94	6.07
Interval Discrimination	16.05	5.76	20.09	5.76	16.83	6.50
Meter Discrimination	8.49	1.66	8.97	1.33	7.78	2.05
Cadence Recognition	6.78	2.23	6.42	1.9	6.28	2.45
Visual Discrimination	6.65	1.84	8.12	1.86	5.89	2.45
Mode Discrimination	8.80	1.58	9.03	1.04	9.39	.85

Note. The total score for MAT = 130.

Results indicate that the Chinese trainee teachers outperformed the other ethnic groups and Malay trainee teachers in pitch discrimination, interval discrimination, meter discrimination, and auditory-visual discrimination. The Malay trainee teachers outperformed the other ethnic groups and Chinese trainee teachers in cadence recognition. The other ethnic group outperformed the Malay and Chinese trainee teachers in mode discrimination.

The one-way ANOVA analysis was conducted to determine significant differences between components of aural discrimination on ethnicity. The results are presented in Table 4.31 The components of aural discrimination that had significant difference with ethnicity was pitch discrimination $F(2, 156) = 8.19$, $p < .01$, interval discrimination $F(2, 156) = 8.69$, $p < .01$, meter discrimination $F(2, 156) = 4.48$, $p < .01$, and auditory-visual discrimination, $F(2, 156) = 14.90$, $p < .01$.

Further analysis was carried out on every component of aural discrimination using the Tukey HSD test to ascertain whether there were significant differences among the ethnic groups on aural discrimination. The results of the Tukey HSD are reported in Appendix E.

In terms of pitch discrimination, data show a significant difference in pitch discrimination among the Chinese and Malay trainee teachers (Mean: Malay = 50.28, Chinese = 54.39, $p < .01$). The Chinese trainee teachers had a higher mean score than the Malay trainee teachers. This means that the Chinese trainee teachers outperformed the Malay trainee teachers in pitch discrimination.

In terms of interval discrimination, data show a significant difference in interval discrimination among the Chinese and Malay trainee teachers (Mean: Malay = 16.05, Chinese = 20.09, $p < .01$). The Chinese trainee teachers had a higher mean score than the Malay trainee teachers. This means that the Chinese trainee teachers outperformed the Malay trainee teachers in interval discrimination.

In terms of meter discrimination, there was a significant difference in the mean score between the Chinese trainee teachers and the trainee teachers from other ethnic groups (Mean: Chinese = 8.97, Others = 7.78, $p < .01$). Data indicate that the Chinese trainee teachers had a higher mean score than the trainee teachers from other ethnic groups. This means that the Chinese outperformed the trainee teachers from other ethnic groups in meter discrimination.

In terms of cadence recognition, data show no significant difference in cadence recognition among the three ethnic groups. It suggests that the three ethnic groups were not different in their cadence recognition ability.

In terms of auditory-visual discrimination, data show a significant difference in the auditory-visual discrimination score between the three ethnic groups. It was found that there were significant differences between the Chinese trainee teachers and the Malay trainee teachers (Mean: Chinese = 8.12, Malay = 6.65, $p < .01$) and between the Chinese trainee teachers and the trainee teachers from the other ethnic groups (Mean: Chinese = 8.12, Others = 5.89, $p < .01$). This means that the Chinese trainee teachers outperformed the Malay and the trainee teachers from other ethnic groups in auditory-visual discrimination.

In terms of mode discrimination, data show no significant difference in mode discrimination among the three ethnic groups. It suggests that the three ethnic groups were not different in their mode discrimination ability.

From the analysis above, it can be concluded that the Chinese trainee teachers outperformed the Malay trainee teachers in three of the six components in aural discrimination. The Chinese trainee teachers also outperformed the trainee teachers from other ethnic groups in two of the six components in aural discrimination.

Table 4.31

Summary of One-way ANOVA for Differences between Ethnicity and Components of Aural Discrimination

Components	Ethnicity	Sum of Squares	*df*	*Mean Square*	*F*	*p*
Pitches Discrimination	Between Groups	618.87	2	309.43	8.19	.00***
	Within Groups	5893.89	156	37.78		
	Total	6512.76	158			
Interval Discrimination	Between Groups	593.32	2	296.66	8.69	.00***
	Within Groups	5325.74	156	34.13		
	Total	5919.06	158			
Meter Discrimination	Between Groups	22.28	2	11.14	4.48	.01*
	Within Groups	387.53	156	2.48		
	Total	409.82	158			
Cadence Recognition	Between Groups	6.46	2	3.23	.71	.49
	Within Groups	702.45	156	4.50		
	Total	708.91	158			
Auditory-Visual Discrimination	Between Groups	110.02	2	55.01	14.90	.00***
	Within Groups	575.68	156	3.69		
	Total	685.71	158			
Mode Discrimination	Between Groups	5.59	2	2.79	1.64	.20
	Within Groups	266.17	156	1.70		
	Total	271.77	158			

Note. *significant at $p < .05$, ***signficant at $p < .001$

4.5.3 Aural Discrimination and Academic Years

Table 4.32 presents the means and standard deviations of the aural discrimination test results according to academic years. The data indicate that the mean scores of aural discrimination for trainee teachers in year one was 96.61 (*SD* = 12.84), in year two was 104.65 (*SD* = 12.76), in year three was 105.98 (*SD* = 14.90), and year four was 97.97 (*SD* = 15.26). From the mean value of aural discrimination, it was found that the trainee teacher in year three had higher mean scores than the trainee teachers from other years in aural discrimination.

Table 4.32

Means of Aural Discrimination by Academic Years

Variables	Academic Years							
	Year 1		Year 2		Year 3		Year 4	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Aural Discrimination								
Total score	96.61	12.84	104.65	12.76	**105.98**	14.90	97.97	15.26

From the data, it was found that there was a gradual increase in aural discrimination score as the trainee teachers' progress through year one to year three. However, there was a drop in the aural discrimination level when trainee teachers reached their final year.

Further analysis using the one-way ANOVA test to confirm the influence of academic years on the trainee teachers' aural discrimination is shown in Table 4.33.

The data show a significant difference between academic years and total score of aural discrimination F (3, 155) = 4.03, $p < .01$. A further analysis with Tukey HSD was used to identify which academic years had significant differences in aural discrimination.

Data reported that, for the total score of aural discrimination, there were significant differences found among trainee teachers of year three and year four (Mean: Year three = 105.98, Year four = 97.97 , $p < .01$), and the Cohen effect size was moderate, $d = .53$. It suggests that the trainee teachers in year three outperformed the trainee teachers in year four in aural discrimination.

Table 4.33

Summary of One-way ANOVA for Differences between Academic Years and Aural Discrimination

Source	Academic Years	Sum of Squares	*df*	Mean Square	*F*	*p*
Aural Discrimination	Between Groups	2505.48	3	835.16	4.03	.01**
	Within Groups	32158.94	155	207.48		
	Total	34664.43	158			

Results of Tukey HSD test:

Aural Discrimination	*(I) Year*	*(J) Year*	*Mean Difference (I-J)*	*Std. Error*	*p*	*d*
Total Score	Year 1	Year 2	-8.05	4.02	.19	-.63
		Year 3	-9.37	3.69	.06	-.67
		Year 4	-1.36	3.50	.98	-.10
	Year 2	Year 1	8.05	4.02	.19	.63
		Year 3	-1.32	3.43	.98	-.10
		Year 4	6.68	3.24	.17	.47
	Year 3	Year 1	9.37	3.69	.06	.67
		Year 2	1.32	3.43	.98	.10
		Year 4	8.01*	2.82	.03*	.53
	Year 4	Year 1	1.36	3.51	.98	.10
		Year 2	-6.68	3.24	.17	-.47
		Year 3	-8.01*	2.82	.03*	-.53

Note. *significant at $p < .05$, **signficant at $p < .01$

A detailed analysis of the mean and standard deviations on the components of aural discrimination is shown in Table 4.34. Results show that the trainee teachers in year three had higher mean scores compared to the other years in pitch discrimination, interval discrimination, and auditory-visual discrimination. The trainee teachers in year two had the highest mean score in cadence recognition and mode discrimination. Meter discrimination was score highest by the trainee teachers in year one.

One-way ANOVA was used to analyse significant differences of the components of aural discrimination among the academic years. The results are shown in Table 4.35. Data indicate that there were significant differences between academic years and components in aural discrimination. It was found that significant differences occurred in interval discrimination $F(3, 155) = 5.00$, $p < .01$, and cadence recognition $F(3, 155) = 11.73$, $p < .01$. Data suggest that academic years probably influence interval discrimination, and cadence discrimination.

Table 4.34

Means of Components for Aural Discrimination by Academic Years

Variables	Academic Years							
	Year 1		Year 2		Year 3		Year 4	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Aural Discrimination								
Pitches Discrimination	49.13	6.89	52.69	6.95	**53.47**	5.97	51.90	6.06
Interval Discrimination	16.34	5.14	19.38	4.68	**20.02**	6.78	16.09	5.97
Meter Discrimination	**8.78**	1.41	8.10	1.52	8.76	1.86	8.68	1.51
Cadence Recognition	6.78	2.04	**8.03**	1.55	6.91	2.21	5.56	1.82
Visual Discrimination	6.74	2.01	7.07	1.71	**7.87**	2.04	6.90	2.22
Mode Recognition	8.83	1.64	**9.38**	1.08	8.96	1.46	8.82	1.14
Total score	96.61	12.84	104.65	12.76	**105.98**	14.90	97.97	15.26

From the Tukey HSD test (refer to Appendix E), it was found that there was a significant difference in interval discrimination between the trainee teachers in year three and trainee teachers in year four (Mean: Year three = 20.02, Year four = 16.09, $p < .05$). The results indicate that the trainee teachers in year three outperformed the trainee teachers in year four in pitch discrimination.

Likewise, there was a significant difference in cadence recognition between the trainee teachers in year three and trainee teachers in year four (Mean: Year three = 6.91, Year four = 5.56, $p < .05$). The results indicate that the trainee teachers in year three outperformed the trainee teachers in year four in cadence recognition.

Besides that, there was also a significant difference in pitch discrimination between the trainee teachers in year three and trainee teachers in year one. Though the one-way ANOVA analyses did not show a significant difference, a detailed analysis using Tukey HSD showed that the trainee teachers in year three outperformed the trainee teachers in year one in pitch discrimination (Mean: year three = 53.47, year one = 49.13, $p < .05$).

Table 4.35

Summary of One-way ANOVA for Differences between Academic Years and Components of Aural Discrimination

Source	Academic Years	Sum of Squares	*df*	Mean Square	*F*	*p*
Pitches Discrimination	Between Groups	299.33	3	99.77	2.49	.06
	Within Groups	6213.43	155	40.08		
	Total	6512.76	158			
Interval Discrimination	Between Groups	522.62	3	174.20	5.00	.00**
	Within Groups	5396.44	155	34.81		
	Total	5919.06	158			
Meter Discrimination	Between Groups	9.36	3	3.12	1.21	.31
	Within Groups	400.46	155	2.58		
	Total	409.82	158			
Cadence Recognition	Between Groups	131.15	3	43.71	11.73	.00***
	Within Groups	577.76	155	3.72		
	Total	708.91	158			
Visual Discrimination	Between Groups	30.79	3	10.26	2.43	.07
	Within Groups	654.91	155	4.22		
	Total	685.71	158			
Mode Discrimination	Between Groups	6.68	3	2.22	1.30	.28
	Within Groups	265.09	155	1.71		
	Total	271.77	158			

Note. **significant at $p < .01$, ***signficant at $p < .001$

It can be concluded that the trainee teachers from year three outperformed other trainee teachers generally in pitch discrimination, interval discrimination, cadence recognition, and aural discrimination. However, meter discrimination, auditory-visual discrimination, and mode discrimination were independent of academic years.

4.5.4 Aural Discrimination and Socioeconomic Status

The socioeconomic statuses of trainee teachers were divided into two categories: the high socioeconomic status (n = 45) and the low socioeconomic status (n = 114). Table 4.36 presents the mean and standard deviation score of aural discrimination among the high and low socioeconomic status.

Data show that the mean score of aural discrimination of trainee teachers from the high socioeconomic status was 102.31 (SD = 15.29) and the low socioeconomic status was 100.84 (SD = 14.67). The high socioeconomic status trainee teachers had a higher aural discrimination score than the low socioeconomic status trainee teachers.

Table 4.36

Means of Aural Discrimination by Socioeconomic Status

Variables	Socioeconomic Status					
	High SES (n = 45)		Low SES (n = 114)		Total (n = 159)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Aural Discrimination Total Score	102.31	15.29	100.84	14.67	101.26	14.81

Note. The total score for Aural Discrimination Test = 130. SES = Socioeconomic Status

Table 4.37 shows the analysis of the differences between mean scores of aural discrimination and socioeconomic status using the independent sample t-test. The Levene's test of homogeneity of variance was not significant ($p > .05$) for the high and low socioeconomic status on aural discrimination. Hence, the variances were assumed to be homogenous and the equal-variances t-test was used.

Table 4.37

Results of Independent Sample t-test for Differences between Socioeconomic Statuses and Aural Discrimination

Aural Discrimination	*M*	*SD*	*df*	*t*	*p*
Low SES	100.84	14.66	157	-.56	.58
High SES	102.31	15.29			

Note. The total score of Aural Discrimination Test = 130. SES = Socioeconomic Status

The results show no significant difference between the mean of the total score of aural discrimination and socioeconomic status, $t(157) = -.56$; $p > .01$. This means that the status of the family has no influence on trainee teachers' aural discrimination.

Table 4.38 shows the analysis of the components in the aural discrimination. Results indicate that the high socioeconomic status trainee teachers had higher mean scores than the low socioeconomic status trainee teachers in interval discrimination, meter discrimination, cadence recognition, auditory-visual discrimination, and mode recognition. Low socioeconomic status trainee teachers had higher mean scores in pitch discrimination.

Table 4.38

Means of Components for Aural Discrimination by Socioeconomic Status

Variables	Socioeconomic Status					
	High SES (*n* = 45)		Low SES (*n* = 114)		Total (*n* = 159)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Aural Discrimination						
Pitches Discrimination	51.78	7.16	52.21	6.13	52.09	6.42
Interval Discrimination	18.29	6.31	17.67	6.06	17.84	6.12
Meter Discrimination	8.76	1.40	8.55	1.69	8.61	1.61
Cadence Recognition	7.07	2.07	6.38	2.11	6.57	2.12
Visual Discrimination	7.33	1.93	7.12	2.15	7.18	2.08
Mode Recognition	9.09	1.08	8.91	1.39	8.96	1.31

Note. The total score of Aural Discrimination Test = 130. SES = Socioeconomic Status

The data in Table 4.38 indicate that high socioeconomic status trainee teachers outperformed low socioeconomic status trainee teachers in five of the six components of aural discrimination.

Table 4.39 shows the analysis of the differences between mean scores of the components of aural discrimination between high and low socioeconomic statuses using the independent sample *t*-test.

Table 4.39

Results of Independent Sample t-test for Differences between Socioeconomic Statuses and Components of Aural Discrimination

Components of Aural Discrimination	Source	*M*	*SD*	*df*	*t*	*p*
Pitch Discrimination	Low SES	52.21	6.13	157	.38	.70
	High SES	51.77	7.16			
Interval Discrimination	Low SES	17.66	6.06	157	-.58	.56
	High SES	18.28	6.31			
Meter Discrimination	Low SES	8.55	1.69	157	-.72	.47
	High SES	8.76	1.40			
Cadence Recognition	Low SES	6.38	2.11	157	-1.86	.06
	High SES	7.07	2.07			
Auditory-visual Discrimination	Low SES	7.12	2.14	157	-.57	.56
	High SES	7.33	1.93			
Mode Discrimination	Low SES	8.91	1.39	157	-.76	.44
	High SES	9.09	1.08			

Note. *The mean difference is significant at the .05 level.
The total score of Aural Discrimination Test = 130. SES = Socioeconomic Status

Analysis using the Levene's test of homogeneity of variance was found to be not significant ($p > .05$) for the high and low socioeconomic status on aural discrimination. Hence, the variances were assumed to be homogenous and the equal-variances *t*-test was used.

The data in Table 4.39 show that for all the six components of aural discrimination (pitch discrimination, interval discrimination, meter discrimination, cadence recognition, auditory-visual discrimination, and mode discrimination) there were no significant differences between the high socioeconomic status trainee teachers and the low socioeconomic status trainee teachers. This means that components of aural discrimination are independent of socioeconomic status.

4.5.5 Summary of Research Question Four

The results of the analysis of aural discrimination and personal variables are summarised as follows:

1. It was found that there was no significant difference in aural discrimination among gender and socioeconomic status. This means that the trainee teachers performed equally well in aural discrimination in term of gender and socioeconomic status.
2. It was found that there were significant differences in aural discrimination among ethnicity and academic years. This means that the trainee teachers did not perform equally well in aural discrimination in terms of ethnicity and academic years. The Chinese trainee teachers were more exposed to aural discrimination skills compared to the other ethnic groups. Similarly, the year three trainee teachers were more exposed to aural discrimination skills than the other academic years.

4.6 Data Analysis for Research Question Five

Are there any significant relationships between self-esteem of musical ability and personal variables among the trainee teachers?

Research question five examined the relationships between self-esteem of musical ability and personal variables namely gender, ethnicity, academic grades, and socioeconomic status.

Descriptive statistic and inferential statistic were used to answer research question five. The self-esteem of musical ability score was in ratio scale and had a normal curve. Hence parametric test was employed. The data analysis for research question five is presented as follows.

First, the means and standard deviations of self-esteem of musical ability according to gender, ethnicity, socioeconomic status, and academic years were analysed. This is followed by the analysis of the relationships between self-esteem of musical ability and personal variables using independent sample *t*-test and one-way ANOVA to determine whether significant differences exist. Tukey HSD was also employed to determine which group of the variables had significant differences in the analysis. The level of significance was set at $p < .05$ for all statistical tests.

4.6.1 Self-esteem of Musical Ability and Gender

The data in Table 4.40 show that the male trainee teachers had higher musical self-esteem (M = 122.7, SD = 22.00) than the female trainee teachers (M = 120.6, SD = 13.42). According to the categories of self-esteem of musical ability, (high: 172 to 139, moderate: 138 to 121, low: 120 to 43), the mean values indicate that the male trainee teachers had moderate self-esteem of musical ability and the female trainee teachers had low self-esteem of musical ability.

Table 4.40

Means and Standard Deviation of Self Esteem of Musical Ability by Gender

Variables	*Self-esteem of Musical Ability*	
	M	*SD*
Gender		
Male	122.65	22.00
Female	120.56	13.42
Total	121.23	16.61

Note. Total score = 172. Self-perception has 17 items; Support and recognition has 18 items; Personal interest and desire have 8 items.

Independent sample *t*-test was employed to compare the self-esteem of musical ability between male and female trainee teachers. Before that, the Levene's test of homogeneity of variances was carried out. The Levene's test found that the variances for the two groups (male and female) were significant ($p < .05$). Hence the equal-variance not assumed *t*-test was employed.

From the *t*-test presented in Table 4.41, results reported no significant gender difference was found, $t(68.13) = .63$; $p > .01$. The male trainee teachers ($M = 122.65$, $SD = 22.00$) and the female trainee teachers ($M = 120.56$, $SD = 13.42$) had similar levels of self-esteem. It can be concluded that in this study, the self-esteem of musical ability of the trainee teachers is not influenced by their gender.

Table 4.41

Result of Independent Sample t-test for Differences between Gender and Self-Esteem of Musical Ability

Gender	*M*	*SD*	*df*	*t*	*p*
Male	122.65	22.00	68.13	.63	.53
Female	120.56	13.42			

4.6.2 Self-esteem of Musical Ability and Ethnicity

The data in Table 4.42 show the mean and standard deviation of self-esteem of musical ability among the ethnic groups. The analysis reported that the Malay trainee teachers had a higher self-esteem score (*M* = 124.68, *SD* = 19.80) compared to the Chinese trainee teachers (*M* = 118.88, *SD* = 13.49). The self-esteem in musical ability of the Malay trainee teachers and Chinese trainee teachers were higher than the trainee teachers from other ethnic groups (*M* = 115.78, *SD* = 19.85).

Table 4.42

Means and Standard Deviation of Self Esteem of Musical Ability by Ethnicity

Variables	Self Esteem of Musical Ability	
	M	*SD*
Ethnicity		
Malay	124.68	19.80
Chinese	118.88	13.49
Others	115.78	19.85

Note. Total score = 172. Self-perception has 17 items; Support and recognition have 18 items; Personal interest and desire have 8 items.

According to the categories of self-esteem of musical ability, the results show that the Malay trainee teachers had moderate self-esteem. The Chinese trainee teachers and the trainee teachers from other ethnic had low self-esteem.

One-way ANOVA was employed to determine significant differences in self-esteem of musical ability among different ethnic groups. Data presented in Table 4.43 show a significant difference in self-esteem of musical ability between the ethnic groups $F(2, 156) = 3.33$, $p < .05$. However, further analysis using Tukey HSD reported that there was no significant difference among the ethnic groups. Hence, it can be concluded that the self-esteem of musical ability of the trainee teachers is not influenced by their ethnicity.

Table 4.43

Summary of One-way ANOVA for Differences between Ethnicity and Self-Esteem of Musical Ability

Source	Ethnicity	Sum of Squares	*df*	Mean Square	*F*	*p*
Self-esteem of Musical Ability	Between Groups	1783.48	2	891.74	3.33	.04*
	Within Groups	41828.37	156	268.13		
	Total	43611.85	158			

Results of Tukey HSD test:

Self-esteem of Musical Ability	*(I) Ethnic*	*(J) Year*	*Mean Difference (I-J)*	*Std. Error*	*p*
Total Score	Malay	Chinese	5.80	2.76	.09
		Others	8.90	4.30	.10
	Chinese	Malay	-5.80	2.76	.09
		Others	3.10	4.35	.76
	Others	Malay	-8.90	4.30	.10
		Chinese	-3.10	4.35	.76

Note. *significant at $p < .05$,

4.6.3 Self-esteem of Musical Ability and Academic Years

As reported in Table 4.44, the self-esteem of musical ability mean scores of the trainee teachers in year one, year two and year three were 124.74, 122.66, and 124.20 respectively. The mean score of self-esteem of musical ability of the trainee teachers in year four was 117.10.

Table 4.44

Means and Standard Deviation of Self Esteem of Musical Ability by Academic Years

Variables	Self-esteem of Musical Ability	
	M	*SD*
Academic Years		
Year 1	124.74	8.51
Year 2	122.66	15.81
Year 3	124.20	17.80
Year 4	117.10	17.78

Note. Total score = 172. Self-perception has 17 items; Support and recognition has 18 items; Personal interest and desire have 8 items.

The results reveal that year one, year two, and year three trainee teachers had moderate self-esteem of musical ability and year four trainee teachers had low self-esteem of musical ability.

One-way ANOVA was employed to determine significant differences in self-esteem of musical ability among different academic years. Data are presented in Table 4.45. The results show no significant difference in self-esteem of musical ability between the academic years $F(3, 155) = 2.22$, $p > .05$. A further analysis using Tukey HSD also reported no significant difference between the academic years. It can be concluded that self-esteem of musical ability of the trainee teachers is independent of their academic years.

Table 4.45

Summary of One-way ANOVA for Differences between Academic Years and Aural Discrimination

Source	Academic Years	Sum of Squares	*df*	Mean Square	*F*	*p*
Aural	Between Groups	1798.24	3	599.41	2.22	.09
Discrimination	Within Groups	41813.60	155	269.76		
Score	Total	43611.84	158			

Results of Tukey HSD test:

Aural Discrimination	*(I) Year*	*(J) Year*	*Mean Difference (I-J)*	*Std. Error*	*p*
Total Score	Year 1	Year 2	2.08	4.58	.97
		Year 3	.53	4.21	.99
		Year 4	7.64	4.01	.23
	Year 2	Year 1	-2.08	4.58	.97
		Year 3	-1.54	3.91	.97
		Year 4	5.55	3.69	.43
	Year 3	Year 1	-.53	4.21	.99
		Year 2	1.54	3.91	.97
		Year 4	7.10	3.21	.12
	Year 4	Year 1	-7.64	4.01	.23
		Year 2	-5.55	3.69	.43
		Year 3	-7.10	3.21	.12

4.6.4 Self-esteem of Musical Ability and Socioeconomic Status

The data in Table 4.46 show the mean and standard deviation of the trainee teacher's socioeconomic status. It was found that the mean score for the low socioeconomic status was 119.69, and the standard deviation was 15.80. The mean score for high socioeconomic status was 125.11, and the standard deviation was 18.16. The data indicate that the low socioeconomic status trainee teachers had a lower mean score than the high socioeconomic status trainee teachers in terms of self-esteem of musical ability.

The data also indicate that in the category of high (172 to 139), moderate (138 to 121), and low (120 to 43) self-esteem of musical ability, the low socioeconomic status trainee teachers were in the low self-esteem category and the high socioeconomic status trainee teachers were in the moderate self-esteem category.

Table 4.46

Means and Standard Deviation of Self Esteem of Musical Ability by Socioeconomic Status

Variables	Self-esteem of Musical Ability	
	M	*SD*
Socioeconomic Status		
Low SES	119.69	15.80
High SES	125.11	18.16
Total	121.23	16.61

Note. Total score = 172. Self-perception has 17 items; Support and recognition has 18 items; Personal interest and desire have 8 items.

Independent sample *t*-test was carried out to compare the mean score of self-esteem according to high socioeconomic status and low socioeconomic status. Before the independent sample *t*-test analysis, the Levene's test of homogeneity of variances was carried out. The Levene's test found that the variances for the two groups were no significant ($p > .05$). Hence the equal-variance assumed *t*-test was employed.

From the *t*-test presented in Table 4.47, it is clear that no significant difference was found. The low socioeconomic status (M = 119.69, SD = 15.80) and the high socioeconomic status (M = 125.11, SD = 18.16) were equal in terms of self-esteem of musical ability. The difference was not significant, $t(157) = -1.87$; $p > .01$.

Table 4.47

Result of Independent Sample t-test for Differences between Socioeconomic Status and Self-Esteem of Musical Ability

Socioeconomic Status	*M*	*SD*	*df*	*t*	*p*
Low SES	119.69	15.80	157	-1.87	.06
High SES	125.11	18.16			

4.6.5 Summary of Results for Research Question Five

It was found that there was no significant difference in self-esteem of musical ability among gender, ethnicity, academic years, and socioeconomic status. This means that the trainee teachers had equal self-esteem of musical ability in term of gender, ethnicity, academic years, and socioeconomic status.

4.7 Data Analysis for Research Question Six

What is the level of the creativity of the trainee teachers in the aspects of musical creativity and general creativity?

Research question six investigated the level of creativity of music major trainee teachers in Malaysian in the aspect of musical creativity and general creativity. Musical creativity and general creativity were analysed descriptively using mean and standard deviation. The pattern of performances for musical creativity and its dimension, and general creativity and its components were formed. The data of general creativity were presented in the form of raw scores, standard sum score, and average scores.

4.7.1 Descriptive Statistics of Musical Creativity

The musical creativity score was obtained from the Composition Test. The components in the musical creativity were creative dimension (musical fluency, musical originality, musical elaboration, musical resistance to premature closure, musical abstractness of title), technical goodness (craftsmanship and musical syntax), aesthetic appeal (musical sensitivity), and repetition of song. The score of musical creativity was obtained by adding the scores of all the nine components above.

As shown in Table 4.48, the mean for musical creativity was 42.14, and the standard deviation was 11.99. The median was 41.00 while the range was from a minimum of 17.00 to the maximum of 70.00. This indicates that the trainee teachers' level of musical creativity is moderate (60.20%).

To explore the levels of components in musical creativity, the mean, and standard deviation, median, minimum, and maximum scores of each component is presented in Table 4.48.

First, the data show that the mean for the creative dimension were in the range of 3.74 to 4.70, (4 is the midpoint of the 7-point scale). In the creative dimension there were five components: musical fluency, musical originality, musical elaboration, musical resistance to premature closure, and musical abstractness of title. The mean score for musical fluency was 4.13, and the standard deviation was 1.28. The median was 4.00 while the range was 1.00 to 7.00. As for musical originality, the mean was 3.83, and the standard deviation was 1.63. The median for originality was 4.00 while the range was 1.00 to 7.00.

Besides that, the results also reported that the mean score for musical elaboration was 3.92, and the standard deviation was 1.75. The median was 4.00 while the range was 1.00 to 7.00. Musical resistance to premature closure had a mean score of 3.74, and the standard deviation *SD* was 1.51. The median of musical resistance to premature closure was 4.00 while the range was 1.00 to 7.00. For musical abstractness of title, the mean score was 4.70, and the standard deviation was 1.09. The median was 5.00 while the range was 2.00 to 7.00. The creative dimension scores were obtained by adding the scores of all the five components above. The mean score for creative dimension was 20.02, and the standard deviation was 6.40. The median was 19.00 while the range was 7.00 to 35.00.

Technical goodness was the second dimension in musical creativity. This second dimension consisted of craftsmanship and musical syntax. Craftsmanship had a mean score of 4.23, and the standard deviation was 1.58. The median of craftsmanship was 4.00 while the range was 1.00 to 7.00. As for musical syntax, the mean score was 4.16, and the standard deviation was 1.60. The median was 4.00 while the range was 1.00 to 7.00. The scores for technical goodness were obtained by adding the scores of craftsmanship and musical syntax. Hence, the mean score for technical goodness was

8.35, and the standard deviation was 3.05. The median was 8.00 while the range was 2.00 to 14.00.

Table 4.48

Means, Standard Deviation, Median, Minimum, and Maximum Scores of Components of Musical Creativity

Variables	Mean	*SD*	Median	Minimum	Maximum	Skewness	Kurtosis
Creative Dimension							
Musical Fluency	4.13	1.58	4.00	1.00	7.00	.201	-.682
Musical Originality	3.83	1.63	4.00	1.00	7.00	.251	-.923
Musical Elaboration	3.92	1.75	4.00	1.00	7.00	.329	-.971
Musical Resistance to Premature Closure	3.74	1.51	4.00	1.00	7.00	.145	-.687
Musical Abstractness of Title	4.70	1.09	5.00	2.00	7.00	-.267	.010
Total Creative Dimension	20.02	6.40	19.00	7.00	35.00	.336	-.339
Technical Goodness							
Craftsmanship	4.23	1.58	4.00	1.00	7.00	-.116	-.675
Musical Syntax	4.16	1.60	4.00	1.00	7.00	.105	-.891
Total Technical Goodness	8.35	3.05	8.00	2.00	14.00	.026	-.768
Aesthetic Appeal							
Musical Sensitivity	3.76	1.69	4.00	1.00	7.00	.128	-.968
Repetition of Song	5.98	0.82	6.00	4.00	7.00	-.655	.135
MUSICAL CREATIVITY	42.14	11.99	41.00	17.00	70.00	.313	-.463

Note. Each component in the composition test has a maximum score of 7.

The third dimension in musical creativity was aesthetic appeal (musical sensitivity). The musical sensitivity had a mean score of 3.76, and the standard deviation was 1.69. The median was 4.00 while the range was 1.00 to 7.00.

The fourth dimension in musical creativity was repetition of song. The mean value of repetition of song was 5.98, and the standard deviation was .82. The median of repetition of song was 6.00 while the range was 4.00 to 7.00.

To determine whether musical creativity score is in a normal distribution, two statistical analyses that are the kurtosis and skewness were conducted. A z-value for skewness or kurtosis that exceeds ±1.96 critical values indicated that the assumption of normality was rejected at the distribution of .05 probability level. As presented in Table 4.48, the distributions of scores for all components of musical creativity were not marked skewed. Hence, it can be concluded that the mean distribution of musical creativity and its components were considered normal.

4.7.2 Pattern of Performance for Creative Dimension

A comparison between the mean scores of components of creative dimension shown in Table 4.48 indicates that musical abstractness of title recorded the highest mean score (M = 4.70, SD = 1.09) and musical resistance to premature closure recorded the lowest mean score (M = 3.74, SD = 1.41).

The pattern of performance for the creative dimension indicates that the trainee teachers were more creative in terms of musical abstractness of title and musical fluency, but less creative in terms of musical originality and musical resistance to premature closure. This means that the trainee teachers demonstrated the ability to produce abstract titles (musical abstractness of title) and create musical ideas fluently (musical fluency) but showed less ability to produce original and unique ideas (musical originality). Their ability to resist premature closure (musical resistance to premature closure) was evident.

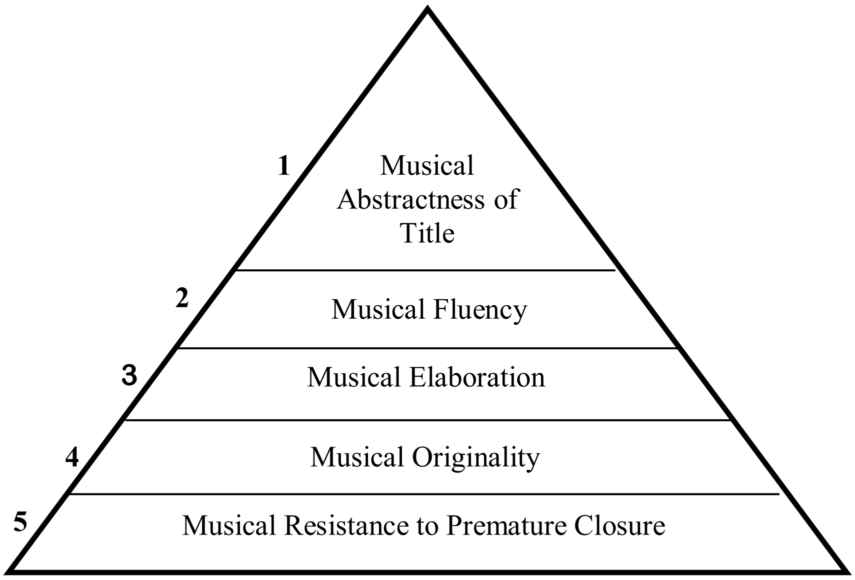

Figure 4.1 The Pattern of Performance of the Creative Dimension of Musical Creativity

4.7.3 Pattern of Performance for Technical Goodness

There were two components in the technical goodness dimension namely craftsmanship and musical syntax. Craftsmanship concerns the technical mastery of tonal and rhythmic elements, and musical syntax concerns the ability to which the tonal and rhythmic patterns in a composition are structured in a logical manner and has music sense. The results show that the trainee teachers were equally good in both components and the mean score of craftsmanship was slightly higher than the mean score of musical syntax.

4.7.4 Pattern of Performance for Dimensions in Musical Creativity

There were four dimensions in musical creativity namely creative dimension, technical goodness, musical sensitivity, and repetition of song. The results comparing the mean scores of dimensions in musical creativity are shown in Table 4.48. From the mean score, the pattern of performance of the dimensions in musical creativity was arranged as presented in Figure 4.2. The average mean score of creative dimension (mean score of creative dimension divided by five) and an average mean score of technical goodness (mean score of technical goodness divided by two) were considered in order to compare the level of performance between the four dimensions.

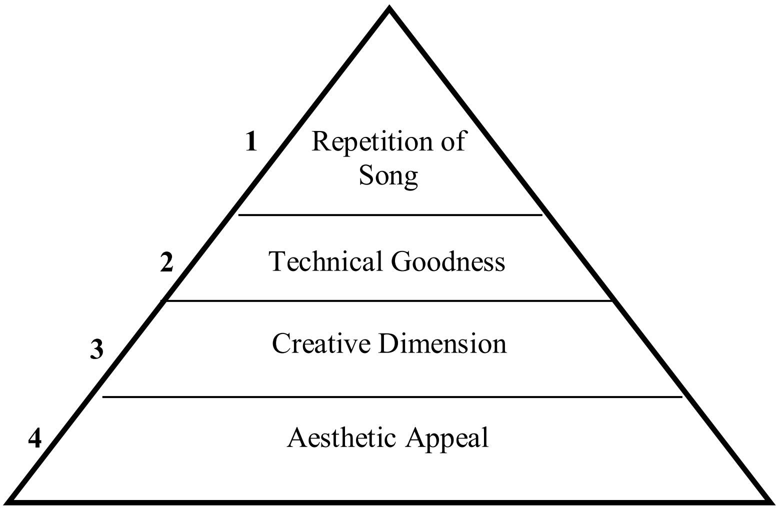

Figure 4.2 *The Pattern of Performance of the Dimensions in Musical Creativity*

Findings documented that repetition of song recorded the highest mean score (M = 5.98, SD = .82) and musical sensitivity (aesthetic appeal) had the lowest mean score (M = 3.76, SD = 1.69). The technical goodness dimension had a higher mean score (M = 4.18, SD = 1.53) than the creative dimension (M = 4.00, SD = 1.28).

This means that the trainee teachers repeated the composition accurately but the compositions were less expressive. The results suggest that the trainee teachers had the ability to perform technical mastery in their compositions. Their technical mastery was higher compared to their creative abilities.

4.7.5 Pattern of Performance for Components in Musical Creative

The pattern of performance for the nine components of musical creativity is presented in Figure 4.3. The findings documented that the highest mean score of musical creativity was repetition of song and the lowest mean score was musical resistance to premature closure. The craftsmanship and musical syntax components had higher mean scores than the musical fluency, musical elaboration, musical originality, and musical resistance to premature closure.

The pattern of performance of the components of musical creativity indicates that the trainee teachers were good at repeating the composition that they composed (repetition of song). The degree of sameness between the first playing and the second playing of the composition was high. The results also reveal that the trainee teachers were skilful in their mastery in tonal centre and rhythmic regularity (craftsmanship). They were also able to structure the composition in a logical manner so that the music makes sense (musical syntax). The results also suggest that the trainee teachers were able to compose in a structured manner and the music makes sense (musical syntax).

On the contrary, the pattern of performance indicates that the trainee teachers were less creative compared to their technical mastery in composing. The trainee teachers were less able to compose musically expressive (musical sensitivity) melodies. They failed to capture the *feelingful* response. The results also reveal that the trainee teachers were unable to resist closure to an idea. Their ability to keep open an idea long enough before going to the next new idea was weak.

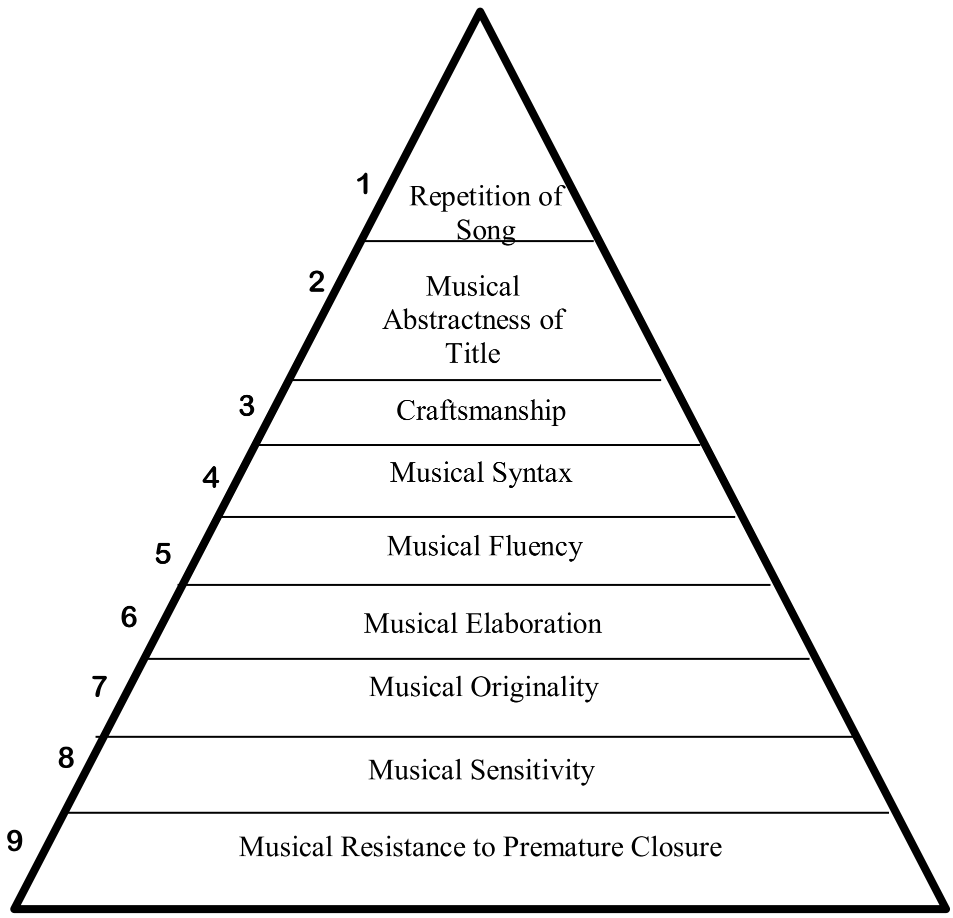

Figure 4.3. The Pattern of Performance of Musical Creativity

4.7.6 Descriptive Statistic of General Creativity

The General creativity score was obtained from the Torrance Test of Creativity Thinking Figural Creativity Form A. The five components in the general creativity were figural fluency, figural originality, figural elaboration, figural resistance to premature closure, and figural abstractness of title. The sum of standard score was obtained by adding the score of the five components above.

The creativity index of general creativity was obtained by adding the average standard scores of figural fluency, figural originality, figural elaboration, figural abstractness of title, figural resistance of premature closure and the 13 creative strengths. The 13 creative strengths in TTCT are emotional expressiveness, storytelling articulateness, movement or action, expressiveness of titles, synthesis of incomplete figures, synthesis of lines or circles, unusual visualization, internal visualization, extending or breaking boundaries, humour, richness of imagery, colourfulness of imagery and fantasy.

To examine the level of creativity in general creativity, the mean, standard deviation, median, minimum, and maximum scores of sum of standard score, creative index, and each component in general creativity are presented in Table 4.49.

The mean score for the sum of standard score of general creativity was recorded at 509.79, and the standard deviation was 48.97. The median was 511.00 while the maximum was 644.00 and the minimum was 317.00. The mean score for the creative index was 111.33, and the standard deviation was 11.19. The median was 111.40. The maximum was 141.00 and the minimum was 66.00.

Table 4.49 also describes the mean score for the components in the general creativity. The mean score for fluency was 105.28, and the standard deviation was 12.81. The median was 107.00 while the range was from 62.00 to 133.00. As for originality, the mean score was 104.04, and the standard deviation was 14.02. The median was 105.00 and the range was from 50.00 to 149.00. Subsequently elaboration had a mean score of 97.87, and the standard deviation was 16.02. The median of elaboration was 97.00 and the range was 65.00 to 138.00. As for the abstractness of title the mean score was 94.74, and the standard deviation was 22.11. The median was 93.00 and the range was from a minimum of 0 to a maximum of 160.00. As for resistance to premature closure, the mean score was 106.52, and the standard deviation was 16.46. It had a median of 107.00 and a range of 40.00 to 135.00.

Table 4.49

Descriptive Statistics of Components of General Creativity

GENERAL CREATIVITY	Mean	*SD*	Median	Minimum	Maximum	Skewness	Kurtosis
Figural Fluency	105.28	12.81	107.00	62.00	133.00	-.600	.553
Figural Originality	104.05	14.02	105.00	50.00	149.00	.016	.601
Figural Elaboration	97.87	16.02	97.00	65.00	138.00	.101	-.591
Figural Resistance to Premature Closure	106.52	16.46	107.00	40.00	135.00	-.579	.657
Figural Abstractness of Title	94.74	22.11	93.00	0.00	160.00	.219	-.865
SUM OF STANDARD SCORE	509.79	48.97	511.00	317.00	644.00	.304	.356
CREATIVE INDEX	111.33	11.19	111.40	66.00	141.00	-.107	1.205

The data of skewness and kurtosis are shown in Table 4.49. The data show that the skewness and kurtosis values of general creativity and its components did not exceed ±1.96. Hence the distributions of scores for figural fluency, figural originality, figural elaboration, figural resistance to premature closure and figural abstractness of title were normally distributed and suitable for parametric inferential statistical analyses.

4.7.7 Pattern of Performance for General Creativity

The results presented in Figure 4.4 indicate that in terms of sum of standard scores, figural resistance to premature closure had the highest score and figural abstractness of title had the lowest score. This means that the trainee teachers were able to resist closing on an idea (figural resistance to premature closure) and had the ability to produce many ideas involving imagination (figural fluency). But the trainee teachers were weak in the ability to elaborate (figural elaboration), synthesise, and organise the thought process to capture the essence of the information (figural abstractness of title).

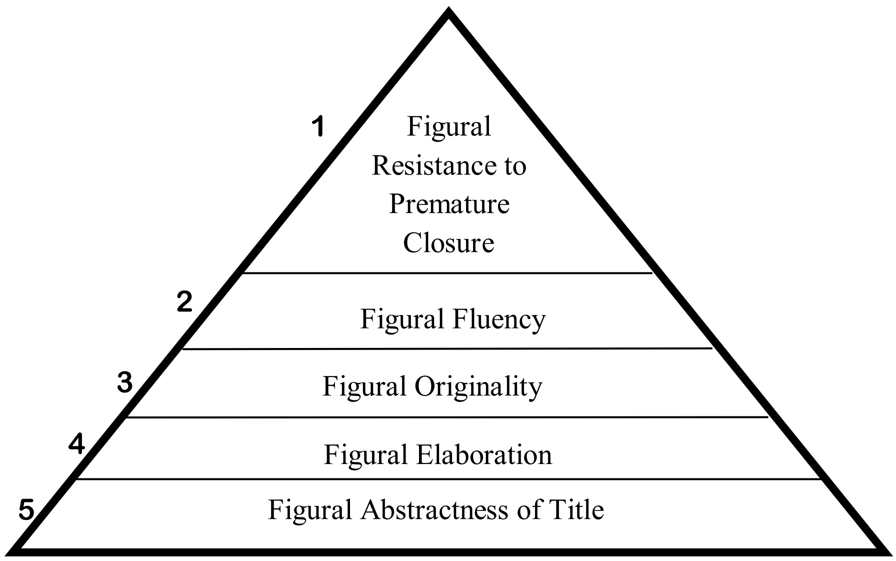

Figure 4.4. The Pattern of Performance of General Creativity

The creative abilities of the general creativity (figural fluency, figural originality, figural elaboration, figural resistance to premature closure and figural abstractness of title) and the creative abilities of the musical creativity in the creative dimension (musical fluency, musical originality, musical elaboration, musical resistance to premature closure and musical abstractness of title) can be considered as similar though they are abilities in a different context. However, the pattern of performance for general creativity was found to be different from the pattern of performance of musical creativity.

4.7.8 Comparison of General Creativity Results with Study by Torrance

Torrance (2008) studied 70,093 students and provided data of the normative study in the Torrance Tests of Creative Thinking Norms-Technical Manual (Torrance, 2008). The results comparing the findings of this study and of Torrance's study are shown in Table 4.9. It was found that the findings in this study were quite similar to the findings of the study conducted by Torrance. In this study, the raw scores were used in comparison to ensure consistency in measurement with the Torrance study (Torrance, 2008).

As shown in Table 4.50, the mean value of figural fluency, figural originality, and figural resistance to premature closure were slightly higher than the mean score in Torrance's study. However, figural elaboration and figural abstractness of title had lower mean values. The results show that the creative abilities of the trainee teachers in this study were slightly higher the creative abilities of students of the similar age in the United States in three of the five components of general creativity.

Table 4.50

Comparison of Raw Score between the Torrance Test of Creative Thinking and Study by Torrance

General Creativity	Raw Score of Torrance Test of Creative Thinking			
	This Study (n = 159)		Torrance (2008) (n = 70,093)	
	Mean	*SD*	Mean	*SD*
Figural Fluency	25.60	5.97	23.6	8.9
Figural Originality	18.62	4.86	17.4	6.9
Figural Elaboration	6.15	1.69	6.40	2.1
Figural Abstractness of Title	8.99	5.22	10.5	6.3
Figural Resistance to Premature Closure	15.36	3.43	13.9	4.4
Average Standard Score	101.96	9.79	98.6	13.7
Creativity Index	111.33	11.19	108.8	15.7

Note. Torrance's data are from the United States.

The average standard score shows that the trainee teachers in this study had a higher creative level in the average score of general creativity compared to the students of similar age in the United States. The creative index also indicates that the trainee teachers in this study had higher general creativity plus creative strengths than the students in Torrance's study.

4.7.9 Summary of Results for Research Question Six

The results of the analysis of the nature of musical creativity and general creativity are summarised as follows:

1. The trainee teachers in this study showed moderate musical creativity.
2. In the components of musical creativity, the trainee teachers recorded the highest score in repetition of song and the lowest score in musical resistance to premature closure. This means that there was a high sameness in the first and the second playing of the composition composed. The trainee teachers who were good in repeating composition were less creative in musical resistance to premature closure.
3. In the components of creative dimension in musical creativity, the trainee teachers were more creative in musical abstractness of title and musical fluency and less creative in musical originality and musical resistance to premature closure. This means that the trainee teachers were good at producing abstract ideas (musical abstractness of title) and create ideas (musical fluency) but had less ability to create original ideas (musical originality) and when they create ideas, they tended to leap to the conclusions prematurely without considering available information (musical resistance to premature closure).

4. The trainee teachers were better in craftsmanship and musical syntax than creative dimension and aesthetic appeal. They are good in the mastery of the technical skills in composing (craftsmanship and musical syntax) but weak in the creation of new ideas (creative dimension) and aesthetic sensitivity to music (musical sensitivity).

5. In the components of general creativity, the trainee teachers were more creative in figural resistance to premature closure and figural fluency and were less creative in figural elaboration and figural abstractness of title. This means that the trainee teachers were good in exploring ideas hence resisting the tendency to leap to conclusion prematurely (figural resistance to premature closure). They were also good at creating ideas (figural fluency). However, the trainee teachers were less creative in evaluating and elaborating ideas to make it more meaningful (figural elaboration). They were also less creative in synthesizing and organising thoughts to produce abstract ideas (figural abstractness of title).

6. The trainee teachers in the teacher education institution who were majoring in music education were equally creative compared to student in the United States. Figural fluency, figural originality, and figural resistance to premature closure had a higher score than sample of Torrance’s (2008) study.

4.8 Data Analysis for Research Question Seven

What are the relationships between musical creativity and general creativity among the trainee teachers?

Research question seven investigated the relationships between musical creativity, general creativity, and their respective components. Musical creativity and general creativity were in ratio data. Hence, to investigate the relationships, parametric test using Pearson Product-moment correlations was employed (Creswell, 2008).

First, the relationships between creative dimension, technical goodness, aesthetic appeal, repetition of song, and musical creativity were analysed. This was followed by the analysis of the relationships between the components of general creativity. Then, the relationships between the creative dimension, technical goodness, aesthetic appeal, repetition of song, and sum of standard score and creative index of general creativity were investigated. Finally, the predictors of musical creativity and general creativity among their components were presented.

4.8.1 The Relationships among the Components of Musical Creativity

There were nine components in the musical creativity score which were musical fluency, musical originality, musical elaboration, musical abstractness of title, musical resistance to premature closure, craftsmanship, musical syntax, musical sensitivity, and repetition of songs. These components were grouped into four dimensions. There were the creative dimension which consisted of musical fluency, musical originality, musical elaboration, musical abstractness of title and musical resistance to premature closure. The technical goodness dimensions consisted of craftsmanship and musical syntax. The musical sensitivity was the third dimension and repetition of song was the fourth dimension. The results of descriptive analysis on the inter-correlation among the nine components are presented in Table 4.51.

Table 4.51

Inter-correlations of Components of Musical Creativity

Inter-correlation	MFLU	MORI	MELA	MRES	MABS	CRFT	MSYX	MSEN	REPT
MFLU		.72**	.77**	.83**	.43**	.61**	.61**	.68**	.00
MORI			.74**	.73**	.46**	.57**	.59**	.67**	-.03
MELA				.78**	.40**	.56**	.60**	.66**	-.01
MRES					.40**	.73**	.72**	.76**	.11
MABS						.43**	.47**	.52**	.04
CRFT							.90**	.80**	.25**
MSYX								.86**	.20*
MSEN									.17*
REPT									

Note. **Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).

MFLU: Musical Fluency
MORI: Musical Originality
MELA: Musical Elaboration
MABS: Musical Abstractness of Title
MRES: Musical Resistance to Premature Closure
CRFT: Craftsmanship
MSYX: Musical Syntax
MSEN: Musical Sensitivity
REPT : Repetition of Song

The strongest correlation was found between craftsmanship and musical syntax. Craftsmanship and musical syntax were highly correlated (r = .90, p < .01) and the correlation was very strong and positive. The results suggest that a trainee teacher who is good in the mastery of tonal and rhythm regularity (craftsmanship) is most likely to be good at structuring composition in a logical manner that makes sense (musical syntax).

The data also show a strong correlation between the components in technical goodness and aesthetic appeal. The correlation between musical sensitivity and musical syntax (r = .86, p < .01), and musical sensitivity and craftsmanship (r = .80, p < .01) were strong and positive. It means that a trainee teacher who is good in structuring composition in a logical manner that makes sense (musical syntax) is also able to compose a musically expressive composition (musical sensitivity). This trainee teacher is also likely to be good in the mastery of tonal and rhythm regularity (craftsmanship).

The data in Table 4.51 also show that there were significant correlations between components in the creative dimensions. Musical fluency correlated with musical resistance to premature closure ($r = .83, p < .01$), musical originality ($r = .72, p < .01$), and musical elaboration ($r = .77, p < .01$). The correlation was strong and positive. However, the correlation between musical fluency and musical abstractness of title was weak ($r = .43, p < .01$) but significant and positive. The results suggest that a trainee the teachers who is creative in musical fluency, is also creative in musical resistance to premature closure and musical elaboration. He or she is also likely to be creative in musical abstractness of title.

This means that a trainee teacher who is creative in producing musical ideas (musical fluency), is also able to resist closing on an idea (musical resistance to premature closure), produce originality ideas (musical originality) and build upon a musical idea by extending, reshaping, and refining the musical elements (musical elaboration). However, the trainee teacher tend to be weak in producing an abstract title that captures the essence of the composition.

The correlation between musical fluency and craftsmanship ($r = .61, p < .01$), musical syntax ($r = .61, p < .01$), and musical sensitivity ($r = .68, p < .01$) were moderate and positive. The results suggest that the trainee teachers who are creative in musical fluency are moderately creative in craftsmanship, musical syntax, and musical sensitivity. This means that a trainee teacher who is able to produce musical ideas fluently (musical fluency) is likely to have technical mastery in tonal and rhythmic elements (craftsmanship), able to compose a structured composition in a logical manner so that the music makes sense (musical syntax), and able to compose an expressive and musical composition (musical sensitivity).

Based on the results in Table 4.51, it was found that there were correlations between musical originality and musical elaboration (r = 74, $p < .01$), musical originality and musical fluency ($r = .72$, $p < .01$), and musical originality and musical resistance to premature closure ($r = .74$, $p < .01$). The correlation was strong and positive. However, there was a weak correlation between musical originality and musical abstractness of title ($r = .46$, $p < .01$). Though weak the correlation was significant and positive.

The results suggest that trainee teachers, who are creative in musical originality, are generally creative in musical fluency, musical elaboration, and musical resistance to premature closure. This means that a trainee teacher who has the ability to compose a unique composition (musical originality), also has the ability to produce musical ideas (musical fluency), built upon the musical idea by extending, reshaping, and refining the musical elements (musical elaboration), and resist closing on an idea (musical resistance to premature closure). However, this trainee teacher is weak in producing an abstract title that captures the essence of the composition (musical abstractness of title).

The correlation between musical originality and craftsmanship ($r = .57$, $p < .01$), musical syntax ($r = .59$, $p < .01$), and musical sensitivity ($r = .67$, $p < .01$) were moderate and positive. The data suggest that trainee teachers who are creative in musical originality are likely to be creative in craftsmanship, musical syntax, and musical sensitivity. It means that a trainee teacher who is able to produce unique ideas (musical originality) is likely to have technical mastery in tonal and rhythmic elements (craftsmanship), has the ability to compose a composition that are structured and in a logical manner and the music that makes sense (musical syntax), and has the ability to compose an expressive and musical composition (musical sensitivity).

The data in Table 4.51 also show the correlation between musical elaboration and other components in musical creativity. The data indicate that musical elaboration correlated strongly with musical fluency ($r = .77, p < .01$), musical originality ($r = .74, p < .01$), and musical resistance to premature closure ($r = .78, p < .01$). The correlation was positive. Musical elaboration also correlated moderately with craftsmanship ($r = .56, p < .01$), musical syntax ($r = .60, p < .01$), and musical sensitivity ($r = .66, p < .01$). However, the correlation between musical elaboration and musical abstractness of title was weak ($r = .40, p < .01$). All the correlations were positive.

The results suggest that trainee teachers, who have creative musical elaboration, are creative in musical fluency, musical originality, musical resistance to premature closure. However, they are moderately creative in craftsmanship, musical syntax, and musical sensitivity. These trainee teachers are weak in musical abstractness of title.

This means that a trainee teacher who has the ability to compose in detail (musical elaboration), also has the ability to compose a unique composition (musical originality), produce ideas (musical fluency), and resist closing on an idea (musical resistance to premature closure). However, this trainee teacher is likely to have technical abilities (craftsmanship and musical syntax), and the ability to compose a musical piece (musical sensitivity). This trainee teacher is also likely to have the ability in producing an abstract title that captures the essence of the composition (musical abstractness of title).

The data in Table 4.51 show that musical resistance to premature closure correlated strongly with musical fluency ($r = .83, p < .01$), musical originality ($r = .73, p < .01$), and musical elaboration ($r = .78, p < .01$). Musical resistance to premature closure also correlated strongly with craftsmanship ($r = .73, p < .01$), musical syntax ($r = .72, p < .01$), and musical sensitivity ($r = .76, p < .01$). The correlations were positive. The results suggest that trainee teachers who are creative in musical resistance to premature closure are also creative in musical fluency, musical originality, musical elaboration, craftsmanship, musical syntax, and musical sensitivity. However, the data in Table 4.51 indicate that musical abstractness of title had a weak correlation with musical abstractness of title ($r = .40$, $p < .01$). Though the correlation was weak, it was significant and positive.

The results suggest that trainee teachers who are creative in resistance to premature closure are also creative in musical fluency, musical originality, musical elaboration, craftsmanship, musical syntax, and musical sensitivity. However, the trainee teacher is weak in musical abstractness of title.

It means that a trainee teacher who is able to resist to closing to an idea are able to produce ideas (musical fluency), has the ability to compose in detail (musical elaboration), has the ability to compose a unique composition (musical originality), has good technical abilities (craftsmanship and musical syntax), and good ability to compose an expressive piece (musical sensitivity). However, the trainee teacher is weak in producing an abstract title that captures the essence of the composition (musical abstractness of title).

The data in Table 4.51 also show that musical abstractness of title had weak correlations with all components in creative dimension and technical goodness. Musical abstractness of title correlated weak with musical fluency ($r = .43$, $p < .01$), musical originality ($r = .46$, $p < .01$), musical elaboration ($r = .40$, $p < .01$), and musical resistance to premature closure ($r = .40$, $p < .01$). Musical abstractness of title also correlated weakly with craftsmanship ($r = .43$, $p < .01$), and musical syntax ($r = .47$, $p < .01$). However, it correlated moderately with musical sensitivity ($r = .52$, $p < .01$). The results suggest that trainee teachers who are creative in musical abstractness of title are likely to be creative in musical fluency, musical originality, musical elaboration, and musical resistance to premature closure. They are also likely to be creative in craftsmanship, and musical syntax. However, they are only moderately creative in musical sensitivity.

This means that a trainee teacher who is creative in producing abstract titles are likely to be creative in producing good original musical ideas (musical fluency and musical originality), has the ability to extend or reshape musical ideas (musical elaboration), and resist closure to an idea (resistance to premature closure). These trainee teachers are probably good in technical mastery of tonal and rhythm (craftsmanship), and able to structure logical manner music that makes sense (musical syntax). Furthermore, they might have the ability to compose musically expressive compositions (musical sensitivity).

The data also indicate that repetition of song had correlations with some of the components in musical creativity. Repetition of song correlated with craftsmanship ($r = .25$, $p < .01$), musical syntax ($r = .20$, $p < .05$) and musical sensitivity ($r = .17$, $p < .05$). The correlation was very low but positive. The results suggest that trainee teachers who exhibit a good ability in the repetition of song, also exhibit the ability in craftsmanship, musical syntax and musical sensitivity. But the ability is weak.

This means that a trainee teacher who is good at repeating his or her composition (repetition of song) is not necessarily creative musically (components in creative dimension). But a trainee teacher who is good at repeating his or her composition probably has the ability of technical mastery of tonal and rhythm (craftsmanship), able to structure logical manner music that makes sense (musical syntax), and probably composes musically expressive compositions (musical sensitivity).

A detailed observation on the compositions composed by the trainee teachers revealed that the judges rated highly for the component of repetition of song for the simple and short compositions. This is probably because when the composition is simple and short, it is easily repeated. This could also be the reason why the correlations between repetitions of song and the components of creative dimensions were not significant. The analysis of the compositions also revealed that compositions that received high ratings in repetition of songs received the lowest rating in the creative dimensions. The ability to repeat a short composition does not require creative abilities. However, the ability to repeat a composition requires some form of technical abilities and musical sensitivity.

In conclusion, the inter-correlation between the components of musical fluency, musical originality, musical elaboration, and musical resistance to premature closure were strong and significant. The inter-correlation between musical abstractness of title and musical fluency, musical abstractness of title and musical originality, musical abstractness of title and musical elaboration, and musical abstractness of title and musical resistance to premature of closure were significant but weak. Craftsmanship correlated strongly with musical syntax and musical sensitivity. The inter-correlation of repetition of song was low and not significant with all of the components of creative dimensions, however, repetition of song correlates weakly with technical goodness and musical sensitivity.

This means that trainee teachers who are able to create ideas, are able to create original ideas, elaborate ideas, resist closing on an idea, have technical mastery, able to compose in a logical manner, and able to compose expressive compositions. However, they are not necessarily able to produce an abstract idea or repeat similar compositions. The trainee teachers who are able to repeat a composition accurately do not necessary have musical creativity abilities.

A detailed analysis of the judges rating of musical creativity discovered that there might be a tendency of the judges to give a similar score to craftsmanship and musical syntax. The scoring could be related. The very strong correlation between these two variables could mean that the judges who rated high for craftsmanship could have rated high for musical syntax to the similar trainee teacher.

4.8.2 The Relationship among the Components of General Creativity

Inter-correlations among the components in general creativity were computed by Pearson product-moment correlations. There were five components in the general creativity which were figural fluency, figural originality, figural elaboration, figural abstractness of title, and figural resistance to premature closure.

Table 4.52 presents the inter-correlation matrix among the five components of general creativity that are figural fluency, figural originality, figural elaboration, figural resistance to premature closure, and figural abstractness of title.

Table 4.52

Inter-correlations of Components of General Creativity

Inter-correlation	FFLU	FORI	FELAB	FABS	FRES	CI
Figural Fluency		.72**	.09	.10	.49**	.61**
Figural Originality			.14	.19**	.41**	.67**
Figural Elaboration				.23**	.11	.56**
Figural Abstractness of Title					.08	.62**
Figural Resistance to Premature Closure						.58**
Creative Index						

Note. **Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).
FFLU: Musical Fluency
FORI: Musical Originality
FELA: Musical Elaboration
FABS: Musical Abstractness of Title
FRES: Musical Resistance to Premature Closure

The results show that the highest correlation between the components of general creativity was between figural fluency and figural originality. Figural fluency and figural originality were strongly correlated (r = .72, p < .05). Figural fluency also correlated with figural resistance to premature closure (r = .49, p < .05). However the correlation though positive was weak. Figural fluency had no correlation with figural elaboration (r = .09, p > .05) and figural abstractness of title (r = .10, p > .05). The results suggest that trainee teachers who are creative in figural fluency are also creative in figural originality. They are also likely to be creative in figural resistance to premature closure. Data also suggest that figural fluency is independent of figural elaboration and figural abstractness of title.

This means that a trainee teacher who is creative in producing ideas (figural fluency) is creative in producing unique ideas (figural originality). This trainee teacher is also likely to be able to resist closing on an idea (figural resistance to premature closure). However, a trainee teacher who is creative in producing ideas not necessarily has the ability to elaborate ideas (figural elaboration) and produce abstract ideas (figural abstractness of title).

The data also indicate that figural originality correlated with figural fluency (r = .72, p < .05), figural abstractness of title (r = .19, p < .05), and figural resistance to premature closure (r = .41, p < .05). Figural originality had strong and positive correlation with figural fluency. Figural originality had a weak correlation with figural resistance to premature closure. Figural originality had very weak correlation with figural abstractness of title. However, there was no correlation between figural originality and figural elaboration (r = .14, p > .05).

The data suggest that trainee teachers who are creative in figural originality are creative in figural fluency. They are also creative in figural resistance to premature closure, and likely to be creative in abstractness of title. Figural originality is independent of figural elaboration.

This means that a trainee teacher who is creative in producing unique ideas (figural originality) is also creative in producing many ideas (figural fluency). He or she is likely to be able to resist closing to an idea (figural resistance to premature closure), and create abstract ideas (figural abstractness of title). However, a trainee teacher who is creative in producing unique ideas need not necessarily have the ability to elaborate ideas, or make ideas more meaningful and valuable (figural elaboration).

The data in Table 4.52 show that figural elaboration was correlated to figural abstractness of title. The correlation was very weak but significant and positive. Figural elaboration had no significant correlation with figural fluency, figural originality, and figural resistance to premature closure.

The results suggest that trainee teacher who is creative in figural elaboration is likely to be creative in figural abstractness of title. Data also shows that figural elaboration was independent of figural fluency, figural originality, and figural resistance to premature closure.

This means that a trainee teacher who is good in develops and elaborate ideas (figural elaboration) are likely to be good in producing abstract ideas (figural abstractness of title). However, this trainee teacher does not necessarily have the ability to create ideas fluently (figural fluency), create original ideas (figural originality), and resist closing to an idea (figural resistance to premature closure).

The data in Table 4.52 show that figural abstractness of title correlated with figural originality (r = .19, p < .05) and figural elaboration (r = .23, p < .05). The correlation was very weak but positive and significant. Figural abstractness of title had no significant correlation with figural fluency (r = .10, p > .05), and figural resistance to premature closure (r = .08, p > .05). The results suggest that trainee teachers who are creative in figural abstractness of title are likely to be creative in figural elaboration. Figural abstractness of title is independent of figural fluency and figural resistance to premature closure.

This means that a trainee teacher who is good in producing abstract ideas (figural abstractness of title) is likely to be good in elaborating ideas (figural elaboration). However, he or she is not necessarily able to create original ideas (figural originality), and resist closing to an idea (figural resistance to premature closure).

Table 4.52 also presents the correlation between figural resistance to premature closure and other components in general creativity. It was found that figural resistance to premature closure had correlation with musical fluency (r = .49, p < .05) and musical originality (r = .41, p < .05). The correlation was weak but positive and significant. There was no significant correlation between figural resistance to premature closure and figural elaboration (r = .11, p > .05) and figural abstractness of title (r = .08, p > .05). The results suggest that trainee teachers who are creative in figural resistance to premature closure are likely to be creative in figural fluency and figural originality. However, figural resistance to premature closure is independent of figural elaboration and figural abstractness of title.

This means that a trainee teacher who has the ability to resist closing on an idea until others have been explored (figural resistance to premature closure) is likely to has the ability to produce many ideas (figural fluency) and produce new and unusual ideas (figural originality). However, he or she is not necessarily able to elaborate ideas (figural elaboration), and produces abstract ideas (figural abstractness of title).

Table 4.52 also presents the correlations of creative index. Creative index correlated with all components of general creativity. The correlations were moderate and positive. The data indicate that trainee teachers who were overall creative were also creative in all the components of general creativity.

4.8.3 The Relationship between Musical Creativity and General Creativity

Table 4.53 shows the inter-correlation of musical creativity and general creativity. The musical creativity score and the creative index of general creativity recorded a weak but significant correlation (r = .21, p < .01). This suggests than musical creativity most likely influences general creativity and vice versa. However, the influence is very weak.

The data in Table 4.53 indicate a significant correlation between musical fluency and figural fluency (r = .17, p < .01), and between musical fluency and figural originality (r =. 23, p < .01). The correlations were significant and positive but very weak. There were no significant correlations between musical fluency and figural elaboration (r = .04, p > .05), figural resistance to premature closure (r = .12, p > .05), and figural abstractness of title (r = .14, p > .05). The results suggest that trainee teachers who are creative in musical fluency are likely to be creative in figural fluency and figural originality. However, trainee teachers who are creative in musical fluency are not necessary creative in figural elaboration figural resistance to premature closure, and figural abstractness of title.

This means that a trainee teacher who is creative in producing musical ideas fluently (musical fluency) are likely to be creative in producing many figural ideas (figural fluency), and the ideas are original (figural originality). However, he or she does not necessarily have the ability to elaborate ideas (figural elaboration), resist closure to an idea (figural resistance to premature closure), and produce abstract ideas (figural abstractness of title).

The data show that musical originality correlated with figural originality (r = .16, p < .01), and figural abstractness of title (r = .16, p < .01). The correlation was significant and positive, however it was very weak. There was no significant correlation between musical originality with figural fluency ($r = .11$, $p > .05$), figural elaboration ($r = .08$, $p > .05$), and figural resistance to premature closure ($r = .15$, $p > .05$). The results indicate that trainee teachers who are creative in musical originality are likely to be creative in figural originality. However, trainee teachers are not creative in figural fluency, figural elaboration, and figural resistance to premature closure.

This means that a trainee teacher who has the ability to produce original and unique musical ideas (musical originality) is likely to be able to produce original and unique figural ideas (figural originality). This trainee teacher is also likely to be able to produce abstract ideas (figural abstractness of title). However, he or she does not necessarily have the ability to create ideas fluently (figural fluency), elaborate ideas (figural elaboration), and resist closure (figural resistance to premature closure).

The data in Table 4.53 also indicate that musical elaboration only correlated with figural originality ($r = .16$, $p < .01$). The correlation was positive but very weak. There was no significant correlation between figural elaboration with figural fluency ($r = .13$, $p > .05$), figural elaboration ($r = .07$, $p > .05$), figural resistance to premature closure ($r = .12$, $p > .05$) and figural abstractness of title ($r = .13$, $p > .05$). The results suggest that the trainee teachers who are creative in musical elaboration are likely to be creative in figural originality. However, they are not necessarily creative in figural fluency, figural elaboration, figural resistance to premature closure and figural abstractness of title.

This means that a trainee teacher who is good at scoring detail to a musical idea (musical elaboration) is likely to be good at producing original ideas (figural originality). This trainee teacher does not necessarily has the ability to create ideas fluently (figural fluency), elaborate ideas (figural elaboration), resist closure (figural resistance to premature closure), and produce abstract ideas (figural abstractness of title).

As for musical resistance to premature closure, the data indicate that it correlated with figural originality (r = .16, p < .01), and figural resistance to premature closure (r = .16, p < .01). The correlation was positive and significant but very weak. There was no correlation between musical resistance to premature closure and figural fluency (r = .10, p > .05), figural elaboration (r = .04, p > .05), and figural abstractness of title (r = .14, p > .05). The results indicate that trainee teachers who are creative in musical resistance to premature closure are likely to be creative in figural originality and figural resistance to premature closure. However, they are not necessarily creative in figural fluency, figural elaboration, and figural abstractness of title.

This means that a trainee teacher who has the ability to resist closure to a musical idea (musical resistance to premature closure) is likely to be able to produce original ideas (figural originality) and avoid making conclusions prematurely (figural resistance to premature closure). However, he or she does not necessarily have the ability to create ideas fluently (figural fluency), elaborate ideas (figural elaboration), and produce abstract ideas (figural abstractness of title).

As shown in Table 4.53, musical abstractness of title correlated with figural fluency (r = .16, p < .01), and figural originality (r = .16, p < .01). The correlation was positive and significant but very weak. There was no correlation between figural abstractness of title with figural elaboration (r = .07, p > .05), figural resistance to premature closure (r = .10, p > .05), and figural abstractness of title (r = .12, p > .05). The results indicate that trainee teachers who are good in musical abstractness of title are likely to be good in figural fluency and figural originality. However, they are not necessarily good in figural elaboration, figural resistance to premature closure and figural abstractness of title.

This means that a trainee teacher who is creative in producing abstract title to a composition (musical abstractness of title) are likely to have the ability to produce idea fluently (figural fluency), and produce original ideas (figural originality). However, he or she is not necessarily able to elaborate the idea (figural elaboration), avoid making conclusions prematurely (figural resistance to premature closure) and produce abstract figural ideas (figural abstractness of title).

The data showed that craftsmanship correlated with figural abstractness of title (r = .17, p < .01). The correlation was positive and significant but very weak. There was no significant correlation between craftsmanship with figural fluency (r = .11, p > .05), figural originality (r = .15, p > .05), figural elaboration (r = .06, p > .05), and figural resistance to premature closure (r = .14, p > .05). Results indicate that trainee teachers who are the best in craftsmanship are likely to be good in the figure abstractness of title but are not necessarily good in figural fluency, figural originality, figural elaboration, and figural resistance to premature closure.

This means that a trainee teacher who has the mastery of technique in tonal and rhythm elements in the composition (craftsmanship) is likely to have the ability to produce abstract ideas (figural abstractness of title). However, this trainee teacher is not necessarily able to produce idea fluently (figural fluency), and produces original ideas (figural originality). He or she is also not necessarily able to elaborate the idea (figural elaboration), and avoid making conclusions prematurely (figural resistance to premature closure).

As for musical syntax, the data showed that it correlated with figural fluency (r = .18, p < .01), figural originality (r = .16, p < .01), figural resistance to premature closure (r = .18, p < .01), and figural abstractness of title (r = .19, p < .01). The correlations were positive and significant but very weak. There was no correlation between musical syntax with figural elaboration (r = .04, p > .05). Results indicate that trainee teachers who are creative in musical syntax are likely to be creative in figural originality, figural resistance to premature closure, and figural abstractness of title. However, these trainee teachers are not necessarily creative in figural elaboration.

This means that a trainee teacher who is able to structure a composition in a logical manner in terms of tonal and rhythm (musical syntax) is likely to be able to produce ideas fluently (figural fluency), produce original ideas (figural originality), resist closure (figural resistance to premature closure), and produce abstract ideas (figural abstractness of title).

As shown in Table 4.53, musical sensitivity correlated with figural resistance to premature closure (r = .16, p < .01), and abstractness of title (r = .17, p < .01). The correlation was positive and significant but very weak. There was no significant correlation between musical sensitivity and figural fluency (r = .09, p > .05), figural originality (r = .07, p > .05), and figural elaboration (r = .03, p > .05). The results indicate that trainee teachers who are creative in musical sensitivity are likely to be creative in figural resistance to premature closure, and abstractness of title. However, they are not necessarily creative in figural fluency, figural originality, and figural elaboration.

This means that a trainee teacher who is able to compose an expressive composition is likely to be able to resist closure on an idea (figural resistance to premature closure), and produce abstract ideas (figural abstractness of title). However, he or she does not necessarily have the ability to produce ideas fluently (figural fluency), produce original ideas (figural originality), and elaborate ideas (figural elaboration). The data in Table 4.53 show that repetition of song did not correlate with any of components of the general creativity. The results indicate that repetition of song is independent of all components in general creativity. This means that a trainee teacher who has the ability to repeat a composition accurate does not necessarily have figural creative abilities.

Table 4.53

Inter-correlations of Components of Musical Creativity and General Creativity

Variables	General Creativity					
	FFLU	FORI	FELAB	FRES	FABS	CI
Musical Creativity						
MFLU	.17*	.23**	.04	.12	.14	.20*
MORI	.11	.16*	-.08	.15	.16*	.14
MELA	.13	.16*	-.07	.12	.13	.14
MRES	.10	.16*	.04	.16*	.14	.20*
MABS	.16*	.16*	-.07	.10	.12	.13
CRFT	.11	.15	.06	.14	.17*	.22**
MSYX	.18*	.16*	.04	.18*	.19*	.27**
MSEN	.09	.07	-.03	.16*	.17*	.16*
REPT	-.03	-.07	.11	-.06	.06	.04
Musical Creativity	.14	.17*	-.01	.18*	.17*	.21**

Note: **Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).

FFLU: Musical Fluency
FORI: Musical Originality
FELA: Musical Elaboration
FABS: Musical Abstractness of Title
FRES: Musical Resistance to Premature Closure
CI: Creative Index

MFLU: Musical Fluency
MORI: Musical Originality
MELA: Musical Elaboration
MABS: Musical Abstractness of Title
MRES: Musical Resistance to Premature Closure
CRFT: Craftsmanship
MSYX: Musical Syntax
MSEN: Musical Sensitivity
REPT : Repetition of Song

Components that correlated with creative index of general creativity were musical fluency (r = .17, p < .01), musical resistance to premature closure (r = .20, p < .01), craftsmanship (r = .22, p < .01), musical syntax (r = .27, p < .01), and musical sensitivity (r = .16, p < .01). However, the correlations were very weak though positive and significant. This means that trainee teachers who are creative in musical fluency or musical resistance to premature closure or craftsmanship or musical syntax or musical sensitivity are likely to be creative in general creativity.

The results of the correlation analyses between the components of musical creativity and general creativity indicate that these two types of creativities are probably related to one another. This is confirmed by the significant correlation between creative index and musical creativity. This implies that trainee teachers who are highly creative in musical creativity are likely to be highly creative in general creativity and vice versa.

4.8.4 Summary of Results for Research Question Seven

1. The trainee teachers who are creative in musical fluency are generally also creative in musical originality, musical elaboration, and musical resistance to premature closure, but are not necessarily creative in the musical abstractness of title.
2. The trainee teachers who are creative in craftsmanship are generally creative in musical syntax, musical sensitivity, and musical resistance to premature closure.
3. The trainee teachers who are creative in figural fluency are generally also creative in figural originality. But they are not necessarily creative in figural elaboration, figural abstractness of title and figure resistance to premature closure.
4. The trainee teachers' musical creativity and general creativity are related to one another. This is confirmed by the low significant correlation between creative index and musical creativity. This implies that trainee teachers who are highly creative in musical creativity are more likely to be highly creative in general creativity and vice versa.

4.9 Data Analysis for Research Question Eight

Are there any significant relationship between musical creativity and personal variables among the trainee teachers?

Research question eight investigated the relationships between musical creativity and personal variables such as gender, ethnicity, academic grades, and socioeconomic status.

Descriptive statistic and inferential statistic were used to answer research question eight. Firstly, descriptive analyses of the mean scores of musical creativity by personal variables were discussed. This was followed by the analysis of the relationship between musical creativity and personal variables. The significant differences in mean scores between musical creativity and variables such as gender, ethnicity, academic years, and socioeconomic status were analysed using independent sample *t*-test and one-way ANOVA. Tukey HSD was employed to determine which group of variables had a significant difference in the analysis. The level of significance was set at $p < .05$ for all statistical tests.

4.9.1 The Relationship between Musical Creativity and Gender

Table 4.54 presents the means and standard deviations of musical creativity according to gender. The data show that the mean score of musical creativity of the male trainee teachers was 45.08, and the standard deviation was 11.19. The mean score for the female trainee teachers was 40.76, and the standard deviation was 12.16. This shows that the male trainee teachers had a higher mean score than the female trainee teachers in the musical creativity score.

Table 4.54

Means and Standard Deviations for Musical Creativity by Gender

Variables	Gender					
	Male (*n* = 51)		Female (*n* = 108)		Total Score (*n* = 159)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Musical Creativity	45.08	11.19	40.76	12.16	42.14	11.99

Note. The total score for Aural Discrimination = 70.

The independent sample *t*-test was conducted to analyse the differences between the score of musical creativity and gender. Initial analysis using the Levene's test of homogeneity of variances showed that there was no significant difference ($p > .05$) of the two groups (male and female) on the musical creativity scale. Hence, it can be assumed that the variances were homogenous (Kinnear & Gray, 2009) and the equal-variance *t*-test can be used.

As shown in Table 4.55, the mean of the musical creativity score for the male trainee teachers (M = 45.08, SD = 11.19) were significantly different from the female trainee teachers (M = 40.76, SD = 12.16); $t(157) = 2.14$; $p < .05$, the effect size was small .37. This means that the male trainee teachers are generally more creative musically than the female trainee teachers.

Table 4.55

Result of Independent Sample t-test for Differences between Gender and Musical Creativity

Gender	*M*	*SD*	*df*	*t*	*p*	*d*
Male	45.08	11.19	157	2.14	.03	.37
Female	40.76	12.16				

Note. *significant at $p < .05$,

A detailed analysis of each dimension and components in musical creativity is presented in Table 4.56.

In terms of musical fluency, the mean score for the male trainee teachers was 4.35 (*SD* = 1.53), and the mean score for the female trainee teachers was 4.02 (*SD* = 1.59). The data show that the mean score of the male trainee teachers outperformed the mean score of female trainee teachers in musical fluency.

In terms of musical originality, the mean score for the male trainee teachers was 4.29 (*SD* = 1.43), and the mean score for the female trainee teachers was 3.61 (*SD* = 1.67). The data show that the mean score of the male trainee teachers outperformed the mean score of female trainee teachers in musical originality.

In terms of musical originality, the mean score for the male trainee teachers was 4.02 (*SD* = 1.62), and the mean score for the female trainee teachers was 3.87 (*SD* = 1.81). The data show that the mean score of the male trainee teachers outperformed the mean score of female trainee teachers in musical elaboration.

As for musical resistance to premature closure, the mean score for the male trainee teachers was 3.98 (*SD* = 1.42), and the mean score for the female trainee teachers was 3.62 (*SD* = 1.54). The data show that the mean score of the male trainee teachers outperformed the mean score of female trainee teachers in musical resistance to premature closure.

Likewise, the mean score of musical abstractness of title for the male trainee teachers was 5.06 (*SD* = 0.93), and the mean score for the female trainee teachers was 4.53 (*SD* = 1.12). The data show that the mean score of the male trainee teachers outperformed the mean score of female trainee teachers in musical abstractness of title.

The above data indicate that in the creative dimension (musical fluency, musical originality, musical originality, musical resistance to premature closure, and musical abstractness of title) the male trainee teachers outperformed the female trainee teachers in all the components.

As for the technical goodness dimension, the mean score of craftsmanship of the male trainee teachers was 4.63 (*SD* = 1.50), and the mean score for the female trainee teachers was 4.05 (*SD* = 1.57). The data indicate that the mean score of the male trainee teachers outperformed the mean score of female trainee teachers in craftsmanship.

Likewise, the mean score of musical syntax for the male trainee teachers was 5.06 (*SD* = 0.93), and the mean score for the female trainee teachers was 4.53 (*SD* = 1.12). The data indicate that the mean score of the male trainee teachers outperformed the mean score of female trainee teachers in musical syntax.

The above data show that in terms of technical goodness (craftsmanship and musical syntax) the male trainee teachers outperformed the female trainee teachers in both of the components.

The aesthetic appeal dimension had only one component that was musical sensitivity. Data in Table 4.56 show that the mean score of musical sensitivity of the male trainee teachers was 4.20 (*SD* = 1.55), and the mean score for the female trainee teachers was 3.56 (*SD* = 1.73). The data indicate that the mean score of the male trainee teachers outperformed the mean score of female trainee teachers in musical sensitivity.

Table 4.56

Means and Standard Deviations for Components and Dimensions of Musical Creativity by Gender

Variables	Gender					
	Male (*n* = 51)		Female (*n* = 108)		Total Score (*n* = 159)	
	M	*SD*	*M*	*SD*	*M*	*SD*
MUSICAL CREATIVITY						
Creative Dimension						
Musical Fluency	**4.35**	1.53	4.02	1.59	4.13	1.58
Musical Originality	**4.29**	1.43	3.61	1.67	3.83	1.63
Musical Elaboration	**4.02**	1.62	3.87	1.81	3.92	1.75
Musical Resistance to Premature Closure	**3.98**	1.42	3.62	1.54	3.74	1.51
Musical Abstractness of Title	**5.06**	.925	4.53	1.12	4.70	1.09
Total Creative Dimension	21.35	5.79	19.39	6.60	20.02	6.40
Technical Goodness						
Craftsmanship	**4.63**	1.50	4.05	1.59	4.23	1.58
Musical Syntax	**4.53**	1.62	3.98	1.57	4.16	1.60
Total Technical Goodness	9.04	2.92	8.03	3.07	8.35	3.05
Aesthetic Appeal						
Musical Sensitivity	**4.20**	1.55	3.56	1.73	3.76	1.69
Repetition Of Song	5.90	.83	**6.02**	.82	5.98	.82

Note. The total score for Aural Discrimination = 70.

Repetition of song for the male trainee teachers was 5.90 (*SD* = 0.83), and the mean score for the female trainee teachers was 6.02 (*SD* = 0.82). Contrary to the above findings, the data for repetition of song show that the mean score of the female trainee teachers outperformed the mean score of male trainee teachers.

In summary, the mean scores of the male trainee teachers outperformed the mean of the scores of the female trainee teachers in eight out of nine components of musical creativity.

The independent sample *t*-test was conducted to analyse the differences between the score of the components in musical creativity with gender. Table 4.57 shows the summary of results.

Table 4.57

Summary of Independent Sample t-test for Differences between Gender and Components of Musical Creativity

Musical Creativity	Source	*M*	*SD*	*df*	*t*	*p*
Musical Fluency	Male Female	4.35 4.02	1.53 1.59	157	1.25	.21
Musical Originality	Male Female	4.29 3.61	1.43 1.67	157	2.51	.01*
Musical Elaboration	Male Female	4.02 3.87	1.62 1.81	157	.50	.62
Musical Resistance to Premature Closure	Male Female	3.98 3.62	1.42 1.54	157	1.41	.16
Musical Abstractness of Title	Male Female	5.06 4.53	.93 1.12	157	2.94	.00**
Craftsmanship	Male Female	4.63 4.05	1.50 1.58	157	2.20	.03*
Musical Syntax	Male Female	4.53 3.98	1.62 1.57	157	2.03	.04
Musical Sensitivity	Male Female	4.20 3.56	1.55 1.73	157	2.26	.03*
Repetition of Song	Male Female	5.90 6.02	.83 .82	157	-.83	.41

Note. *significant at $p < .05$, **significant at $p < .01$,

The data in Table 4.57 indicate that there were significant differences in the mean score of musical originality, musical abstractness of title, craftsmanship, musical syntax, and musical sensitivity between the male and female trainee teachers. The results suggest that the male trainee teachers and female trainee teachers have differences in five of the nine components in musical creativity.

It means that the male trainee teachers in this study are able to produce original ideas that is unique (musical originality), and produces a title that is able to capture the essence of the composition (musical abstractness of title) compare to the female trainee teachers. Besides that, the male trainee teachers have a higher mastery in tonal and metric cohesiveness (craftsmanship), compose melodies that makes musical sense (musical syntax), and their compositions is more expressive (musical sensitivity) than the compositions composed by the female trainee teachers.

4.9.2 The Relationship between Musical Creativity and Ethnicity

Table 4.58 presents the means and standard deviations of the musical creativity score according to ethnicity. It was found that the mean score of the Malay trainee teachers was 40.18 (*SD* = 11.95), the mean score of the Chinese trainee teachers was 44.96 (*SD* = 12.14), and the mean score of the trainee teachers of other ethnic was 39.78 (*SD* = 9.91).

Table 4.58

Means and Standard Deviations for Musical Creativity by Ethnicity

Variables	Ethnicity					
	Malay (n = 74)		Chinese (n = 67)		Other (n = 18)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Musical Creativity	40.18	11.95	44.96	12.14	39.78	9.91

Note. The total score for musical creativity = 70.

Data indicate that the Chinese trainee teachers had the highest mean score of musical creativity and the trainee teachers from other ethnic had the lowest mean score.

Table 4.59 presents the analysis of one-way ANOVA to determine whether ethnicity impacted musical creativity. The analysis show that there was a significant difference between musical creativity score and ethnicity $F(2, 156) = 3.28$, $p < .01$. This means that ethnicity had an influence on musical creativity.

Table 4.59

Summary of One-way ANOVA for Differences between Ethnicity and Musical Creativity

Source	Ethnicity	Sum of Squares	*df*	Mean Square	*F*	*p*
Musical Creativity Score	Between Groups	916.98	2	458.40	3.28	.04*
	Within Groups	21812.60	156	139.83		
	Total	22729.67	158			

Results of Tukey HSD test:

Musical Creativity	*(I) Ethnic*	*(J) Ethnic*	*Mean Difference (I-J)*	*Std. Error*	*p*
Musical Creativity	Malay	Chinese	-4.78*	1.99	.04*
		Others	.40	3.11	.99
	Chinese	Malay	4.78*	1.99	.04*
		Others	5.18	3.14	.22
	Others	Malay	-.40	3.11	.99
		Chinese	-5.18	3.14	.22

Note. *significant at $p < .05$,

Further analysis using the application of Tukey HSD revealed that the critical difference between the means for the Chinese trainee teachers and the Malay trainee teachers was 4.78, at the significance level of .05. It indicates that the Chinese trainee teachers scored significantly higher that the Malay trainee teachers on musical creativity (Mean: Chinese = 44.96, Malay = 40.18, $p < .05$).

Besides the musical creativity score, Table 4.60 shows the mean and standard deviations of each dimension and components of musical creativity.

Table 4.60

Means and Standard Deviations for Components of Musical Creativity by Ethnicity

Variables	Ethnicity					
	Malay (*n* = 74)		Chinese (*n* = 67)		Other (*n* = 18)	
	M	*SD*	*M*	*SD*	*M*	*SD*
MUSICAL CREATIVITY						
Creative Dimension						
Musical Fluency	3.91	1.55	4.55	1.59	3.44	1.25
Musical Originality	3.68	1.55	4.04	1.77	3.67	1.37
Musical Elaboration	3.47	1.64	4.55	1.77	3.39	1.38
Musical Resistance to Premature Closure	3.51	1.48	4.07	1.55	3.39	1.24
Musical Abstractness of Title	4.70	1.07	4.66	1.16	4.83	.92
Total Creative Dimension	19.03	6.15	21.46	6.75	18.72	5.20
Technical Goodness						
Craftsmanship	3.95	1.60	4.58	1.49	4.11	1.61
Musical Syntax	3.99	1.59	4.45	1.60	3.78	1.56
Total Technical Goodness	7.86	3.02	9.01	3.02	7.89	2.99
Aesthetic Appeal						
Musical Sensitivity	3.50	1.61	4.16	1.7	3.33	1.61
Repetition of Song	5.93	.87	5.94	.76	6.33	.84

Note. The total score for musical creativity = 70.

For the creative dimension, results reported that the Chinese trainee teachers had a higher mean score in musical fluency (*M* = 4.55, *SD* = 1.59), musical originality (*M* = 4.04, *SD* = 1.77), musical elaboration (*M* = 4.55, *SD* = 1.77), and musical resistance to premature closure (*M* = 4.07, *SD* = 1.55) compared to the trainee teachers of other ethnicity. They had the highest score in the creative dimension (*M* = 21.46, *SD* = 6.75). However, the trainee teachers from other ethnic scored higher than the Chinese trainee teachers in the component of musical abstractness of title (*M* = 4.83, *SD* = 0.92).

This indicates that the Chinese trainee teachers had higher mean scores than the Malay trainee teachers and the trainee teachers from other ethnic in four out of five components in creative dimension. The trainee teachers from other ethnic groups had higher mean scores than the Chinese trainee teachers and the Malay trainee teachers in one out of five components in creative dimension.

As for the dimension of technical goodness, the Chinese trainee teachers scored the highest in craftsmanship (*M* = 4.58, *SD* = 1.49), musical syntax (*M* = 4.55, *SD* = 1.60), and technical goodness (*M* = 9.01, *SD* = 3.02). Results indicate that the Chinese trainee teacher outperformed the Malay trainee teachers and the trainee teachers from other ethnic groups in all components of technical goodness.

Likewise, the Chinese trainee teachers also scored the highest in musical sensitivity (*M* = 4.16, *SD* = 1.74). However, the trainee teachers from other ethnic groups had the highest mean score in repetition of songs (*M* = 6.33, *SD* = .84).

This reveals that the mean score of the Chinese trainee teachers out-performed the mean score of the other ethnicity in seven out of nine components of musical creativity. However, the Chinese trainee teachers did not out-perform the other ethnicity in musical abstractness of title and repetition of song. This means that though the Chinese trainee teachers are more musically creative, they are not as creative as the others is producing abstract ideas (musical abstractness of title) and are less accurate in repeating composition (repetition of song).

To determine whether there were significant differences between ethnicity on musical creativity, their mean scores were compared using one-way ANOVA and later followed by Tukey HSD test. Table 4.61 presents the results summary of the one-way ANOVA and Appendix E presents the results of the Tukey HSD test. The results of analyss of variance indicate that of the nine components of musical creativity, five yield significant differences. The components were musical fluency, musical elaboration, musical resistance to premature closure, craftsmanship, and musical sensitivity.

Table 4.61

Summary of One-way ANOVA for Differences between Ethnicity and Components of Musical Creativity

Source	Ethnicity	Sum of Squares	*df*	Mean Square	*F*	*p*
Musical Fluency	Between Groups	24.13	2	12.06	5.09	.01**
	Within Groups	369.34	156	2.36		
	Total	393.48	158			
Musical Originality	Between Groups	5.33	2	2.66	1.00	.36
	Within Groups	413.08	156	2.64		
	Total	418.41	158			
Musical Elaboration	Between Groups	46.64	2	23.32	8.35	.00***
	Within Groups	435.29	156	2.79		
	Total	481.93	158			
Musical Resist to Premature Closure	Between Groups	13.51	2	6.75	3.05	.05*
	Within Groups	345.39	156	2.21		
	Total	358.90	158			
Musical Abstractness of Title	Between Groups	.44	2	.22	.18	.83
	Within Groups	187.06	156	1.19		
	Total	187.50	158			
Craftsmanship	Between Groups	14.53	2	7.26	2.99	.05*
	Within Groups	377.86	156	2.42		
	Total	392.39	158			
Musical Syntax	Between Groups	10.40	2	5.20	2.05	.13
	Within Groups	394.66	156	2.53		
	Total	405.06	158			
Musical Sensitivity	Between Groups	19.22	2	9.61	3.45	.03*
	Within Groups	433.69	156	2.78		
	Total	452.91	158			
Repetition of Song	Between Groups	2.52	2	1.26	1.88	.15
	Within Groups	104.42	156	.66		
	Total	106.94	158			

Note. *significant at $p < .05$, **significant at $p < .01$, ***significant at $p < .001$

In terms of musical fluency, the results of analysis of variance indicate that there were significant differences in the musical fluency scores, F (2, 156) = 5.10, $p < .05$. Application of Tukey HSD revealed that the critical difference between the means for the Chinese trainee teachers and the Malay trainee teachers was .64, at the significance level of .05. It shows that the Chinese trainee teachers scored significantly higher that the Malay trainee teachers on musical fluency. Results also indicate that the critical difference between the means for the Chinese trainee teachers and the trainee teachers from other ethnic was 1.10, at the significance level of .05. It shows that the Chinese trainee teachers scored significantly higher that the trainee teachers from other ethnic groups on musical fluency.

In terms of musical elaboration, the results of analysis of variance show that there were significant differences in the musical elaboration scores, $F(2, 156) = 8.36$, $p < .05$. Application of Tukey HSD revealed that the critical difference between the means for the Chinese trainee teachers and the Malay trainee teachers was 1.07, at the significance level of .05.

The results show that the Chinese trainee teachers scored significantly higher that the Malay trainee teachers on musical elaboration. Results also indicate that the critical difference between the means for the Chinese trainee teachers and the trainee teachers from other ethnic was 1.16, at the significance level of .05. It shows that the Chinese trainee teachers scored significantly higher that the trainee teachers from other ethnic groups on musical elaboration.

In terms of craftsmanship, the results of analysis of variance show that there was a significant difference in the craftsmanship scores, $F(2, 156) = 3.00$, $p < .05$. Application of Tukey HSD revealed that the critical difference between the means for the Chinese trainee teachers and the Malay trainee teachers was .64, at the significance level of .05. It indicates that the Chinese trainee teachers scored significantly higher that the Malay trainee teachers on craftsmanship.

In terms of musical resistance to premature closure, the data in the Tukey HSD test did not show significant difference between groups of ethnicity. Hence, it is concluded that ethnicity has no influence over musical resistance to premature closure.

Similarly, in terms of musical sensitivity, the data in the Tukey HSD test did not show significant difference between groups in ethnicity.

With that, the results of analysis of variance show no significant difference in the musical originality scores, $F(2, 156) = 1.01$, $p > .05$. Subsequently, the results of analysis of variance also show no significant difference in the musical abstractness of title score $F(2, 156) = 0.19$, $p > .05$, musical syntax score $F(2, 156) = 2.06$, $p > .05$, and the repetition of song score $F(2, 156) = 1.88$, $p > .05$. From the results of Tukey HSD, results indicate that of the nine components of musical creativity, three yield significant differences. The components were musical fluency, musical elaboration, and craftsmanship.

The results of ANOVA analysis between the three ethnic groups on musical creativity and its components can be summarised as follows:

1. The Chinese trainee teachers scored significantly higher than the Malay trainee teachers on musical fluency, musical elaboration, and craftsmanship. This means that the Chinese trainee teachers are significantly more creative than the Malay trainee teachers in three out of nine components of musical creativity.
2. The Chinese trainee teachers scored significantly higher than the trainee teachers from the other ethnic groups on musical fluency and musical elaboration. This means that the Chinese trainee teachers are significantly more creative than the trainee teachers from the other ethnic groups on two of the nine components of musical creativity.
3. The Chinese trainee teachers scored significantly higher than the Malay trainee teachers on musical creativity. This means that the Chinese trainee teachers are significantly more creative in musical creativity than the Malay trainee teachers.

4.9.3 The Relationship between Musical Creativity and Academic Years

Table 4.62 presents the means and standard deviations of the total score of musical creativity according to academic years. The mean scores of the total score of musical creativity for trainee teachers in year one was 42.35 (*SD* = 13.34), in year two was 44.48 (*SD* = 12.05), in year three was 44.36 (*SD* = 11.26), and year four was 39.37 (*SD* = 11.68).

Table 4.62

Means and Standard Deviations for Musical Creativity by Academic Years

Variables	Academic Years							
	Year 1		Year 2		Year 3		Year 4	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Musical Creativity	42.35	13.34	44.48	12.05	44.36	11.26	39.37	11.68

Note. The total score for Aural Discrimination = 70.

From the mean value of musical creativity, it was found that the trainee teacher in year two had higher mean scores than the trainee teachers from other years in musical creativity. The trainee teachers in year three had the lowest musical creativity score.

Further analysis using the one-way ANOVA test to confirm the influence of academic years on the trainee teachers' musical creativity is shown in Table 4.63.

The data indicate that there was no significant difference between academic years and total score of musical creativity $F(3, 155) = 2.02$, $p > .01$. A further analysis with Tukey HSD also reported no significant difference in musical creativity score between academic years. This means that the trainee teachers' musical creativity is independent of their academic years.

Table 4.63

Summary of One-way ANOVA for Differences between Academic Years and Musical Creativity

Source	Academic Years	*Sum of Squares*	*df*	*Mean Square*	*F*	*p*
Musical Creativity	Between Groups	856.43	3	285.48	2.02	.11
	Within Groups	21873.24	155	141.12		
	Total	22729.67	158			

Results of Tukey HSD test:

Musical Creativity	*(I) Year*	*(J) Year*	*Mean Difference (I-J)*	*Std. Error*	*p*
Musical Creativity	Year 1	Year 2	-2.13	3.31	.91
		Year 3	-2.00	3.04	.91
		Year 4	2.97	2.90	.73
	Year 2	Year 1	2.13	3.31	.91
		Year 3	.12	2.82	1.00
		Year 4	5.11	2.67	.22
	Year 3	Year 1	2.00	3.04	.91
		Year 2	-.12	2.82	1.00
		Year 4	4.98	2.32	.14
	Year 4	Year 1	-2.97	2.90	.73
		Year 2	-5.11	2.67	.22
		Year 3	-4.98	2.32	.14

A detailed analysis of means and standard deviations of the components of musical creativity is shown in Table 4.64. The data are discussed according to the dimensions in musical creativity.

First, a comparison of the mean score of the components in creative dimension in musical creativity is discussed.

In terms of musical fluency, the mean score of the year one trainee teachers was 4.26 (*SD* = 1.74), the mean score for the year two trainee teachers was 4.45 (*SD* = 1.66), the mean score for the year three trainee teachers was 4.31 (*SD* = 1.53), and the mean score for the year four trainee teachers was 3.79 (*SD* = 1.49). This means that the year two trainee teachers achieved higher mean score on musical fluency compared to the trainee teachers from year one, year three and year four.

Table 4.64

Means and Standard Deviations for Components of Musical Creativity by Year

Variables	Academic Years							
	Year 1		Year 2		Year 3		Year 4	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
MUSICAL CREATIVITY								
Creative Dimension								
Musical Fluency	4.26	1.74	4.45	1.66	4.31	1.53	3.79	1.49
Musical Originality	3.57	1.65	4.07	1.60	4.20	1.59	3.55	1.63
Musical Elaboration	3.70	1.94	4.31	1.89	3.89	1.56	3.84	1.75
Musical Resistance to Premature Closure	3.96	1.75	4.07	1.36	3.93	1.47	3.35	1.46
Musical Abstractness of Title	4.48	1.31	4.59	1.27	4.82	0.86	4.74	1.07
Total Creative Dimension	19.96	7.18	21.48	6.79	20.33	6.00	19.13	6.20
Technical Goodness								
Craftsmanship	4.70	1.69	4.72	1.44	4.53	1.42	3.61	1.53
Musical Syntax	4.26	1.74	4.45	1.66	4.51	1.50	3.73	1.53
Total Technical Goodness	8.96	3.35	9.17	3.01	9.04	2.78	7.24	2.87
Aesthetic Appeal								
Musical Sensitivity	3.74	1.55	3.90	1.93	4.13	1.65	3.44	1.64
Repetition of Song	5.96	0.88	6.00	0.76	6.07	0.75	5.92	0.89

Note. The total score for Aural Discrimination = 70.

In terms of musical originality, the mean score of the year one trainee teachers was 3.57 (*SD* = 1.65), the mean score for the year two trainee teachers was 4.07 (*SD* = 1.60), the mean score for the year three trainee teachers was 4.20 (*SD* = 1.59), and the mean score for the year four trainee teachers was 3.55 (*SD* = 1.63). This means that the year three trainee teachers achieved higher means score on musical originality compared to the trainee teachers from year one, year two and year four.

In terms of musical elaboration, the mean score of the year one trainee teachers was 3.70 (*SD* = 1.94), the mean score for the year two trainee teachers was 4.31 (*SD* = 1.89), the mean score for the year three trainee teachers was 3.89 (*SD* = 1.56), and the mean score for the year four trainee teachers was 3.84 (*SD* = 1.75). This means that the year two trainee teachers achieved higher mean scores on musical elaboration compared to the trainee teachers from year one, year three and year four.

In terms of musical resistance to premature closure, the mean score of the year one trainee teachers was 3.96 (*SD* = 1.75), the mean score for the year two trainee teachers was 4.07 (*SD* = 1.36), the mean score for the year three trainee teachers was 3.93 (*SD* = 1.47), and the mean score for the year four trainee teachers was 3.35 (*SD* = 1.46). This means that the year two trainee teachers achieved higher mean scores on musical resistance to premature closure compared to the trainee teachers from year one, year three and year four.

In terms of musical abstractness of title, the mean score of the year one trainee teachers was 4.48 (*SD* = 1.31), the mean score for the year two trainee teachers was 4.59 (*SD* = 1.27), the mean score for the year three trainee teachers was 4.82 (*SD* = .86), and the mean score for the year four trainee teachers was 4.74 (*SD* = 1.07). This means that the year three trainee teachers achieved higher mean scores on musical abstractness of title compared to the trainee teachers from year one, year two and year four.

The results indicate that the year two trainee teachers outperformed the other trainee teachers in three of the five components in the creative dimension of musical creativity. The other two dimensions were scored higher by the trainee teachers in year three.

Second, a comparison of the mean score of the components in technical goodness is discussed. The means and standard deviations of components of technical goodness are shown in Table 4.64.

The mean score for craftsmanship of the year one trainee teachers was 4.70 (*SD* = 1.69), the mean score for the year two trainee teacher was 4.72 (*SD* = 1.44), the mean score for the year three trainee teacher was 4.53 (*SD* = 1.42), and the mean score for the year four trainee teacher was 3.61 (*SD* = 1.53). This means that the year two trainee teachers achieved higher mean scores on craftsmanship compared to the trainee teachers from year one, year three, and year four.

Data also show that the mean score for musical syntax of the year one trainee teachers was 4.26 (*SD* = 1.74), the mean score for the year two trainee teacher was 4.45 (*SD* = 1.66), the mean score for the year three trainee teacher was 4.51 (*SD* = 1.50), and the mean score for the year four trainee teacher was 3.73 (*SD* = 1.53). This means that the year three trainee teachers achieved higher mean scores on musical syntax compared to the trainee teachers from year one, year two and year four.

Results showe that the year two trainee teachers outperformed the other trainee teachers in the mean score of craftsmanship. Results also show that the year three trainee teachers outperformed the other trainee teachers in the mean score of musical syntax. However, the mean of the total technical goodness score show that the trainee teachers in year two outperformed the other trainee teachers.

The third dimension in musical creativity is aesthetic appeal. Table 4.64 shows the mean and standard deviation of aesthetic appeal. The mean score for musical sensitivity of the year one trainee teachers was 3.74 (*SD* = 1.55), the mean score for the year two trainee teacher was 3.90 (*SD* = 1.93), the mean score for the year three trainee teacher was 4.13 (*SD* = 1.65), and the mean score for the year four trainee teacher was 3.44 (*SD* = 1.64). Results indicate that year three trainee teachers achieved higher mean scores on musical sensitivity compared to the trainee teachers from year one, year two, and year four.

Last of all, the mean and standard deviation of repetition of song is presented in Table 4.64. The mean score for repetition of song of the year one trainee teachers was 5.96 (*SD* = .88), the mean score for the year two trainee teacher was 6.00 (*SD* = .76), the mean score for the year three trainee teacher was 6.07 (*SD* = .75), and the mean score for the year four trainee teacher was 5.92 (*SD* = .89). Results indicate that year three trainee teachers achieved higher mean scores on repetition of song compared to the trainee teachers from year one, year two, and year four.

In summary, the year two trainee teachers outperformed the other trainee teachers in four of the nine components in musical creativity, and the year three trainee teachers outperformed the other trainee teachers in five of the nine components in musical creativity.

It is interesting to note that the trainee teachers in year four had the lowest score in creative dimension and technical goodness. They also had the lowest mean score for musical creativity. The trainee teachers in year two had the highest score in musical creativity follow by the trainee teachers in year three, and the trainee teachers in year one. From the results in Table 4.64, it is found that there was no gradual improvement of musical creativity according to the number of years of studies.

Table 4.65 presents the results of one-way ANOVA and Tukey HSD test. One-way ANOVA and Tukey HSD test were performed on the musical creativity and academic years to determine whether there are significant differences among academic years on the components of musical creativity. The results of the analyses of variance indicate that of the nine components of musical creativity, two yield significant differences. However, a detail analysis using the Tukey HSD test revealed that there was a significant difference between academic years and craftsmanship. Henceforth, eight of the nine components in musical creativity have no significant difference in their mean score on academic years.

Table 4.65

Summary of One-way ANOVA for Differences between Academic Years and Components of Musical Creativity

Source	Academic Years	*Sum of Squares*	*df*	*Mean Square*	*F*	*p*
Musical Fluency	Between Groups	11.96	3	3.99	1.62	.18
	Within Groups	381.53	155	2.46		
	Total	393.48	158			
Musical Originality	Between Groups	14.35	3	4.78	1.83	.14
	Within Groups	404.07	155	2.61		
	Total	418.42	158			
Musical Elaboration	Between Groups	6.03	3	2.01	.66	.58
	Within Groups	475.91	155	3.07		
	Total	481.94	158			
Musical Resist to Premature Closure	Between Groups	15.09	3	5.03	2.27	.08
	Within Groups	343.81	155	2.22		
	Total	358.91	158			
Musical Abstractness of Title	Between Groups	2.29	3	.76	.64	.59
	Within Groups	185.22	155	1.19		
	Total	187.51	158			
Craftsmanship	Between Groups	39.82	3	13.27	.64	.00**
	Within Groups	352.57	155	2.28		
	Total	392.39	158			
Musical Syntax	Between Groups	19.88	3	6.63	2.67	.05*
	Within Groups	385.19	155	2.49		
	Total	405.07	158			
Musical Sensitivity	Between Groups	13.35	3	4.45	1.57	.19
	Within Groups	439.57	155	2.84		
	Total	452.92	158			
Repetition of Song	Between Groups	.59	3	.200	.29	.83
	Within Groups	106.35	155	.69		
	Total	106.94	158			

Note. *significant at $p < .05$, **significant at $p < .01$,

The results of one-way analysis of variance on component of musical creativity found that there was a significant difference in craftsmanship $F(3, 155) = .66$, $p < .05$. Application of Tukey HSD revealed that there was a significant difference in craftsmanship between the trainee teachers in year one and trainee teacher in year four (Mean: Year one = 4.70, Year four = 3.61, p < .01). Data also show that the critical difference between the means of the year one trainee teachers and the year four trainee teachers was 1.083, at the significance level of .05. It indicates that the trainee teachers in year one outperformed the trainee teachers in year four in craftsmanship.

The results of Tukey HSD also revealed significant differences in craftsmanship between the trainee teachers in year two and trainee teacher in year four (Mean: Year one = 4.72, Year four = 3.61, $p < .01$). The data show that the critical difference between the means of the year one trainee teachers and the year four trainee teachers was 1.11 at the significance level of .05. It indicates that the trainee teachers in year two outperformed the trainee teachers in year four in craftsmanship.

Likewise, the results of Tukey HSD also reported that there was a significant difference in craftsmanship between the trainee teachers in year three and trainee teacher in year four (Mean: Year one = 4.53, Year four = 3.61, $p < .01$).

The data show that the critical difference between the means of the year one trainee teachers and the year four trainee teachers was .92, at the significance level of .05. It indicates that the trainee teachers in year three outperformed the trainee teachers in year four in craftsmanship.

The above results indicate that the trainee teachers in year one, year two, and year three outperformed the trainee teachers in year four in craftsmanship. Since there was no significant difference found in the other components of musical creativity, it suggests that eight of the nine components of musical creativity were independent of academic years.

4.9.4 The Relationship between Musical Creativity and Socioeconomic Status

The mean and standard deviation scores of musical creativity according to high and low socioeconomic status of the trainee teachers are shown in Table 4.66. Results show that the trainee teachers from the high socioeconomic status had a mean score of 43.89 (*SD* = 12.19) and the low socioeconomic status had a mean score of 41.46 (*SD* = 11.90). Data indicate that the high socioeconomic status trainee teachers had a higher overall mean score than the low socioeconomic status trainee teachers.

Table 4.66

Means and Standard Deviations for Musical Creativity by Socioeconomic Status

Variables	Socioeconomic Status			
	High SES (n = 45)		Low SES (n = 114)	
	M	*SD*	*M*	*SD*
Musical Creativity	43.89	12.19	41.46	11.90

Note. The total score for Aural Discrimination = 70.

To determine whether there is a significant difference between high and low SES in musical creativity, analysis using independent sample *t*-test was conducted. The data are shown in Table 4.67. The results of the analysis show that there was no significant difference in the mean score of musical creativity on socioeconomic status. The trainee teachers' socioeconomic status did not influence their musical creativity.

The means and standard deviations of the dimensions and components of musical creativity are presented in Table 4.68. Results indicate that the trainee teachers from the high socioeconomic status had a higher mean score in all of the five components in creative dimension.

Table 4.67

Result of Independent Sample t-test for Differences between Socioeconomic Status and Musical Creativity

Socioeconomic Status	*M*	*SD*	*df*	*t*	*p*	*d*
Low SES	41.46	11.90	157	1.15	.25	.20
High SES	43.89	12.19				

Note. *The mean difference is significant at the .05 level.

In terms of musical fluency, the mean score of the high socioeconomic status trainee teachers was 4.58 (*SD* = 1.53), and the mean score for the low socioeconomic status trainee teachers was 3.95 (*SD* = 1.57). This means that higher socioeconomic status trainee teachers achieved higher mean scores on musical fluency compared to the low socioeconomic status trainee teachers.

In terms of musical originality, the mean score of the high socioeconomic status trainee teachers was 4.13 (*SD* = 1.65), and the mean score for the low socioeconomic status trainee teachers was 3.71 (*SD* = 1.61). This means that high socioeconomic status trainee teachers achieved higher mean scores on musical originality compared to the low socioeconomic status trainee teachers.

In addition, the mean score of musical elaboration of the high socioeconomic status trainee teachers was 4.11 (*SD* = 1.79), and the mean score for the low socioeconomic status trainee teachers was 3.84 (*SD* = 1.73). This means that the high socioeconomic status trainee teachers achieved higher mean scores on musical elaboration compared to the low socioeconomic status trainee teachers. In terms of musical resistance to premature closure, the mean score of the high socioeconomic status trainee teachers was 4.01 (*SD* = 1.41), and the mean score for the low socioeconomic status trainee teachers was 3.62 (*SD* = 1.54). This means that the high socioeconomic status trainee teachers achieved higher mean scores on musical resistance to premature closure compared to the low socioeconomic status trainee teachers.

Besides that, the mean score of musical abstractness of title for the high socioeconomic status trainee teachers was 4.71 (*SD* = 1.25), and the mean score for the low socioeconomic status trainee teachers was 4.69 (*SD* = 1.02). This means that the high socioeconomic status trainee teachers achieved higher mean scores on musical abstractness of title compared to the low socioeconomic status trainee teachers.

Results indicate that the high socioeconomic status trainee teachers scored higher than the low socioeconomic status trainee teachers in all of the five components of creative dimension. The mean score of the creative dimension score indicates that the high socioeconomic status scored higher than the low socioeconomic status.

Table 4.68

Means and Standard Deviations for Components of Musical Creativity by Socioeconomic Status

Variables	Socioeconomic Status			
	High SES (n = 45)		Low SES (n = 114)	
	M	*SD*	*M*	*SD*
MUSICAL CREATIVITY				
Creative Dimension				
Musical Fluency	**4.58**	1.53	3.95	1.57
Musical Originality	**4.13**	1.65	3.71	1.61
Musical Elaboration	**4.11**	1.79	3.84	1.73
Musical Resistance to Premature Closure	**4.02**	1.41	3.62	1.54
Musical Abstractness of Title	**4.71**	1.25	4.69	1.02
Total Creative Dimension	21.53	6.36	19.42	6.34
Technical Goodness				
Craftsmanship		1.71	4.18	1.52
Musical Syntax		1.67	4.05	1.57
Total Technical Goodness	8.78	3.27	8.18	2.96
Aesthetic Appeal				
Musical Sensitivity	**3.91**	1.82	3.70	1.65
Repetition of Song	5.73	.99	**6.08**	.73

Note. The total score for Aural Discrimination = 70.

As for the technical goodness dimension, the mean and standard deviations are shown in Table 4.68. The mean score for craftsmanship of the high socioeconomic status was 4.38 (*SD* = 1.71), and the mean score for the low socioeconomic status was 4.18 (*SD* = 1.52). The mean score for musical syntax of the high socioeconomic status was 4.42 (*SD* = 1. 67), and the mean score for the low socioeconomic status was 4.05 (*SD* = 1.57).

Results show that the mean scores of the high socioeconomic status of all the components in technical goodness that were craftsmanship and musical syntax were scored higher by the high socioeconomic status trainee teachers. In addition, the mean score of technical goodness presented in Table 4.68 shows that the high socioeconomic status trainee teachers scored higher than the low socioeconomic status trainee teachers.

For the aesthetic appeal dimension, the mean score of musical sensitivity for the high socioeconomic status was 3.91, (*SD* = 1.82), and the mean score for the low socioeconomic status was 3.70 (*SD* = 1.65). Similar to the technical goodness, the high socioeconomic status trainee teachers scored higher in musical sensitivity than the low socioeconomic status trainee teachers.

However, the mean score for repetition of song shows otherwise. The mean score of the high socioeconomic status for repetition of song was 5.73 (*SD* = .99), and the mean score for the low socioeconomic status was 6.08 (*SD* = .73). The low socioeconomic status trainee teachers had a higher mean score than the high socioeconomic status trainee teachers in repetition of song. In summary, the high socioeconomic status trainee teachers outperformed the low socioeconomic status trainee teachers in eight out of nine components in musical creativity.

The independent sample *t*-test was conducted to analyse the differences between the score of the components in musical creativity with socioeconomic status. Table 4.69 shows the summary of results. Though there was no significant difference in the musical creativity score, *t*-test analysis of every component of musical creativity revealed that there were significant differences in musical fluency and repetition of song between the high and low socioeconomic status trainee teachers.

Table 4.69

Summary of Independent Sample t-test for Differences between Socioeconomic Statuses and Components of Musical Creativity

Musical Creativity	Source	*M*	*SD*	*df*	*t*	*p*	*d*
Musical Fluency	Low SES High SES	3.95 4.58	1.57 1.53	157	-2.30	.02*	.41
Musical Originality	Low SES High SES	3.71 4.13	1.61 1.65	157	-1.48	.14	.26
Musical Elaboration	Low SES High SES	3.84 4.11	1.73 1.79	157	-0.87	.38	.15
Musical Resistance to Premature Closure	Low SES High SES	3.62 4.02	1.54 1.41	157	-1.51	.13	.27
Musical Abstractness of Title	Low SES High SES	4.69 4.71	1.02 1.25	157	-0.09	.93	.02
Craftsmanship	Low SES High SES	4.18 4.38	1.52 1.71	157	-0.73	.47	.12
Musical Syntax	Low SES High SES	4.05 4.42	1.57 1.67	157	-1.31	.19	.23
Musical Sensitivity	Low SES High SES	3.70 3.91	1.65 1.82	157	-0.70	.48	.12
Repetition of Song	Low SES High SES	6.08 5.73	.73 .99	157	2.42	.02*	.40

Note. *significant at $p < .05$,

Data indicate that in terms of musical fluency, the high socioeconomic status trainee teachers outperformed the low socioeconomic status (Mean: High socioeconomic status = 4.58, Low socioeconomic status = 3.95). This difference was significant, $t(157) = -2.30$, $p < .05$, with a small effect size of .41. This means that the high socioeconomic status trainee teachers are able to produce fluent ideas and move from one musical idea to another at ease (musical fluency) compared to high socioeconomic status trainee teachers.

Data also indicate that in terms of repetition of song, the low socioeconomic status trainee teachers outperformed the high socioeconomic status (Mean: Low socioeconomic status = 6.08, High socioeconomic status = 5.73, $p < .05$). This difference was significant $t(157) = 2.42$, $p < .05$, with a small effect size of .40. This means that the low socioeconomic status trainee teachers are able to play the second paying of the composition more accurately (repetition of song) than the socioeconomic status trainee teachers. However, only two of the nine components of musical creativity are influenced by socioeconomic status.

4.9.5 Summary of Results for Research Question Eight

1. It was found that there were significant differences in musical creativity among gender and ethnicity. This means that the trainee teachers had differences in musical creativity in term of gender and ethnicity. The male trainee teachers are significantly more creative in musical creativity than the female trainee teachers. The Chinese trainee teachers are significantly more creative in musical creativity than the Malay trainee teachers.

2. It was found that there was no significant difference in musical creativity among academic years and socioeconomic status. This means that the trainee teachers had equal ability in musical creativity in terms of academic years and socioeconomic status. The academic years in the institutions and the socioeconomic status of the family did not influence musical creativity.

However, a detailed analysis revealed that even though the results show no significant difference between musical creativity and academic year, a detailed analysis revealed that year one trainee teachers outperformed year four trainee teachers in craftsmanship. Similarly, the year three trainee teachers and year two trainee teachers also outperformed year four trainee teachers in craftsmanship.

Likewise, even though the results show no significant difference between musical creativity and socioeconomic status, a detailed analysis revealed that there are significant differences in musical fluency and repetition of songs between the high and low socioeconomic status trainee teachers. The high socioeconomic status trainee teachers had higher musical fluency than the low socioeconomic status trainee teachers. On the contrary, the low socioeconomic status trainee teachers had a higher repetition of song than the high socioeconomic status trainee teachers.

4.10 Data Analysis of Research Question Nine

Are there any significant relationships between general creativity and personal variables among the trainee teachers?

Research question nine investigated the relationships between general creativity and personal variables such as gender, ethnicity, academic years, and socioeconomic status. The mean and standard deviation scores of general creativity were presented. The significant differences in mean scores between general creativity and variables such as gender, ethnicity, academic years, and socioeconomic status were analysed using independent sample *t*-test and one-way ANOVA. Tukey HSD was also employed to determine which group of the variables had significant differences in the analysis. The level of significance was set at $p < .05$ for all statistical tests.

4.10.1 The Relationship between General Creativity and Gender

Table 4.70 displays the means and standard deviations of general creativity. First, the results of the sum of standard score of general creativity which was the composite score of all the five components of general creativity showed that the male trainee teachers had a mean score of 519.65, and the standard deviation was 43.64. The female trainee teachers had a mean score of 505.13, and the standard deviation was 50.82. From the results, the male trainee teacher had a higher mean score in sum of standard score of general creativity compared to the female trainee teachers.

Next, the creative index showed that the male trainee teachers had a mean score of 113.34, and the standard deviation was 10.09. The female trainee teachers had a mean score of 110.39, and the standard deviation was 11.60. From the results, the male trainee teacher had a higher mean score in creative index compared to the female trainee teachers.

The results above suggest that the in term of mean score, the male trainee teachers outperformed the female trainee teachers in the sum of standard score and creative index of general creativity.

Table 4.70

Means and Standard Deviations for General Creativity by Gender

Variables	Gender			
	Male (n = 51)		Female (n = 108)	
	M	*SD*	*M*	*SD*
General Creativity				
Sum of Score	519.65	43.64	505.13	50.82
Creative Index	113.34	10.09	110.39	11.60

Independent sample *t*-test was conducted to analyse the differences between the sum of standard score and creative index of general creativity with gender. Table 4.71 shows the summary of the results of the analysis.

The Levene's test of homogeneity of variances shown in the *t*-test results was not significant ($p > .05$) for the two groups (male and female) on the sum of standard score and creative index of general creativity scale. Hence, it can be assumed that the variances were homogenous (Kinnear & Gray, 2009) and the equal-variance *t*-test can be used.

For the sum of standard score of general creativity, the mean of the male (M = 519.65, SD = 43.64) were not significantly different from the female (M = 505.13, SD = 50.82); $t(157) = 1.76$; $p > .05$. The data indicate that there was no difference in sum of standard score of general creativity between the male trainee teachers and the female trainee teachers.

From the creative index, the mean of the male (*M* = 113.34, *SD* = 10.09) were not significantly different from the female (*M* = 110.39, *SD* = 11.60); $t(157) = 1.56$; $p > .05$. The data indicate that there was no difference in the creative index of general creativity between the male trainee teachers and the female trainee teachers.

Table 4.71

Result of Independent Sample t-test for Differences between Gender and General Creativity

General Creativity	Source	*M*	*SD*	*df*	*t*	*p*	*d*
Sum of Scores	Male	519.65	43.64	157	1.76	.08	.31
	Female	505.13	50.82				
Creative Index	Male	113.34	10.09	157	1.56	.12	.27
	Female	110.39	11.60				

Table 4.72 displays the means and standard deviations of the components of general creativity with gender.

In terms of figural fluency, the mean score for the male trainee teachers was 105.73 (*SD* = 11.82), and the mean score for the female trainee teachers was 106.01 (*SD* = 12.03). The data suggest that the mean score of the female trainee teachers outperformed the mean score of male trainee teachers in figural fluency.

In terms of figural originality, the mean score for the male trainee teachers was 106.69 (*SD* = 13.54), and the mean score for the female trainee teachers was 103.56 (*SD* = 12.67). The data suggest that the mean score of the male trainee teachers outperformed the mean score of female trainee teachers in figural originality.

In terms of figural elaboration, the mean score for the male trainee teachers was 98.61 (*SD* = 16.94), and the mean score for the female trainee teachers was 97.44 (*SD* = 15.52). The data suggest that the mean score of the male trainee teachers outperformed the mean score of female trainee teachers in figural elaboration.

Table 4.72

Means and Standard Deviations for Components of General Creativity by Gender

Variables	Gender			
	Male (*n* = 51)		Female (*n* = 108)	
	M	*SD*	*M*	*SD*
General Creativity				
Figural Fluency	105.73	11.82	**106.01**	12.03
Figural Originality	**106.69**	13.54	103.56	12.67
Figural Elaboration	**98.61**	16.94	97.44	15.52
Figural Resistance to Premature Closure	**109.94**	14.85	105.27	17.18
Figural Abstractness of Title	**98.69**	22.33	92.87	20.58

As for figural resistance to premature closure, the mean score for the male trainee teachers was 109.94 (*SD* = 14.85), and the mean score for the female trainee teachers was 105.27 (*SD* = 17.18). The data suggest that the mean score of the male trainee teachers outperformed the mean score of female trainee teachers in figural resistance to premature closure.

Likewise, the mean score of figural abstractness of title for the male trainee teachers was 98.69 (*SD* = 22.33), and the mean score for the female trainee teachers was 92.87 (*SD* = 20.58). The data suggest that the mean score of the male trainee teachers outperformed the mean score of female trainee teachers in figural abstractness of title.

The above data indicate that in terms of general creativity the male trainee teachers had a higher mean score than the female trainee teachers in four of the five components of general creativity.

The independent sample *t*-test was conducted to analyse the differences between the score of the components in general creativity with gender. Table 4.73 shows the summary of results.

Table 4.73

Summary of Independent Sample t-test for Differences between Gender and Components of General Creativity

	Source	*M*	*SD*	*df*	*t*	*p*	*d*
Figural Fluency	Male	105.73	11.82	157	-.14	.89	.02
	Female	106.01	12.03				
Figural Originality	Male	106.69	13.54	157	1.42	.16	.24
	Female	103.56	12.67				
Figural Elaboration	Male	98.61	16.94	157	.43	.67	.07
	Female	97.44	15.52				
Figural Resistance to Premature Closure	Male	109.94	14.85	157	1.67	.10	.29
	Female	105.27	17.18				
Figural Abstractness of Title	Male	98.69	22.33	157	1.62	.11	.27
	Female	92.87	20.58				

Data in Table 4.73 show no significant differences in the mean score of components in general creativity with gender. The data indicate that general creativity and all its five components were independent of gender. It means that there is no difference between male and female trainee teachers in figural fluency, figural originality, figural elaboration, figural resistance to premature closure, and figural abstractness of title.

4.10.2 The Relationship between General Creativity and Ethnicity

The mean and standard deviation of general creativity according to ethnicity is shown in Table 4.74.

The mean score of sum of standard score of the Malay trainee teachers was 516.84, and the standard deviation was 46.19. The mean score for the creativity index of the Chinese trainee teachers was 504.37, and the standard deviation was 50.55. The mean score of the creativity index of the other ethnicity was 500.94, and the standard deviation was 52.78. The data indicate that the Malay trainee teachers had the highest sum of standard score followed by the Chinese trainee teachers and the others ethnic group.

Table 4.74

Means and Standard Deviations of General Creativity by Ethnicity

Variables	Ethnicity					
	Malay (n = 74)		Chinese (n = 67)		Other (n = 18)	
	M	*SD*	*M*	*SD*	*M*	*SD*
General Creativity						
Sum of Standard Score	**516.84**	46.19	504.37	50.55	500.94	52.78
Creative Index	**112.88**	10.40	110.08	11.71	109.63	12.12

Likewise, the mean score of the creative index score indicate that the Malay trainee teachers had the highest creativity index score followed by the Chinese trainee teachers and the others ethnic group. The mean score of the creativity index of the Malay trainee teachers was 112.88, and the standard deviation was 10.40. The mean score for the creativity index of the Chinese trainee teachers was 110.08, and the standard deviation was 11.71. The mean score of the creativity index of the other ethnicity was 109.63, and the standard deviation was 12.12.

The results indicate that the Malay trainee teachers outperformed the Chinese trainee teachers and the trainee teachers from other ethnic in sum of standard score and creative index of general creativity.

To determine whether there are differences between ethnicity on general creativity, their mean scores were compared by one-way ANOVA and later followed by Tukey HSD test. Table 4.75 presents the results.

The results of analyses of variance reported no significant difference in the mean score of sum of standard score and creative index score between the three ethnic groups. This means that general creativity is independent of ethnicity.

Table 4.75

Summary One-way ANOVA for Differences between Ethnicity and General Creativity

Source	Ethnicity	*Sum of Squares*	*df*	*Mean Square*	*F*	*p*
Sum of Standard Score	Between Groups	7050.06	2	3525.03	1.48	.23
	Within Groups	371760.67	156	2383.08		
	Total	378810.73	158			
Creative Index	Between Groups	333.93	2	166.97	1.34	.27
	Within Groups	19439.39	156	124.61		
	Total	19773.32	158			

Results of Tukey HSD test:

General creativity	*(I) Ethnic*	*(J) Ethnic*	*Mean Difference (I-J)*	*Std. Error*	*p*
Sum of Standard Score	Malay	Chinese	12.46	8.23	.28
		Others	15.89	12.83	.43
	Chinese	Malay	-12.46	8.23	.28
		Others	3.42	12.96	.96
	Others	Malay	-15.89	12.83	.43
		Chinese	-3.42	12.96	.96
Creative Index	Malay	Chinese	2.79	1.88	.30
		Others	3.24	2.93	.51
	Chinese	Malay	-2.79	1.88	.30
		Others	.45	2.96	.98
	Others	Malay	-3.24	2.93	.51
		Chinese	-.45	2.96	.98

Table 4.76 also displays the mean and standard deviations of each component of general creativity.

A comparison within the components of general creativity among ethnic groups show that the Malay trainee teachers had the highest mean score in figural originality (M = 105.31, SD = 12.02), figural elaboration (M = 101.84, SD = 15.08), and figural abstractness of title (M = 97.27, SD = 21.10). Besides that, the Chinese trainee teachers had the highest mean score in figural fluency (M = 106.87, SD = 11.69), and figural resistance to premature closure (M = 107.60, SD = 16.43).

Table 4.76

Means and Standard Deviations for Components of General Creativity by Ethnicity

Variables	Ethnicity					
	Malay (n = 74)		Chinese (n = 67)		Other (n = 18)	
	M	SD	M	SD	M	SD
General Creativity						
Figural Fluency	105.31	12.02	**106.87**	11.69	104.89	12.83
Figural Originality	**105.39**	13.84	104.04	12.45	103.06	11.79
Figural Elaboration	**101.84**	15.08	93.45	15.85	97.50	20.86
Figural Resistance to Premature Closure	107.03	15.45	**107.60**	16.43	102.61	21.37
Figural Abstractness of Title	**97.27**	21.10	92.43	21.55	92.89	20.86

The data suggest that the Malay trainee teachers had higher mean scores than the Chinese trainee teachers and the trainee teachers for other ethnic in three of the five components of general creativity. However, the Chinese trainee teachers had higher mean scores than the Malay trainee teachers and the trainee teachers for other ethnic in two of the five components of general creativity.

This means that the Chinese trainee teachers are more creative than the Malay trainee teachers and the trainee teachers from other ethnic in creating ideas fluently (figural fluency), and resist closure to the idea (figural resistance to premature closure). On the other hand, they are less creative than the Malay trainee teachers in producing original ideas (figural originality), evaluating and elaborating ideas to make it more valuable (figural elaboration), and produce abstract ideas (figural abstractness of title).

The Malay trainee teachers are more creative than the Chinese trainee teachers and the trainee teachers from other ethnic in creating original ideas (figural originality), elaborating them (figural elaboration), and produce abstract ideas (figural abstractness of title). However, they are less creative compared to the Chinese trainee teachers in creating ideas fluently (figural fluency), and resist closure to the idea (figural resistance to premature closure).

To determine whether there are differences between ethnicity on general creativity, their mean scores were compared by one-way ANOVA and later followed by Tukey HSD test. Table 4.77 presents the results of one-way ANOVA. The results of analyses of variance indicate that of five components of general creativity, only one yielded significant difference that was figural elaboration.

Results show significant differences in the mean score of figural elaboration $F(2, 156) = 5.13$, $p < .05$ between the three ethnic groups. Application of Tukey HSD (Appendix E) revealed a significant difference in figural elaboration among the Malay and Chinese trainee teachers (Mean: Malay = 101.84, Chinese = 93.45, $p < .01$). Data also indicate that the critical difference between the means of the Malay trainee teachers and the Chinese trainee teachers was 8.39, at the significance level of.05. It indicates that the Malay trainee teachers scored significantly higher than the Chinese trainee teachers on figural elaboration. This means that the Malay trainee teachers are more creative in elaborating ideas using figures (figural elaboration) than the Chinese trainee teachers.

Results from the Tukey HSD test (Appendix E) yielded no significant differences between ethnicity in the mean score of figural fluency $F(2, 156) = .37$, $p > .05$, figural originality $F(2, 156) = .32$, $p > .05$, figural resistance to premature closure $F(2, 156) = .66$, $p > .05$, and figural abstractness of title $F(2, 156) = .99$, $p > .05$. This means that figural fluency, figural originality, figural resistance to premature closure, and figural abstractness of title are independent of ethnicity.

Table 4.77

Summary One-Way ANOVA for Differences between Ethnicity and Components of General Creativity

Source	Ethnicity	*Sum of Squares*	*df*	*Mean Square*	*F*	*p*
Figural Fluency	Between Groups Within Groups Total	106.51 22363.42 22469.94	2 156 158	53.258 143.355	.37	.69
Figural Originality	Between Groups Within Groups Total	109.73 26583.44 26693.18	2 156 158	54.869 170.407	.32	.73
Figural Elaboration	Between Groups Within Groups Total	2477.21 37701.12 40178.34	2 156 158	1238.609 241.674	5.13	.01**
Figural Resist to Premature Closure	Between Groups Within Groups Total	362.04 43002.34 43364.39	2 156 158	181.023 275.656	.66	.52
Figural Abstractness of Title	Between Groups Within Groups Total	892.08 70534.82 71426.90	2 156 158	446.043 452.146	.99	.38

Note. **significant at $p < .01$,

4.10.3 The Relationship between General Creativity on Academic Years

The mean and standard deviation of the sum of standard score and creative index of general creativity among academic years is shown in Table 4.78.

Data indicate that the mean of sum of standard score of general creativity of the year one trainee teachers was 99.49, and the standard deviation was 11.84. The mean score of sum of standard score of general creativity for the year two trainee teachers was 106.52, and the standard deviation was 9.03. The year three trainee teachers had 100.92 mean scores and the standard deviation was 8.36. The mean score of sum of standard score of general creativity of the year four trainee teachers was 101.94 and the standard deviation was 9.84. Results indicate that the year two trainee teachers had the highest mean score in sum of standard score of general creativity. The trainee teachers that had the lowest mean score was the trainee teachers in year one.

The mean score of creative index for the year one trainee teachers was 108.23, and the standard deviation was 13.48. The mean score of creative index for the year two trainee teachers was 116.10, and the standard deviation was 10.66. The year three trainee teachers had 110.25 mean scores and the standard deviation was 9.88. The mean score of creative index for the year four trainee teachers was 111.04, and the standard deviation was 10.98. The above results indicate that there was no parallel improvement pattern in general creativity as the years of studies increases. Data indicate that the year two trainee teachers had the highest mean score in general creativity and the trainee teachers in year one had the lowest mean score.

Table 4.78

Means and Standard Deviations for General Creativity by Academic Year

Variables	Academic Years							
	Year 1		Year 2		Year 3		Year 4	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
General Creativity								
Sum of Standard Score	99.49	11.84	**106.52**	9.03	100.92	8.36	101.49	9.84
Creative Index	108.23	13.48	**116.10**	10.66	110.25	9.88	111.04	10.98

Table 4.79 presents the results of the one-way ANOVA test and the Tukey HSD test. The results of the analyses of variance indicate that there was a significant difference between academic years and sum of standard score of general creativity $F(3,155) = 2.90$, $p <.05$. However, the creative index yielded no significant difference $F(3,155) = 2.58$, $p > .05$. This means that there is a significant difference between academic years in the five components of general creativity. However, data show no

significant difference when the creative strengths (13 strengths) are added to the sum of standard score (creative index).

Table 4.79

Summary of One-way ANOVA for Differences between Academic Years and General Creativity

Source	Academic Years	*Sum of Squares*	*df*	*Mean Square*	*F*	*p*
Sum of Standard Score	Between Groups	20127.81	3	6709.27	2.90	.04*
	Within Groups	358682.92	155	2314.08		
	Total	378810.73	158			
Creative Index	Between Groups	939.68	3	313.23	2.58	.06
	Within Groups	18833.64	155	121.51		
	Total	19773.32	158			

Results of Tukey HSD test:

General Creativity	*(I) Year*	*(J) Year*	*Mean Difference (I-J)*	*Std. Error*	*p*
Sum of Standard Score	Year 1	Year 2	-35.15*	13.43	.05*
		Year 3	-7.17	12.33	.94
		Year 4	-10.03	11.75	.83
	Year 2	Year 1	35.15*	13.43	.05*
		Year 3	27.99	11.46	.07
		Year 4	25.12	10.82	.10
	Year 3	Year 1	7.17	12.33	.94
		Year 2	-27.99	11.46	.07
		Year 4	-2.87	9.42	.99
	Year 4	Year 1	10.03	11.75	.83
		Year 2	-25.12	10.82	.10
		Year 3	2.87	9.42	.99
Creative Index	Year 1	Year 2	-7.88	3.08	.06
		Year 3	-2.03	2.83	.89
		Year 4	-2.82	2.69	.72
	Year 2	Year 1	7.88	3.08	.06
		Year 3	5.85	2.63	.12
		Year 4	5.06	2.48	.18
	Year 3	Year 1	2.03	2.83	.89
		Year 2	-5.85	2.63	.12
		Year 4	-0.79	2.16	.98
	Year 4	Year 1	2.82	2.69	.72
		Year 2	-5.06	2.48	.18
		Year 3	0.79	2.16	.98

Note. *significant at $p < .05$,

Further analysis with Tukey HSD found that the trainee teachers of the year two had a significantly higher sum of standard score than trainee teachers in year one (Mean: Year two = 116.10; Year one = 108.23, $p < .01$). Data also show that the critical difference between the means for .05 level of significance for the year two trainee teachers and the year one trainee teachers was 35.15. It suggests that the trainee teachers in year two outperformed the trainee teachers in year one in sum of standard score of general creativity.

The mean and standard deviation of components of general creativity and year are shown in Table 4.80.

Table 4.80

Means and Standard Deviations for Components of General Creativity by Year

Variables	Academic Years							
	Year 1		Year 2		Year 3		Year 4	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
General Creativity								
Figural Fluency	102.00	12.49	106.76	11.59	**106.84**	11.23	106.31	12.35
Figural Originality	99.61	15.35	**110.76**	13.65	105.73	10.38	102.65	12.54
Figural Elaboration	101.48	16.68	**104.48**	15.61	95.93	14.81	94.69	15.80
Figural Res. to P. Closure	105.61	13.11	**108.34**	17.19	104.64	18.73	108.00	15.92
Figural Abstractness of Title	88.78	23.92	**102.24**	20.36	91.44	19.27	95.82	21.38

In terms of figural fluency, the mean score of the year one trainee teachers was 102.00 (SD = 12.49), the mean score for the year two trainee teachers was 106.76 (SD = 11.59), the mean score for the year three trainee teachers was 106.84 (SD = 11.23), and the mean score for the year four trainee teachers was 106.31 (SD = 12.35). This means that the year three trainee teachers achieved higher mean scores on figural fluency compared to the trainee teachers from year one, year two and year four.

In terms of figural originality, the mean score of the year one trainee teachers was 99.61 (*SD* = 99.61), the mean score for the year two trainee teachers was 110.76 (*SD* = 13.65), the mean score for the year three trainee teachers was 105.73 (*SD* = 10.38), and the mean score for the year four trainee teachers was 102.65 (*SD* = 12.54). This means that the year two trainee teachers achieved higher means score on figural originality compared to the trainee teachers from year one, year three and year four.

In terms of figural elaboration, the mean score of the year one trainee teachers was 101.48 (*SD* = 16.68), the mean score for the year two trainee teachers was 104.48 (*SD* = 15.61), the mean score for the year three trainee teachers was 95.93 (*SD* = 14.81), and the mean score for the year four trainee teachers was 94.69 (*SD* = 15.80). This means that the year two trainee teachers achieved higher mean scores on figural elaboration compared to the trainee teachers from year one, year three and year four.

In terms of figural resistance to premature closure, the mean score of the year one trainee teachers was 105.61 (*SD* = 13.11), the mean score for the year two trainee teachers was 108.34 (*SD* = 17.19), the mean score for the year three trainee teachers was 104.64 (*SD* = 18.73), and the mean score for the year four trainee teachers was 108.00 (*SD* = 15.92). This means that the year two trainee teachers achieved higher mean scores on figural resistance to premature closure compared to the trainee teachers from year one, year three and year four.

In terms of figural abstractness of title, the mean score of the year one trainee teachers was 88.78 (*SD* = 23.92), the mean score for the year two trainee teachers was 102.24 (*SD* = 20.36), the mean score for the year three trainee teachers was 91.44 (*SD* = 19.27), and the mean score for the year four trainee teachers was 95.82 (*SD* = 21.38). This means that the year three trainee teachers achieved higher mean scores on figural abstractness of title compared to the trainee teachers from year one, year two and year four.

The results indicate that the year two trainee teachers outperformed the other trainee teachers in four of the five components of general creativity. The remaining component (figural fluency) was scored higher by the trainee teachers in year three.

Table 4.81 presents the results of the one-way ANOVA test. The results of the analyses of variance indicate that of the five components of general creativity, two yield significant differences. Hence, three of the five components in general creativity have no significant difference in their mean score on academic years.

Analysis of variance of components in general creativity found that there were significant differences among the four groups of trainee teachers on originality $F(3,155) = 4.11, p <.05$, and elaboration $F(3,155) = 3.23, p < .05$.

Further analysis with Tukey HSD (refer Appendix E) found that the trainee teachers of year two had a significantly higher figural originality than trainee teachers in year one (Mean: Year two = 110.76, Year one = 99.61, $p < .01$). The data also show that the critical difference between the means for the year two trainee teachers and the year one trainee teachers was 11.15 at the significance level of .05. It indicates that the trainee teachers in year two outperformed the trainee teachers in year one in terms of figural originality. Results also indicate that the trainee teachers of year two had a significantly higher figural originality than trainee teachers in year four (Mean: Year two = 110.76, Year four = 102.65, $p < .01$). The data also show that the critical difference between the means for the year two trainee teachers and the year four trainee teachers was 8.11 at the significance level of .05. It indicates that the trainee teachers in year two outperformed the trainee teachers in year four in figural originality.

Tukey HSD results show significant difference in mean score of figural elaboration. The trainee teachers of year two scored higher significantly than trainee teachers of year four in terms of figural elaboration (Mean: Year two = 104.48, Year four = 94.69, $p < .01$). The data indicate that the critical difference between the means for the year two trainee teachers and the year four trainee teachers was 9.79 at the significance level of .05. It shows that the trainee teachers in year two outperformed the trainee teachers in year four in figural elaboration.

Table 4.81

Summary of One-way ANOVA for Differences between Academic Years and Components of General Creativity

Source	Academic Years	*Sum of Squares*	*df*	*Mean Square*	*F*	*p*
Figural Fluency	Between Groups	421.54	3	140.51	.99	.40
	Within Groups	22048.40	155	142.25		
	Total	22469.94	158			
Figural Originality	Between Groups	1967.40	3	655.80	4.11	.01**
	Within Groups	24725.78	155	159.52		
	Total	26693.18	158			
Figural Elaboration	Between Groups	2361.38	3	787.13	3.23	.02*
	Within Groups	37816.96	155	243.98		
	Total	40178.34	158			
Figural Resist to Premature Closure	Between Groups	400.05	3	133.35	.48	.69
	Within Groups	42964.34	155	277.19		
	Total	43364.39	158			
Figural Abstractness of Title	Between Groups	3009.52	3	1003.17	2.27	.08
	Within Groups	68417.38	155	441.40		
	Total	71426.91	158			

Note. *significant at $p < .05$, **significant at $p < .01$,

The results suggest that the trainee teachers in year two outperformed the trainee teachers in year one and year four on figural originality. The trainee teachers in year two also outperformed the trainee teachers in year four on figural elaboration. It can be concluded that figural originality and figural elaboration are influenced by academic years. The other components of general creativity that are figural fluency, figural resistance to premature closure and figural abstractness of title are independent of academic years.

4.10.4 The Relationship between General Creativity and Socioeconomic Status

The mean and standard deviation scores of general creativity according to high and low socioeconomic status of the trainee teachers are shown in Table 4.82. Data indicate that the mean of sum of standard score of general creativity of the trainee teachers from the high socioeconomic status was 515.53 (*SD* = 49.92) and the low socioeconomic status was 507.52 (*SD* = 48.62). The high socioeconomic status trainee teachers had a higher sum of standard score than the low socioeconomic status trainee teachers.

Data in Table 4.82 also presents the mean value of creative index. It was found that the creative index of the trainee teachers of the high socioeconomic status that was 112.73 (*SD* = 11.02) and the low socioeconomic status was 110.78 (*SD* = 11.25). The high socioeconomic status trainee teachers had a higher creative index than the low socioeconomic status trainee teachers.

Table 4.82

Means and Standard Deviations of General Creativity by Socioeconomic Status

Variables	Socioeconomic Status			
	High SES (n = 45)		Low SES (n = 114)	
	M	*SD*	*M*	*SD*
General Creativity				
Sum of Standard Score	**515.53**	49.92	507.52	48.62
Creative Index	**112.73**	11.02	110.78	11.25

To determine whether there is a significant difference between high and low socioeconomic status in general creativity, analysis using independent sample *t*-test was performed. The data are shown in Table 4.83.

The results of the analysis showed that there was no significant difference in the mean score of sum of standard score and creative index of general creativity on socioeconomic status. This means that the status of the family of the trainee teachers did not influence their general creativity.

Table 4.83

Result of Independent Sample t-test for Differences between Socioeconomic Status and General Creativity

General Creativity	Source	*M*	*SD*	*df*	*t*	*p*	*d*
Sum of Scores	Low SES	507.52	48.62	157	-.929	.35	.16
	High SES	515.53	49.92				
Creative Index	Low SES	110.78	11.25	157	.987	.33	.18
	High SES	112.73	11.02				

Table 4.84 presents the means and standard deviations of the components of general creativity. Results show that the mean of figural fluency of the trainee teachers from the low socioeconomic status was 106.04 (*SD* = 11.85). The mean of figural fluency of the trainee teachers from the high socioeconomic status was 105.60 (*SD* = 12.24). This means that the low socioeconomic status trainee teachers achieved higher mean scores on figural fluency compared to the high socioeconomic status trainee teachers.

In terms of figural originality, the data indicate that the mean score of the high socioeconomic status trainee teachers was 105.91 (*SD* = 12.30), and the mean score for the low socioeconomic status trainee teachers was 104.03 (*SD* = 13.28). This means that the high socioeconomic status trainee teachers achieved higher mean scores on figural originality compared to the low socioeconomic status trainee teachers.

In addition, the mean score of figural elaboration of the high socioeconomic status trainee teachers was 98.11 (*SD* = 16.91), and the mean score for the low socioeconomic status trainee teachers was 97.69 (*SD* = 15.63). This means that the high socioeconomic status trainee teachers achieved higher mean scores on figural elaboration compared to the low socioeconomic status trainee teachers.

In terms of figural resistance to premature closure, the mean score of the high socioeconomic status trainee teachers was 109.20 (SD = 16.38), and the mean score for the low socioeconomic status trainee teachers was 105.81 (SD = 16.62). This means that the high socioeconomic status trainee teachers achieved higher mean scores on figural resistance to premature closure compared to the low socioeconomic status trainee teachers.

Table 4.84

Means and Standard Deviations for Components of General Creativity by Socioeconomic Status

Variables	Socioeconomic Status			
	High SES (n = 45)		Low SES (n = 114)	
	M	*SD*	*M*	*SD*
General Creativity				
Figural Fluency	105.60	12.24	**106.04**	11.85
Figural Originality	**105.91**	12.30	104.03	13.28
Figural Elaboration	**98.11**	16.91	97.69	15.63
Figural Resistance to Premature Closure	**109.20**	16.38	105.81	16.62
Figural Abstractness of Title	**96.71**	20.95	93.96	21.43

Besides that, the mean score of musical abstractness of title for the high socioeconomic status trainee teachers was 96.71 (SD = 20.95), and the mean score for the low socioeconomic status trainee teachers was 93.96 (SD = 21.43). This means that the high socioeconomic status trainee teachers achieved higher mean scores on musical abstractness of title compared to the low socioeconomic status trainee teachers.

Results indicate that the high socioeconomic status trainee teachers scored higher than the low socioeconomic status trainee teachers in four of the five components of general creativity.

The independent sample *t*-test was conducted to analyse the differences between the score of the components in general creativity with socioeconomic status. Table 4.85 shows the summary of results. The data indicate that there was no significant difference in the mean score of components of general creativity among the socioeconomic status. It means that general creativity is independent of the socioeconomic status of the trainee teachers.

Table 4.85

Results of Independent Sample t-test for Differences between Socioeconomic Statuses and Components of General Creativity

General Creativity	Source	*M*	*SD*	*df*	*t*	*p*	*d*
Figural Fluency	Low SES High SES	106.04 105.60	11.85 12.24	157	.21	.83	.04
Figural Originality	Low SES High SES	104.03 105.91	13.27 12.30	157	-.82	.41	.15
Figural Elaboration	Low SES High SES	97.69 98.11	15.62 16.90	157	-.15	.88	.03
Figural Resistance to Premature Closure	Low SES High SES	105.81 109.20	16.61 16.37	157	-1.17	.25	.21
Figural Abstractness of Title	Low SES High SES	93.96 96.71	21.42 20.95	157	-.74	.46	.13

4.10.5 Summary of Research Question Nine

1. The results show that general creativity had no significant difference by gender, ethnicity, and socioeconomic status. This means that the gender, ethnicity, and socioeconomic status of the trainee teachers did not influence their general creativity.

2. The results also show that general creativity had significant difference with academic years. This means that academic years of the trainee teachers influenced their general creativity. The year two trainee teachers were more creative in general creativity compared to trainee teachers in year one. The year two trainee teachers were more creative in figural originality than trainee teachers in year one and year four. They were also more creative in figural elaboration than trainee teachers in year four.

4.11 Data Analysis of Research Question Ten

Are there significant relationships between musical creativity and musical exposures among the trainee teachers?

Research question tenth examined the relationships between musical creativity and musical exposes such as keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability.

Descriptive statistic and inferential statistic were used to answer research question tenth. Firstly, descriptive analyses of the mean scores of musical creativity and keyboard grades were examined. This was followed by the analysis of the significant differences between musical creativity and keyboard grades using one-way ANOVA, followed by Tukey HSD. Lastly, Pearson Product Moment Correlation test was used to analyse the relationship of musical creativity among musical activity involvement, aural discrimination, and self-esteem of musical ability. The level of significance was set at $p < .05$ for all statistical tests.

4.11.1 The Relationship between Musical Creativity and Keyboard Grades

The means and standard deviations of musical creativity of the trainee teachers' according to keyboard grades are shown in Table 4.86. The mean scores of the total score of musical creativity for trainee teachers who had no keyboard grades was 39.86 (*SD* = 11.18), the trainee teachers who have grade 1 to 3 in keyboard grades was 42.17 (*SD* = 12.70), the trainee teachers who have grade 4 to 5 in keyboard grades was 42.75 (*SD* = 12.28), the trainee teachers who have grade 6 to 7 in keyboard grades was 46.74 (*SD* = 11.69), and the trainee teachers who have grade 8 and above in keyboard grades was 50.00 (*SD* = 13.05). The results indicate that the mean value of the total score of musical creativity increased as the grade level of keyboard grades increased. The trainee teachers of higher keyboard grades outperformed the trainee teachers of lower keyboard grades in musical creativity.

Table 4.86

Means and Standard Deviations for Musical Creativity by Keyboard Grades

Variables	Keyboard Grades									
	No grades		Grade 1-3		Grade 4-5		Grade 6-7		Grade 8 & above	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Musical Creativitiy	39.86	11.18	42.17	12.70	42.75	12.28	46.74	11.69	**50.00**	13.05

Note. The total score for musical creativity = 70.

Table 4.87 presents the results of one-way ANOVA to determine whether keyboard grades impacted musical creativity scores. The data indicate that there were significant differences between keyboard grades and musical creativity. It was found that there were significant differences in the total score of musical creativity $F(4, 154) = 3.68$, $p < .01$.

Further analysis with Tukey HSD was used to identify which keyboard grades had significant differences in musical creativity. Data revealed that, for the total score of musical creativity, there were significant differences found between the trainee teachers of no grades and grade 8 (Mean: No grades = 39.86, Grade 8 = 50.00, $p < .01$). It indicates that the trainee teachers who had grade 8 and above in keyboard grades outperformed the trainee teachers who have no grades in musical creativity. This means that the trainee teachers' keyboard grades influence musical creativity.

Table 4.87

Summary of One-way ANOVA for Differences between Keyboard Grades and Musical Creativity

Source	Keyboard Grades	Sum of Squares	*df*	Mean Square	*F*	*p*
Musical Creativity	Between Groups	1982.10	4	495.52	3.68	.01**
	Within Groups	20747.58	154	134.73		
	Total	22729.67	158			

Results of Tukey HSD test:

Musical Creativity	*(I) Keyboard grades*	*(J) Keyboard grades*	*Mean Difference (I-J)*	*Std. Error*	*p*
Musical Creativity	None	Grade 1-3	-2.31	4.88	.99
		Grade 4-5	-2.89	3.12	.89
		Grade 6-7	-6.88	2.90	.13
		Grade 8	-10.14**	3.04	.01**
	Grade 1-3	None	2.31	4.88	.99
		Grade 4-5	-.58	5.56	1.00
		Grade 6-7	-4.57	5.44	.92
		Grade 8	-7.83	5.51	.62
	Grade 4-5	None	2.89	3.12	.89
		Grade 1-3	.58	5.56	1.00
		Grade 6-7	-3.99	3.94	.85
		Grade 8	-7.25	4.04	.38
	Grade 6-7	None	6.88	2.90	.13
		Grade 1-3	4.57	5.44	.92
		Grade 4-5	3.99	3.94	.85
		Grade 8	-3.26	3.88	.92
	Grade 8	None	10.14**	3.04	.01**
		Grade 1-3	7.83	5.51	.61
		Grade 4-5	7.25	4.04	.38
		Grade 6-7	3.26	3.88	.92

Note. **significant at $p < .01$,

An analysis of the components of musical creativity with keyboard grades was performed. The data are presented in Table 4.88.

In terms of creative dimension, the data show that the trainee teachers with the high musical ability of grade eight and above had the highest mean score in musical fluency (M = 4.88, SD = 1.62), musical originality (M = 4.71, SD = 1.86), musical elaboration (M = 4.94, SD = 1.78), and musical resistance to premature closure (M =

4.53, *SD*=1. 66). They also scored the highest in the total creative dimension mean score (*M* = 22.47, *SD* = 8.02) However, musical abstractness of title was scored highest by the trainee teachers of grade 1 to 3 (*M* = 5.17, *SD* = .93). This means that the trainee teachers with grade 8 and above in keyboard grades outperformed the other trainee teachers in four of the five components in creative dimension.

In terms of technical goodness, data indicate that the trainee teachers with grade 8 and above in keyboard grades had the highest mean score in craftsmanship (*M* = 4.35, *SD* = 1.62), and musical syntax (*M* = 5.24, *SD* = 1.79). This means that the trainee teachers with grade 8 and above outperformed the other trainee teachers in both of the components of technical goodness.

The other dimension of musical creativity is aesthetic appeal. Likewise, data indicate that the trainee teachers with grade 8 and above in keyboard grades had the highest mean score in musical sensitivity (*M* = 4.98, *SD* = 1.78). This means that the trainee teachers with grade 8 and above outperformed better than the other trainee teachers in musical sensitivity.

However, repetition of song was scored highest by the trainee teachers with keyboard ability of grade 6 to 7 (*M* = 6.21, *SD* = .54).

The results above show that the trainee teachers with keyboard grades of grade 8 and above had highest mean score in seven of the nine components in musical creativity. Interesting to note that the musical creativity means scores developed positively as the keyboard grades of the trainee teachers increased. Hence, it can be said that there is a gradual improvement of musical creativity as the abilities of keyboard playing increases.

Table 4.88

Means and Standard Deviations for Components of Musical Creativity by Keyboard Grades

Variables	Keyboard Grades									
	No grades		Grade 1-3		Grade 4-5		Grade 6-7		Grade 8 & above	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Musical Creativity										
CDM										
MFLU	3.88	1.53	3.83	1.47	4.19	1.76	4.79	1.44	**4.88**	1.62
MORI	3.72	1.49	3.33	1.37	3.44	1.90	4.11	1.79	**4.71**	1.86
MELA	3.68	1.66	3.67	1.86	3.75	1.77	4.47	1.99	**4.94**	1.78
MABS	3.50	1.41	3.83	1.47	3.81	1.68	4.21	1.51	**4.53**	1.66
MRES	4.64	1.02	**5.17**	.98	4.69	1.20	4.79	1.36	4.76	1.20
Total CD	19.25	5.93	18.83	4.54	19.88	7.32	22.42	6.37	22.47	8.02
TCGN										
CRFT	3.79	1.55	4.50	1.98	5.00	1.03	4.84	1.43	**5.35**	1.62
MSYX	3.78	1.55	4.50	1.38	4.69	1.25	4.63	1.46	**5.24**	1.79
Total TG	7.52	2.87	8.83	2.93	9.69	2.15	9.47	2.82	10.59	3.37
ACAP										
MSEN	3.40	1.58	4.00	2.00	3.75	1.65	4.58	1.54	**4.94**	1.78
REPT	5.94	.85	5.00	1.09	5.88	.96	**6.21**	.54	6.06	.75

Note. The total score for musical creativity = 70.

CDM: Creative Dimension
MFLU: Musical Fluency
MORI: Musical Originality
MELA: Musical Elaboration
MABS: Musical Abstractness of Title
MRES: Musical Resistance to Premature Closure
TCGN: Technical Goodness
CRFT: Craftsmanship
MSYX: Musical Syntax
ACAP: Aesthetic Appeal
MSEN: Musical Sensitivity
REPT : Repetition of Song

To determine whether there are significant differences among keyboard grades on the components of musical creativity, their mean scores were compared by one-way ANOVA and later followed by Tukey HSD test. Table 4.88 presents the results of one-way ANOVA.

The results of analysis of variance show that of nine components of musical creativity, five yield significant differences. The components that had significant difference with keyboard grades were musical fluency $F(4, 154) = 2.58$, $p < .05$, musical elaboration $F(4, 154) = 2.56$, $p < .05$, craftsmanship $F(4, 154) = 6.66$, $p < .05$, musical syntax $F(4, 154) = 4.63$, $p < .05$, and musical sensitivity $F(4, 154) = 4.80$, p

$< .05$. However, a detailed analysis using Tukey HSD (refer to Appendix E) revealed that there was no significant difference found between the keyboard grades of the trainee teachers and musical fluency. Hence, out of nine components of musical creativity, only four yielded significant differences.

The analysis with Tukey post-hoc test, making comparisons of the five groups of keyboard grades with the mean score of musical elaboration indicate that the trainee teachers of grade 8 and above ($M = 4.94$, $p = .05$) had significantly higher musical elaboration mean score than the trainee teachers without grades ($M = 3.91$, $p = .05$). The critical difference between the means for .05 level of significance for the trainee teachers with grade 8 and above in keyboard grades and the trainee teachers who had no keyboard grades was 1.258. This shows that in terms of musical elaboration, the trainee teachers with grade 8 and above in keyboard grades scored significantly higher than the trainee teachers who had no keyboard grades in musical elaboration.

The analysis of Tukey post-hoc on craftsmanship reported a significant difference in mean scores found between the trainee teachers with no keyboard grades, and the trainee teachers with grade 4 to 5 (Mean: No grades = 3.79, Grade 4 to 5 = 5.00, $p < .01$). The data indicate that the critical difference between the means for the trainee teachers with no keyboard grades and the trainee teachers with grade 4 to 5 was -1.21 at a significant level of .05. This shows that in terms of craftsmanship, the trainee teachers with grade 4 to 5 in keyboard grades scored significantly higher than the trainee teachers who had no keyboard grades.

There was also a significant difference in mean scores of craftsmanship between the trainee teachers with no keyboard grades, and the trainee teachers with grade 6 to 7 (Mean: No grades = 3.79, Grade 6 to 7 = 4.84, $p < .01$). The data indicate that the critical difference between the means (significant at .05 levels) for the trainee teachers with no keyboard grades and the trainee teachers with grade 6 to 7 was -1.050. This means that in terms of craftsmanship, the trainee teachers with grade 6 to 7 in keyboard grades scored significantly higher than the trainee teachers who had no keyboard grades.

Table 4.89

Summary of One-way ANOVA for Differences between Keyboard Grades and Components of Musical Creativity

Source	Keyboard Grades	*Sum of Squares*	*df*	*Mean Square*	*F*	*p*
Musical Fluency	Between Groups	24.72	4	6.18	2.58	.04*
	Within Groups	368.77	154	2.40		
	Total	393.48	158			
Musical Originality	Between Groups	19.59	4	4.90	1.89	.12
	Within Groups	398.83	154	2.59		
	Total	418.42	158			
Musical Elaboration	Between Groups	30.06	4	7.52	2.56	.04*
	Within Groups	451.87	154	2.93		
	Total	481.94	158			
Musical Resist to Premature Closure	Between Groups	20.99	4	5.25	2.39	.05
	Within Groups	337.91	154	2.19		
	Total	358.91	158			
Musical Abstractness of Title	Between Groups	1.85	4	.46	.38	.82
	Within Groups	185.66	154	1.21		
	Total	187.51	158			
Craftsmanship	Between Groups	57.85	4	14.46	6.66	.00***
	Within Groups	334.54	154	2.17		
	Total	392.39	158			
Musical Syntax	Between Groups	43.44	4	10.86	4.63	.00**
	Within Groups	361.63	154	2.35		
	Total	405.07	158			
Musical Sensitivity	Between Groups	50.19	4	12.55	4.80	.00**
	Within Groups	402.73	154	2.62		
	Total	452.92	158			
Repetition of Song	Between Groups	1.45	4	.36	.53	.71
	Within Groups	105.49	154	.69		
	Total	106.94	158			

Note. *significant at $p < .05$, **significant at $p < .01$, ***significant at $p < .001$

Similarly, the data indicate that there was also a significant difference in mean scores of craftsmanship between the trainee teachers with no keyboard grades, and the trainee teachers with grade 8 and above (Mean: No grades = 3.79, Grade 8 and above =

5.35, $p < .01$). The critical difference between the means (significant at .05 levels) for the trainee teachers with no keyboard grades and the trainee teachers with grade 8 and above was -1.561. This indicates that in terms of craftsmanship, the trainee teachers with grade 8 and above in keyboard grades scored significantly higher than the trainee teachers who had no keyboard grades.

As for musical syntax, the results of Tukey post-hoc HSD revealed that there was a significant difference in mean scores found between the trainee teachers with no keyboard grades, and the trainee teachers with grade 8 and above (Mean: No grades = 3.78, Grade 4 to 5 = 5.24, $p < .01$). The critical difference between the means (significant at .05 levels) for the trainee teachers with no keyboard grades and the trainee teachers with grade 8 and above was -1.453. The results indicate that in terms of musical syntax, the trainee teachers with grade 8 and above in keyboard grades scored significantly higher than the trainee teachers who had no keyboard grades.

Results in Table 4.89 also show that there was a significant difference in mean scores of musical sensitivity between the trainee teachers with no keyboard grades, and the trainee teachers with grade 6 to 7 (Mean: No grades = 3.40, Grade 6 to 7 = 4.58, $p < .01$). The critical difference between the means (significant at .05 levels) for the trainee teachers with no keyboard grades and the trainee teachers with grade 6 to 7 was -1.183. The results indicate that in terms of musical sensitivity, the trainee teachers with grade 6 to 7 in keyboard grades scored significantly higher than the trainee teachers who had no keyboard grades.

In addition, there was also a significant difference in mean scores of musical sensitivity between the trainee teachers with no keyboard grades, and the trainee teachers with grade 8 and above (Mean: No grades = 3.40, Grade 8 and above = 4.94, $p < .01$). The critical difference between the means (significant at .05 levels) for the trainee teachers with no keyboard grades and the trainee teachers with grade 8 and above was -1.545. The results indicate that in terms of musical sensitivity, the trainee teachers with grade 8 and above in keyboard grades scored significantly higher than the trainee teachers who have no keyboard grades.

In summary, the results of ANOVA analyses between the five keyboard grades on musical creativity and its components can be summarised as follows:

1. The trainee teachers with grade 8 and above scored significantly higher than the trainee teachers with no keyboard grades on musical elaboration, craftsmanship, musical syntax, and musical sensitivity. This means that a trainee teacher who has high keyboard abilities is able to elaborate ideas (musical elaboration), possesses technical mastery of tonal centre and rhythmic regularity (craftsmanship), able to compose music that makes sense (musical syntax), and able to compose expressive composition that reflect the aesthetic sensitivity in music (musical sensitivity). The trainee teachers who have keyboard grades outperformed the trainee teachers without keyboard grades in four of the nine components of musical creativity.
2. There was no significant difference found between keyboard grades and musical fluency, musical originality, musical resistance to premature closure, musical abstractness of title, and repetition of song. This means that a trainee teacher who has high keyboard abilities is not necessarily able to produce ideas fluently (musical fluency), produces original ideas (musical originality), resist closure to an idea (musical resistance to premature closure), produce abstract title (musical abstractness of title), and repeat a composition accurately (repetition of song).

4.11.2 The Relationship between Musical Creativity and Musical Activity Involvement

The correlation coefficient matrix in Table 4.90 shows the correlation between musical creativity and musical activity involvement. Pearson product-moment correlation analysis was used to investigate their relationships. The data show that musical activity involvement correlated with four of the eight components of musical creativity.

As shown in Table 4.90, there was a significant correlation between musical activity involvement and musical fluency $r = .27$ ($p < .01$). The correlation was very weak and positive. There was also a significant correlation between musical activity involvement and musical originality $r = .16$ ($p < .01$). Similarly, the correlation was very weak and positive. Subsequently, significant correlation was found between musical activity involvement and musical elaboration $r = .21$ ($p < .01$), and between musical activity involvement and musical resistance to premature closure $r = .16$ ($p < .01$). Both of these correlations were very weak and positive.

The results also show that musical activity involvement was not significantly correlated with musical abstractness of title $r = .13$ ($p > .01$), craftsmanship $r = .09$ ($p > .01$), musical syntax $r = .13$ ($p > .01$), musical sensitivity $r = .13$ ($p > .01$), and repetition of song $r = -.07$ ($p > .01$).

The results imply that trainee teachers who have a strong musical activity involvement are able to create ideas (musical fluency), create original ideas (musical originality), elaborate ideas (musical elaboration), and resists premature closure to an idea (musical resistance to premature closure) than those with less musical activity involvement. However, trainee teachers with a strong musical activity involvement not necessarily are able to create abstract ideas (musical abstractness of title), or have good technical abilities (craftsmanship and musical syntax) or have musical sense (musical sensitivity) or the ability to repeat composition accurately.

Table 4.90

Correlations Matrix of Musical Creativity and its Components with Musical activity involvement

Musical Creativity	*r*
Creative Dimension	
Musical Fluency	.27**
Musical Originality	.16*
Musical Elaboration	.21**
Musical Resistance to Premature Closure	.16*
Musical Abstractness of Title	.13
Technical Goodness	
Craftsmanship	.09
Musical Syntax	.13
Aesthetic Appeal	
Musical Sensitivity	.13
Repetition of Song	-.07
Musical Creativity	19*

Note. **Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).

4.11.3 The Relationship between Musical Creativity and Aural Discrimination

The results of the relationship between musical creativity and Aural Discrimination are presented in Table 4.91. The correlations of musical creativity with aural discriminations are discussed first. Following that is the discussion of the correlations between components of musical creativity and components of aural discriminations.

Table 4.91 presents the correlations between musical creativity with the components of aural discrimination.

Table 4.91

Correlational Analysis between Musical Creativity and Components of Aural Discrimination

Variables	Aural Discrimination						
	PIT	INT	MET	CAD	VIS	MODE	Total
Musical Creativity	.36**	.43**	.24**	.30**	.42**	.20*	.48**

Note. **Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).

PIT: Pitch Discrimination
INT: Interval Discrimination
MET: Meter Discrimination
CAD: Cadence Recognition
VIS: Aural and Visual Discrimination
MODE: Mode Recognition

The results of Pearson Product Moment correlation analysis show that all of the six components in aural discrimination correlated with musical creativity. The correlation was significant and positive. A detailed analysis revealed that the musical creativity had a weak correlation with total score of aural discrimination (r = .48, p < .01), interval discrimination (r = .43, p < .01), auditory-visual discrimination (r = .42, p < .01), and pitch discrimination (r = .36, p < .01). Besides that musical creativity had a very weak correlation with meter discrimination (r = .24, p < .01), cadence recognition (r = .30, p < .01), and mode discrimination (r = .20, p < .01). It means that the trainee teachers who have good aural skills such as pitch discrimination, interval discrimination, meter discrimination, cadence recognition, aura-visual discrimination, and mode discrimination are likely to be musically creative. In other words, a trainee teacher who performs excellently in aural discrimination will probably have higher musical creativity abilities.

Table 4.92 shows the relationship between components of musical creativity and components of aural discriminations. A detailed analysis of the total score of aural discrimination revealed that, all the nine components in musical creativity correlated positively and significantly with total aural discrimination scores. However, the correlations were low. They range from .18 (musical abstractness of title and repetition of song) to .48 (musical sensitivity). It suggests that the trainee teachers who exhibit good aural discrimination skills are likely to be creative in all of the components of musical creativity.

Following is detailed discussion according to the components of musical creativity as shown in Table 4.92.

In terms of musical fluency, results indicate significant positive correlation between musical fluency and all of the six components of aural discrimination and the score ranged from .17 (mode discrimination) to .39 (interval discrimination). The correlations were between weak and very weak. It means that the trainee teachers who exhibit high aural discrimination in all of the six components will probably be creative in musical fluency. In other words, a trainee teacher who exhibits good Aural Discrimination skills will probably be able to produce ideas fluently while composing a piece (musical fluency).

In terms of musical originality, results show significant positive correlation between musical originality and four of the six components of aural discrimination. Musical originality had significant correlations with pitch discrimination (r = .26, p < .01), interval discrimination (r = .29, p < .01), cadence recognition (r = .23, p < .01), and auditory-visual discrimination (r = .24, p < .01). There were no significant correlations found between musical originality and meter discrimination (r = .08, p > .01), and mode discrimination (r = .12, p > .01).

The data suggest that the trainee teachers who exhibit good results in pitch discrimination, interval discrimination, cadence recognition, and auditory-visual discrimination are likely to be creative in musical originality.

In other words, a trainee teacher who exhibits good results in tests that concern the perception of pitches (pitch discrimination), distance between pitches (interval discrimination), identifying the chord progression (cadence recognition), and ability to match pitch heard with notation (auditory-visual discrimination) is likely to be able to produce creative and original ideas in a composition (musical originality).

Table 4.92

Correlational Analysis between Components of Musical Creativity and Components of Aural Discrimination

Variables	Aural Discrimination						
	PIT	INT	MET	CAD	VIS	MODE	Total
Musical Creativity							
MFLU	.29**	.39**	.22**	.27**	.33**	.17**	.41**
MORI	.26**	.29**	.08	.23**	.24**	.12	.32**
MELA	.33**	.38**	.18*	.21**	.35**	.17*	.42**
MRES	.30**	.42**	.25**	.29**	.35**	.22**	.44**
MABS	.08	.17*	.16*	.12	.18*	.15	.18*
CRFT	.34**	.39**	.27**	.31**	.42**	.16*	.46**
MSYX	.31**	.37**	.31**	.26**	.40**	.18**	.43**
MSEN	.40**	.40**	.21**	.25**	.50**	.18*	.48**
REPT	.18*	.16*	-.00	.08	.13	.04	.18*

Note. **Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).

PIT: Pitch Discrimination
INT: Interval Discrimination
MET: Meter Discrimination
CAD: Cadence Recognition
VIS: Aural and Visual Discrimination
MODE: Mode Recognition

MFLU: Musical Fluency
MORI: Musical Originality
MELA: Musical Elaboration
MABS: Musical Abstractness of Title
MRES: Musical Resistance to Premature Closure
CRFT: Craftsmanship
MSYX: Musical Syntax
MSEN: Musical Sensitivity
REPT : Repetition of Song

In terms of musical elaboration, analysis of data revealed significant positive correlation between musical elaboration and all of the six components of aural discrimination and the score ranged from .17 (mode discrimination) to .38 (interval discrimination). The correlations were between weak and very weak. It means that the trainee teachers who exhibit a high aural discrimination in all of the six components are likely to be creative in musical elaboration. In other words, a trainee teacher who is good in aural discrimination skills is likely to be good in elaborating ideas while composing a piece.

Likewise, results for musical resistance to premature closure show significant positive correlation between musical resistance to premature closure and all of the six components of aural discrimination and the score ranged from .22 (mode discrimination) to .42 (interval discrimination). The correlations were between weak and very weak. It means that the trainee teachers who exhibit high aural discrimination skills in all of the six components are likely to be also creative in musical resistance to premature closure. In other words, a trainee teacher who has good aural discrimination skills is likely to be able to resist closing to an idea while composing a piece.

In terms of musical abstractness of title, results show significant positive correlation between the musical abstractness of title and three of the six components of aural discrimination. Musical abstractness of title had significant correlations with interval discrimination (r = .17, p < .01), meter discrimination (r = .16, p < .01), and auditory-visual discrimination (r = .18, p < .01). The correlations were very weak. There were no significant correlations found between the musical abstractness of title and pitch discrimination (r = .08, p > .01), cadence recognition (r = .12, p > .01), and mode discrimination (r = .15, p > .01).

The results suggest that the trainee teachers who exhibit good results in, interval discrimination, meter discrimination, and auditory-visual discrimination are likely to be creative in the musical abstractness of title.

In other words, a trainee teacher who exhibits good results in tests concerning the distance between pitches (interval discrimination), identify the chord progression (cadence recognition), and is able to match pitch heard with notation (auditory-visual discrimination) is most probably able to produce an abstract title for a composition (musical abstractness of title).

In terms of craftsmanship, results show significant positive correlation between craftsmanship and all of the six components of aural discrimination and the score ranged from .16 (mode discrimination) to .42 (auditory-visual discrimination). The correlations were between weak and very weak. It means that the trainee teachers who exhibit a high aural discrimination in all of the six components are likely to be creative in craftsmanship. In other words, a trainee teacher who performs well in aural discrimination will probably be able to use tonal and rhythmic elements while composing a piece (craftsmanship).

Likewise, results for musical syntax show significant positive correlation between musical syntax and all of the six components of aural discrimination and the score ranged from .18 (mode discrimination) to .40 (auditory-visual discrimination). The correlations were between weak and very weak. It means that the trainee teachers who exhibit high aural discrimination in all of the six components are likely to be creative in musical syntax. In other words, a trainee teacher who performs well in aural discrimination is likely able to structure the tonal and rhythmic patterns in a composition in a logical manner so that the music makes sense (musical syntax).

Similarly, results for musical sensitivity show significant positive correlation between musical sensitivity and all of the six components of aural discrimination and the score ranged from .18 (mode discrimination) to .50 (auditory-visual discrimination). The correlations were between weak and very weak. It means that the trainee teachers who exhibit a high aural discrimination in all of the six components are likely to be creative in musical sensitivity. In other words, a trainee teacher who performs well in Aural Discrimination is able to compose an expressive piece (musical sensitivity).

Repetition of song had correlation with two of the five components of aural discrimination. It had significant correlations with pitch discrimination (r = .18, $p < .01$), and interval discrimination (r = .16, $p < .01$). The correlations were very weak. There were no significant correlations found between the musical abstractness of title and meter discrimination (near 0), cadence recognition (r = .08, $p > .01$), auditory-visual discrimination ($r = .13$, $p >. 01$), and mode discrimination ($r = .04$, $p > .01$). It means that a trainee teacher who has the ability to perform well in tests that concern perception of pitches (pitch discrimination), and distance between pitches (interval discrimination) are likely to be able to repeat a composition well.

In summary, all the nine components of musical creativity are significantly associated with aural discrimination. The correlations are positive but weak. In other words, aural discrimination is likely to influence musical creativity.

4.11.4 The Relationship between Musical Creativity and Self-Esteem of Musical Ability

The results of the correlation of musical creativity and self-esteem in musical ability analysed using Pearson Product Moment correlation coefficient is shown in Table 4.93. The data indicate that there were significant correlations between self-esteem in musical ability and eight of the nine components of musical creativity.

In terms of creative dimension, results indicate that there were significant correlations between self-esteem in musical ability and musical fluency ($r = .22$, $p < .01$), between self-esteem in musical ability and musical originality ($r = .29$, $p < .01$), between self-esteem in musical ability and musical elaboration ($r = .21$, $p < .01$), between self-esteem in musical ability and musical resistance to premature closure ($r = .25$, $p < .01$), and between self-esteem in musical ability and musical abstractness of title ($r = .21$, $p < .01$). The correlations were positive but very weak. It suggests that the trainee teachers who have high self-esteem in musical ability are likely to be creative in musical fluency, musical originality, musical elaboration, musical resistance to premature closure, and the musical abstractness of title.

This means that a trainee teacher who has, (a) high self-perception of his or her music abilities, (b) the support and recognition by others for his or her musical skills, and (c) personal interest and desire in music (self-esteem of musical ability) are likely to be able to, (a) produce spontaneous ideas fluently (musical fluency), (b) produce unique and original ideas (musical originality), (c) build upon a musical idea by extending, reshaping, and refining the musical elements (musical elaboration), (d) resist closing on a motif (musical resistance to premature closure), and produce titles that capture the essence of the composition (musical abstractness of title).

Table 4.93

Correlations Matrix of Musical Creativity and its Components with Self-esteem in Musical Ability

Musical Creativity	*r*
Creative Dimension	
Musical Fluency	.22**
Musical Originality	.29**
Musical Elaboration	.21**
Musical Resistance to Premature Closure	.25**
Musical Abstractness of Title	.20*
Technical Goodness	
Craftsmanship	.28**
Musical Syntax	.30**
Aesthetic Appeal	
Musical Sensitivity	.26**
Repetition of Song	.08
Musical Creativity	.31**

Note. **Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).

In terms of technical goodness, there were significant correlations between self-esteem and craftsmanship (r = .28, p < .01), and between self-esteem in musical ability and musical syntax (r = .30, p < .01). The correlations were positive and very weak. It suggests that trainee teachers who have high self-esteem in musical ability are likely to be creative in craftsmanship and musical syntax.

This means that a trainee teacher who has high self-perception of his or her music abilities, the support, and recognition by others for his or her musical skills, and personal interest and desire in music (self-esteem of musical ability) is likely to be able to compose with tonal and metric cohesiveness (craftsmanship) and able to structure the composition in a logical manner so that the music makes sense (musical syntax).

Table 4.93 also show that there was a correlation between self-esteem in musical ability and musical sensitivity (r = .26, p < .01). The correlation was positive and very weak. The results indicate that trainee teachers who have high self-esteem in musical ability are likely to be creative in musical sensitivity. This means that a trainee teacher who is has high self-perception of his or her music abilities, the support, and recognition by others for his or her musical skills, and personal interest and desire in music (self-esteem in musical ability of musical ability) is likely to be able to compose an expressive piece that reflects the aesthetic sensitivity in the whole composition (musical sensitivity).

Lastly, the data in Table 4.93 show no significant correlation between self-esteem in musical ability and repetition of song (r = .08, p > .01). It could be that to repeat a composition does not require a high level of self-esteem in musical ability.

4.11.5 Summary of Result for Research Question Ten

1. Keyboard grades had significant difference with musical creativity. There was a gradual improvement in musical creativity as the keyboard grades increased. The trainee teachers who had good keyboard grades were significantly more creative in musical elaboration, craftsmanship, musical syntax, musical sensitivity, and musical creativity than trainee teachers who had less keyboard grades.

2. Musical activity involvement was significantly associated with musical creativity. It was also significantly associated with musical fluency, musical originality, and musical elaboration. However, the correlation was weak. This means that a trainee teacher who is involved in many musical activities such as choir, *gamelan*, recorder ensemble, orchestra, or person music lesson (musical activity involvement) is likely to have the ability to produce musical ideas fluently (musical fluency), produce a unique composition (musical originality), and extend or reshape or refine musical ideas (musical elaboration).

3. There was a significant correlation between total scores of aural discrimination with musical creativity. This means that a trainee teacher who is good in aural discrimination is generally creative musically.

4. Self-esteem of musical ability was significantly associated with eight of nine components of musical creativity. This means that a trainee teacher, who has a high self-perception of his or her music abilities is likely to have high musical creativity.

4.12 Data Analysis of Research Question Eleven

Are there significant relationships between general creativity and musical exposures among the trainee teachers?

Research question eleven investigated the relationships between general creativity and musical exposures such as keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability.

Descriptive statistic and inferential statistic were used to answer research question eleven. Firstly, descriptive analyses of the mean scores and one-way ANOVA were administered to determine significant differences between general creativity and its components with keyboard grades. Tukey HSD was also employed to determine which group of the variables had significant differences in the analysis. Following that, the relationships of general creativity among musical activity involvement, aural discrimination, and self-esteem were analysed with Pearson Product Moment Correlation.

4.12.1 The Relationship between General Creativity and Keyboard Grades

Table 4.94 presents the mean and standard deviation scores of general creativity according to the trainee teachers' keyboard grades.

The mean scores of the sum of standard score of general creativity for trainee teachers who had no keyboard grades was 514.86 (SD = 46.77), the trainee teachers who had grade 1 to 3 in keyboard grades was 480.50 (SD = 49.15), the trainee teachers who had grade 4 to 5 in keyboard grades was 497.81 (SD = 55.69), the trainee teachers who had grade 6 to 7 in keyboard grades was 506.32 (SD = 56.12), and the trainee teachers who had grade 8 and above in keyboard grades was 505.12 (SD = 46.16).

The mean scores of the creative index of general creativity for trainee teachers who had no keyboard grades was 112.46 (*SD* = 10.64), the trainee teachers who had grade 1 to 3 in keyboard grades was 105.77 (*SD* = 11.51), the trainee teachers who had grade 4 to 5 in keyboard grades was 108.94 (*SD* = 13.26), the trainee teachers who had grade 6 to 7 in keyboard grades was 111.37 (*SD* = 13.34), and the trainee teachers who had grade 8 and above in keyboard grades was 108.85 (*SD* = 9.51).

Table 4.94

Means and Standard Deviations of General Creativity by Keyboard Grades

Variables	Keyboard Grades									
	No grades		Grade 1-3		Grade 4-5		Grade 6-7		Grade 8 & above	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
General Creativity										
SUMSS	**514.86**	46.773	480.50	49.1472	497.81	55.693	506.32	56.118	505.12	46.161
CI	**112.46**	10.64	105.77	11.51	108.94	13.26	111.37	13.34	108.85	9.51

Note. GENC: General Creativity; SUMSS: Sum of Standard Score; CI: Creative Index

It is interesting to note that the trainee teachers without keyboard grades scored the highest in the sum of standard score and creativity index of general creativity compared to the trainee teachers who had keyboard grades. The trainee teachers who had keyboard grades between grade 1 to 3 scored the lowest in the mean of the sum of standard score and creativity index of general creativity.

Results of analysis of one-way ANOVA of sum of standard score and creative index are shown in Table 4.95. Data indicate that there was no significant difference in the mean score of sum of standard score and creative index among the academic years. This means that sum of standard score and creative index of general creativity is independent of academic years.

Table 4.95

Summary of One-way ANOVA for Differences between Keyboard Grades and General Creativity

Source	Keyboard Grades	*Sum of Squares*	*df*	*Mean Square*	*F*	*p*
Sum of Standard Score	Between Groups	510.50	4	127.63	1.11	.35
	Within Groups	19262.82	154	125.08		
	Total	19773.32	158			
Creative Index	Between Groups	10640.86	4	2660.22	1.02	.40
	Within Groups	368169.87	154	2390.71		
	Total	378810.73	158			

Results of Tukey HSD test:

General Creativity	*(I) Keyboard grades*	*(J) Keyboard grades*	*Mean Difference (I-J)*	*Std. Error*	*p*
Sum of Standard Score	None	Grade 1-3	34.36	20.55	.45
		Grade 4-5	17.05	13.16	.69
		Grade 6-7	8.55	12.23	.96
		Grade 8	9.74	12.82	.94
	Grade 1-3	None	-34.36	20.55	.45
		Grade 4-5	-17.31	23.41	.95
		Grade 6-7	-25.82	22.90	.79
		Grade 8	-24.62	23.22	.83
	Grade 4-5	None	-17.05	13.16	.69
		Grade 1-3	17.31	23.41	.95
		Grade 6-7	-8.50	16.59	.99
		Grade 8	-7.31	17.03	.99
	Grade 6-7	None	-8.55	12.23	.96
		Grade 1-3	25.82	22.90	.79
		Grade 4-5	8.50	16.59	.99
		Grade 8	1.20	16.32	1.00
	Grade 8	None	-9.74	12.82	.94
		Grade 1-3	24.62	23.22	.83
		Grade 4-5	7.31	17.03	.99
		Grade 6-7	-1.20	16.32	1.00
Creative Index	None	Grade 1-3	6.69	4.70	.61
		Grade 4-5	3.52	3.01	.77
		Grade 6-7	1.09	2.80	1.00
		Grade 8	3.61	2.93	.73
	Grade 1-3	None	-6.69	4.70	.61
		Grade 4-5	-3.17	5.35	.98
		Grade 6-7	-5.60	5.24	.82
		Grade 8	-3.08	5.31	.98
	Grade 4-5	None	-3.52	3.01	.77
		Grade 1-3	3.17	5.35	.98
		Grade 6-7	-2.43	3.80	.97
		Grade 8	.09	3.90	1.00
	Grade 6-7	None	-1.09	2.80	1.00
		Grade 1-3	5.60	5.24	.82
		Grade 4-5	2.43	3.80	.97
		Grade 8	2.52	3.73	.96
	Grade 8	None	-3.61	2.93	.73
		Grade 1-3	3.08	5.31	.98
		Grade 4-5	-.09	3.90	1.00
		Grade 6-7	-2.52	3.73	.96

Table 4.96 presents the mean and standard deviation scores of components of general creativity according to the trainee teachers' keyboard grades.

Table 4.96

Means and Standard Deviations for Components of General Creativity by Keyboard Grades

Variables	Keyboard Grades									
	No grades		Grade 1-3		Grade 4-5		Grade 6-7		Grade 8 & above	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
General Creativity										
FFLU	105.78	11.44	105.33	16.40	101.50	9.74	107.42	14.44	**109.41**	12.00
FORI	104.36	12.95	105.17	14.53	99.88	12.38	**107.79**	14.85	106.35	11.20
FELA	**100.72**	15.61	78.33	8.17	97.25	12.84	97.05	15.09	88.76	16.52
FRES	107.21	16.46	101.00	10.56	107.13	9.91	100.79	21.68	**112.53**	16.45
FABS	**96.79**	20.31	90.67	19.22	92.13	28.04	93.26	19.54	88.06	23.40
SUMSS	**514.86**	46.77	480.50	49.15	497.81	55.69	506.32	56.12	505.12	46.16
CI	**112.46**	10.64	105.77	11.51	108.94	13.26	111.37	13.34	108.85	9.51

Note.

FFLU: Musical Fluency
FORI: Musical Originality
FELA: Musical Elaboration
FABS: Musical Abstractness of Title
FRES: Musical Resistance to Premature Closure
SUMSS: Sum of Standard Score
CI: Creative Index

The trainee teachers of grade eight and above had the highest mean score for figural fluency (*M* = 109.41, *SD* = 12.00), and figural resistance to premature closure (*M* = 112.53, *SD* = 16.45). However, they had the lowest score (*M* = 88.06, *SD* = 23.40) in figural abstractness of title.

The figural originality was scored highest by the trainee teachers that had keyboard grades of grade 6 to 7 (*M* = 107.79, *SD* = 14.85).

The trainee teachers who had no keyboard grades upon entering the institution scored highest in the mean score of figural elaboration (M = 100.72, SD = 15.61), and figural abstractness of title (M = 96.79, SD = 20.31).

Results show that the trainee teachers who had no keyboard grades outperformed two of the five components of general creativity. It can be concluded that there was no pattern of progress in general creativity as the ability in keyboard playing increases.

One way ANOVA is used to analyse the significant difference between the mean score of the components of general creativity according to the trainee teachers' keyboard grades. Results in Table 4.97 show that there were significant differences in the means of figural elaboration $F(4, 154) = 4.90, p < .01$, according to trainee teachers' keyboard grades. Of five components in general creativity, only one yield significant difference.

A multiple comparison using Tukey HSD analysis found that the trainee teachers with no grades had significant differences in figure elaboration with trainee teachers of grade 1 to 3 (Mean: No grades = 100.72, Grade 1 to 3 = 78.33, $p < .01$). The critical difference between the means of the trainee teachers with no grades and the trainee teachers of grade 1 to 3 was 22.39 at a significance level of .05.

Results indicate that the trainee teachers who had no grade in keyboard had significant differences in figure elaboration with the trainee teachers of grade 8 and above (Mean: No grades = 100.72, Grade 8 and above = 88.76, $p < .01$). The critical difference between means the trainee teachers with no grades and the trainee teachers of grade 8 and above was 11.96 at a significance level of .05.

This means that in terms of figural elaboration, the trainee teachers with no grades in keyboard grades scored significantly higher than the trainee teachers who had grade 1 to 3 and grade 8 and above.

Table 4.97

Summary of One-way ANOVA for Differences between Keyboard Grades and Components of General Creativity

Source	Keyboard Grades	*Sum of Squares*	*df*	*Mean Square*	*F*	*p*
Figural Fluency	Between Groups Within Groups Total	566.65 21903.29 22469.94	4 154 158	141.66 142.23	1.00	.41
Figural Originality	Between Groups Within Groups Total	610.39 26082.79 26693.18	4 154 158	152.60 169.37	.90	.47
Figural Elaboration	Between Groups Within Groups Total	4539.76 35638.58 40178.34	4 154 158	1134.94 231.42	4.90	.00**
Figural Resist to Premature Closure	Between Groups Within Groups Total	1464.61 41899.78 43364.39	4 154 158	366.15 272.08	1.35	.26
Figural Abstractness of Title	Between Groups Within Groups Total	1434.56 69992.34 71426.91	4 154 158	358.64 454.50	.79	.53

Note. **significant at $p < .01$,

In summary, the results of ANOVA analyses between the five keyboard grades on general creativity and its components can be summarised as follows:

1. The trainee teachers with no keyboard grades scored significantly higher than the trainee teachers with keyboard grades on figural elaboration. This means that a trainee teacher who has no keyboard abilities is able to elaborating ideas (figural elaboration) better than the trainee teachers with keyboard grades.

2. There was no significant difference found between keyboard grades and figural fluency, figural originality, figural resistance to premature closure, and figural abstractness of title. This means that a trainee teacher who has high keyboard abilities is not necessarily able to produce ideas fluently (musical fluency), produce original ideas (musical originality), resist closure to an idea (musical resistance to premature closure), and produce an abstract title (musical abstractness of title).

4.12.2 The Relationship between General Creativity and Musical activity involvement

The correlation coefficient matrix in Table 4.98 shows the correlation between general creativity and musical activity involvement. Results indicate that the correlation index between these two variables ranged from .02 (figural abstractness of title) to .12 (figural fluency). There was no significant correlation in all the five components between general creativity and musical activity involvement. The data show that musical activity involvement had no relationship with all the components of general creativity. This means that general creativity is independent of musical activity involvement.

Table 4.98

Correlations Matrix of General Creativity with Musical activity involvement

General Creativity	*r*
Figural Fluency	.12
Figural Originality	.07
Figural Elaboration	-.03
Figural Resistance to Premature Closure	.10
Figural Abstractness of Title	.02
Creative Index	.12

Note. * Correlation is significant at the .05 level (2-tailed).

The results imply that the trainee teachers who participate in musical activities as choir, band, orchestra, recorder ensemble, caklempong, and private music lesson not necessarily are able to create ideas (figural fluency), create original ideas (figural originality), elaborate ideas (figural elaboration), resists premature closure to an idea (figural resistance to premature closure), and create abstract ideas (figural abstractness of title).

4.12.3 The Relationship between General Creativity and Aural Discrimination

Pearson product-moment correlations were computed to examine the correlation between components of general creativity and components of aural discrimination. The correlation results are shown in Table 4.99.

Results indicate that in term of creative index, it was found that there was no significant correlation between creative index and all of the five components of aural discrimination. In other words, general creativity is independent of aural discrimination.

Table 4.99

Correlational Analysis between General Creativity and Components of Aural Discrimination

Variables	Aural Discrimination						
	PIT	INT	MET	CAD	VIS	MODE	Total
General Creativity							
Creative Index	.07	.13	.09	.11	.03	.11	.12

Note.
PIT: Pitch Discrimination
INT: Interval Discrimination
MET: Meter Discrimination
CAD: Cadence Recognition
VIS: Aural and Visual Discrimination
MODE: Mode Recognition

Data in Table 4.100 show that the mean of the total scores of aural discrimination was significantly correlated with one of the five components of general creativity. There was a significant positive correlation between figural resistances of premature closure with aural discrimination ($r = .16, p < .01$). The correlation was very weak. This means that the trainee teachers who are creative in figural resistances of premature closure are likely to exhibit good results in Aural Discrimination. In other words, a trainee teacher who is able to resist closing to an idea until all the ideas are explored (figural resistances of premature closure) is likely to exhibit good results in aural discrimination test.

The data showed no significant correlation in the total mean score of aural discrimination among figural fluency, figural originality, figural elaboration, and the figural abstractness of title.

A detailed analysis of each component of general creativity and the components of aural discrimination revealed that of thirty correlations between components of general creativity and components of musical creativity only yield two significant results.

The first significant correlation was between figural fluency and interval discrimination ($r = .18, p < .01$). The correlation was positive and very weak. The second significant correlation was between figural originality and interval discrimination ($r = .17, p < .01$). Similarly, the correlation was also positive and very weak. Results suggest that the trainee teachers who exhibit good results in aural discrimination test are likely to be creative in figural fluency and figural originality. It means that a trainee teacher who exhibits the ability to hear distances between pitches (interval discrimination) will probably have the ability to produce many ideas (figural fluency) and has the ability to produce new ideas (figural originality).

However, other components of aural discrimination such as pitch discrimination, meter discrimination, cadence recognition, auditory-visual discrimination and mode discrimination had no influence towards general creativity and its components.

Table 4.100

Correlational Analysis between Components of General Creativity and Components of Aural Discrimination

Variables	Aural Discrimination						
	PIT	INT	MET	CAD	VIS	MODE	Total
General Creativity							
Figural Fluency	.04	.18*	.14	-.02	.03	.09	.12
Figural Originality	.06	.17*	.15	.13	.07	.15	.16
Figural Elaboration	.02	.03	-.11	.11	-.15	.08	.01
Figural Resistance to Premature Closure	.15	.11	.15	.05	.14	.05	.16*
Figural Abstractness of Title	-.02	-.01	-.08	.03	.02	-.09	-.02

Note. **Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).

PIT: Pitch Discrimination
INT: Interval Discrimination
MET: Meter Discrimination
CAD: Cadence Recognition
VIS: Aural and Visual Discrimination
MODE: Mode Recognition

4.12.4 The Relationship between General Creativity and Self-Esteem of Musical Ability

The correlation analysis between self-esteem in musical ability and components of general creativity using Pearson's correlation coefficient is shown in Table 4.101. The data indicate that the correlation index was not significant for all the five components of general creativity.

This means that the musical self-esteem in musical ability of the trainee teachers had no significant relationship with all the components in general creativity. The correlation was near zero. This could mean that the self-esteem of musical abilities of the trainee teachers did not influence their general creative abilities.

Table 4.101

Correlations Matrix of General Creativity with Self-Esteem of Musical Ability

General Creativity	*r*
Figural Fluency	-.04
Figural Originality	-.03
Figural Elaboration	.05
Figural Resistance to Premature Closure	.13
Figural Abstractness of Title	.03
Creative Index	.07

4.12.5 Summary of Results for Research Question Eleven

The results of the analysis of the relationships between general creativity with personal variables are summarised as follows:

1. Keyboard grades had no significant difference with general creativity. The trainee teachers who have good keyboard grades not necessary are figural creative. However, trainee teachers who have no grades in keyboard are more creative in figural elaboration than trainee teachers who have keyboard grades of grade 8 and above.
2. On the contrary, musical activity involvement had no correlation with general creativity and all of its components. This means that general creativity is independent of musical activity involvement.
3. There was no significant correlation between total scores of aural discrimination and general creativity. This means that a trainee teacher who exhibits good results in aural discrimination may not be figural creative.
4. Self-esteem of musical ability was no significantly correlated with general creativity and its components. This means that general creativity is independent of self-esteem of musical ability.

4.13 Data Analysis for Research Question Twelve

What are the predictors of creativity among the musical exposures?

Research question twelve investigated the predictors for creativity. The regression analyses were carried out to determine the relative strength of predictor variables in predicting musical creativity and general creativity.

The predictor variables were keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability. The criterion variables were musical creativity and general creativity and their components. Before performing the regression analysis the non-metric variables such as gender and socioeconomic status were transformed into dummy variables. Following that, all the variables were examined for accuracy of data entry, normality, linearity, homoscedasticity, and independence of errors prior to the regression analysis.

The regression coefficient (R^2) is the proportion of variation in the criterion variable that is explained by the predictor variables. It represents the collective contribution of all the variables in the prediction. Meanwhile, squared semi partial correlation (R^2 *change*) represents the proportion of variance of the criterion variable accounted for by a given predictor variable after another variable has been taken into account. In multiple regressions, the R^2 change represents this unique contribution (Chua, 2009; Hair et al., 2008).

In the regression analysis, first, the stepwise multiple regression was performed to determine the predictor of musical creativity and general creativity among the musical exposures. Then every component of musical creativity and general creativity were examined. Following that, a hierarchical multiple regression was conducted. This was to investigate whether by controlling personal variables, could the predictors i.e.

keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical creativity significantly predict musical creativity and general creativity.

4.13.1 Predictors of Musical Creativity among Musical Exposures

Table 4.102 displays the results of stepwise multiple linear regressions of predictor variables (keyboard grades, aural discrimination, musical activity involvement, and self-esteem of musical ability) on musical creativity.

The results reported that there were three predictors on musical creativity that were aural discrimination, self-esteem in musical ability, and keyboard grades.

Table 4.102 shows the correlation between musical creativity and the predictor variables. The overall correlation between the three predictor variables with criterion variables was .55. The R^2 value .23 in Model 1, shows that 23.0% (r = .48) changes in the criterion variable were caused by changes in the predictor variables, that is aural discrimination. Aural discrimination is the main factor in musical creativity. Model 2 shows the value of R^2 = .28 (r = .53). It shows that 28.0% of changes in the criterion variables were caused by the changes in the combination of predictor variables that are the aural discrimination and self-esteem in musical ability.

Keyboard grade was the third predictor of musical creativity. Model 3 revealed that the value of R^2 = .30 (r = .59) and that there were 30.0% of changes in the musical creativity is caused by the changes in the combination of the aural discrimination, self-esteem in musical ability, and keyboard grades. Together, the three predictor variables contributed to 30.0% (r = .59) changes of variants in the criterion variable of musical creativity.

However, the remaining 70.0% of the total variance of musical creativity were not accounted for.

Table 4.102

Model Summary of Predictors on Musical Creativity

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics R^2 Square	F Change	df1	df2	Sig. F Change
1	.48[a]	.23	.22	10.58	.23	46.06	1	157	.00***
2	.52[b]	.28	.27	10.28	.05	10.37	1	156	.00**
3	.55[c]	.30	.28	10.15	.02	5.00	1	155	.03*

Note. *significant at $p < .05$, **significant at $p < .01$,***significant at $p < .001$,

a Predictors: (Constant), Aural Discrimination
b Predictors: (Constant), Aural Discrimination Test, Self-esteem of Musical Ability
c Predictors: (Constant), Aural Discrimination Test, Self-esteem of Musical Ability, Keyboard Grades
Dependent Variable: Musical Creativity

Results from the ANOVA analysis in the regression model are presented in Table 4.103.

Table 4.103

Results of ANOVA for Predictors on Musical Creativity

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5156.06	1	5156.06	46.06	.00[a]
	Residual	17573.61	157	111.93		
	Total	22729.67	158			
2	Regression	6251.49	2	3125.75	29.59	.00[b]
	Residual	16478.18	156	105.63		
	Total	22729.67	158			
3	Regression	6766.06	3	2255.35	21.90	.00[c]
	Residual	15963.61	155	102.99		
	Total	22729.67	158			

a Predictors: (Constant), Aural Discrimination
b Predictors: (Constant), Aural Discrimination Test, Self-esteem
c Predictors: (Constant), Aural Discrimination Test, Self-esteem, Keyboard Grades
Dependent Variable: Musical Creativity

Results in Table 4.103 show that the three variables, aural discrimination, self-esteem of musical ability, and keyboard grades are significant predictor variables of musical creativity [$F(3, 155)= 21.90$, $p < .05$].

The Regression Model for Musical Creativity derived from the data is:

Musical Creativity = .36 (aural discrimination) + .24 (self-esteem) + .16 (keyboard grades)

The data in Table 4.104 indicate that the three variables, aural discrimination ($\beta = .36$, $p < .05$), self-esteem of musical ability ($\beta = .24$, $p < .05$), and keyboard grades ($\beta = .16$, $p < .05$) are significant factors of musical creativity. Together, the three predictor variables contributed to 30.0% ($r = .59$) changes of variants in the musical creativity [$F(3, 155) = 21.90$, $p < .05$]. It was found that musical activity involvement, is not a predictor of musical creativity.

Table 4.104

Standard Coefficients for Predictors on Musical Creativity

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	*t*	Sig.
1	(Constant)	3.09	5.81		.53	.60
	Aural Discrimination	.39	.06	.48	6.79	.00***
2	(Constant)	-12.29	7.40		-1.66	.10
	Aural Discrimination	.34	.06	.42	6.02	.00***
	Self-esteem	.16	.05	.23	3.22	.00**
3	(Constant)	-11.20	7.32		-1.53	.13
	Aural Discrimination	.29	.06	.36	4.85	.00***
	Self-esteem	.17	.05	.24	3.46	.00**
	Keyboard Grades	1.31	.59	.16	2.24	.03*

Note. *significant at $p < .05$, **significant at $p < .01$,***significant at $p < .001$,
Dependent Variable: Musical Creativity

4.13.2 Predictors of Components of Musical Creativity among Musical Exposures

The following are the results of multiple linear regression analysis on predictors (keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability) for components of musical creativity. The components of musical creativity are musical fluency, musical originality, musical elaboration, musical resistance to premature closure, musical abstractness of title, craftsmanship, musical syntax, musical sensitivity, and repetition of song.

4.13.2.1 Predictors of Musical Fluency among Musical Exposures

Table 4.105 displays the results of stepwise multiple linear regressions of predictor factors (keyboard grades, aural discrimination, musical activity involvement, and self-esteem of musical ability) on musical fluency.

The results show that there are two predictors on musical fluency that are aural discrimination and self-esteem of musical ability.

Table 4.105 shows the correlation between the criterion variables and the predictor variables. The overall correlation between the two predictor variables with criterion variables was .44. The R^2 value .17 in Model 1, shows that 17.0% (r = .41) changes in the criterion variable were caused by changes in the predictor variables, that is aural discrimination. Aural discrimination is the main factor to musical fluency.

Model 2 shows the value of R^2 = .20 (r = .44). It shows that 20.0% of changes in the criterion variables were caused by the changes in the combination of predictor variables that are the aural discrimination and self-esteem of musical ability. The two predictor variables contributed to 20.0% (r = .44) changes of variants in the criterion variable of musical fluency.

However, the remaining 80.0% of the total variance of musical fluency were not accounted for.

Table 4.105

Model Summary of Predictors on Musical Fluency

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics R^2 Change	F Change	df1	df2	Sig. F Change
1	.41[a]	.17	.16	1.44	.17	31.86	1	157	.00***
2	.44[b]	.20	.19	1.42	.03	5.39	1	156	.02*

Note. *significant at $p < .05$, ***significant at $p < .001$,

a Predictors: (Constant), Aural Discrimination
b Predictors: (Constant), Aural Discrimination, Self-esteem of Musical Ability
Dependent Variable: Musical Fluency

The results of the ANOVA test analysis in the regression model in Table 4.106 shows that the two variables, aural discrimination and self-esteem of musical ability are significant predictor variables of musical fluency [$F(2, 156) = 19.05$, $p < .05$].

Table 4.106

Results of One-way ANOVA for Predictors on Musical Fluency

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	66.37	1	66.37	31.86	.000[a]
	Residual	327.11	157	2.08		
	Total	393.48	158			
2	Regression	77.30	2	38.65	19.05	.000[b]
	Residual	316.19	156	2.03		
	Total	393.48	158			

a Predictors: (Constant), Aural Discrimination
b Predictors: (Constant), Aural Discrimination, Self-esteem of Musical Ability
Dependent Variable: Musical Fluency

The Regression Model for Musical Fluency derived from the data is:

Musical Fluency = .37 (aural discrimination) + .17 (self-esteem of musical ability).

Table 4.107

Standard Coefficients for Predictors on Musical Fluency

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	*t*	Sig.
1	(Constant)	-.31	.79		-.39	.70
	Aural Discrimination	.04	.01	.41	5.64	.00***
2	(Constant)	-1.84	1.03		-1.79	.08
	Aural Discrimination	.04	.01	.37	5.01	.00***
	Self-Esteem of Musical Ability	.02	.01	.17	2.31	.02*

Note. *significant at $p < .05$, ***significant at $p < .001$,

Dependent Variable: Musical Fluency

The data in Table 4.107 indicate that the two variables, aural discrimination ($\beta = .37$, $p < .05$) and self-esteem of musical ability ($\beta = .17$, $p < .05$) are significant factors of musical fluency. The two predictor variables contributed to 20.0% ($r = .44$) changes of variants in the musical fluency [$F(2, 156) = 19.05$, $p < .05$]. The other predictor variables that are musical activity involvement and keyboard grades are not factors for musical fluency.

4.13.2.2 Predictors of Musical Originality among Musical Exposures

Table 4.108 displays the results of stepwise multiple linear regressions of predictor factors (keyboard grades, aural discrimination, musical activity involvement, and self-esteem of musical ability) on musical originality.

The results show that there are two predictors on musical originality that are aural discrimination and self-esteem of musical ability.

Table 4.108 shows the correlation between the musical originality and the predictor variables. The overall correlation between the two predictor variables with criterion variables was .39. The R^2 value .100 in Model 1, shows that 10.0% (r = .32) changes in the criterion variable were caused by changes in the predictor variables, that is aural discrimination. Aural discrimination is the main factor to musical originality.

Table 4.108

Model Summary of Predictors on Musical Originality

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics R^2 Change	F Change	df1	df2	Sig. F Change
1	.32[a]	.10	.10	1.55	.10	17.50	1	157	.00***
2	.39[b]	.16	.14	1.51	.06	10.14	1	156	.00**

Note. **significant at $p < .01$,***significant at $p < .001$,

a Predictors: (Constant), Aural Discrimination
b Predictors: (Constant), Aural Discrimination, Self-Esteem of Musical Ability
Dependent Variable: Musical Originality

Model 2 shows the value of R^2=.16 (r = .39). It shows that 16.0% of changes in the criterion variables were caused by the changes in the combination of predictor variables that are the aural discrimination and self-esteem of musical ability. The two predictor variables contributed to 16.0% (r = .39) changes of variants in the criterion variable of musical originality.

However, the remaining 84.0% of the total variance of musical originality were not accounted for.

The results of the ANOVA analysis in the regression model in Table 4.109 shows that the two variables, aural discrimination and self-esteem of musical ability, are significant predictor variables of musical originality [$F(2, 156) = 14.33, p < .05$].

Table 4.109

Results of ANOVA for Predictors on Musical Originality

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	41.96	1	41.96	17.50	.000[a]
	Residual	376.46	157	2.40		
	Total	418.42	158			
2	Regression	72.28	2	32.47	14.33	.000[b]
	Residual	346.14	156	2.27		
	Total	418.42	158			

a Predictors: (Constant), Aural Discrimination
b Predictors: (Constant), Aural Discrimination, Self-Esteem of Musical Ability
Dependent Variable: Musical Originality

The Regression Model for Musical Originality derived from the data is:

Musical Originality = .26 (aural discrimination) +.24 (self-esteem).

The data in Table 4.110 indicate that the two variables, aural discrimination (β - = .26, $p < .05$), and self-esteem ($\beta = .24$, $p < .05$) are significant factors of musical originality. Togther, the two predictor variables contributed to 16.0% ($r = .39$) changes of variants in the musical originality [$F(2, 156) = 14.328, p < .05$]. It was found that the other predictor variables, keyboard grades and musical activity involvement, are not factors for musical originality.

Table 4.110

Standard Coefficients for Predictors on Musical Originality

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	*t*	Sig.
1	(Constant)	.31	.85		.36	.72
	Aural Discrimination	.04	.01	.32	4.18	.00***
2	(Constant)	-1.92	1.08		-1.77	.08
	Aural Discrimination	.03	.01	.26	3.43	.00**
	Self-Esteem	.02	.01	.24	3.18	.00*

Note. *significant at $p < .05$, **significant at $p < .01$,***significant at $p < .001$,

Dependent Variable: Musical Originality

4.13.2.3 Predictors of Musical Elaboration among Musical Exposures

Table 4.111 displays the results of stepwise multiple linear regressions of predictor factors (keyboard grades, aural discrimination, musical activity involvement, and self-esteem of musical ability) on musical elaboration.

The results show that there is only one predictor on musical elaboration that is aural discrimination.

Table 4.111 shows the correlation between musical elaboration and the predictor variable. The correlation between the predictor variable with criterion variables was .42. The R^2 value .17 in Model 1, shows that 17.2% (r = .42) changes in the musical elaboration were caused by changes in the aural discrimination. Aural discrimination is the main factor to musical elaboration. Aural discrimination contributed to 17.0% (r = .42) changes of variants in the criterion variable of musical elaboration.

However, the remaining 83.0% of the total variance of musical elaboration were not accounted for.

Table 4.111

Model Summary of Predictors on Musical Elaboration

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics R^2 Change	F Change	df1	df2	Sig. F Change
1	.42[a]	.17	.17	1.59	.17	32.62	1	157	.00***

Note. ***significant at $p < .001$,

a Predictors: (Constant), Aural Discrimination
Dependent Variable: Musical Elaboration

The results of the ANOVA analysis in the regression model in Table 4.112 shows that aural discrimination is a significant predictor variable of musical elaboration [$F(1, 157) = 32.62$, $p < .05$].

Table 4.112

Results of ANOVA for Predictors on Musical Elaboration

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	82.9	1	82.91	32.62	.000[a]
	Residual	399.02	157	2.54		
	Total	481.93	158			

a Predictors: (Constant), Aural Discrimination
Dependent Variable: Musical Elaboration

The Regression Model for Musical Elaboration derived from the data is:

Musical Elaboration = .42 (aural discrimination)

The data in Table 4.113 indicate that aural discrimination ($\beta = .42$, $p < .05$) is a significant predictor of musical elaboration. It contributed to 17.0% ($r = .42$) changes of variants in the musical elaboration [$F(1, 156) = 32.62$, $p < .05$]. It was found that the other variables (keyboard grades, musical activity involvement, and self-esteem of musical ability) are not predictor factors of musical elaboration.

Table 4.113

Standard Coefficients for Predictors on Musical Elaboration

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	*t*	Sig.
1	(Constant)	-1.03	.88		-1.18	.24
	Aural Discrimination	.05	.01	.42	5.71	.00***

Note. ***significant at $p < .001$,

Dependent Variable: Musical Elaboration

4.13.2.4 Predictors of Musical Resistance to Premature Closure among Musical Exposures

Table 4.114 presents the results of stepwise multiple linear regressions of predictor factors (keyboard grades, aural discrimination, musical activity involvement, and self-esteem of musical ability) on musical resistance to premature closure.

The results show that there are two predictors of musical resistance to premature closure that are aural discrimination and self-esteem of musical ability.

Table 4.114 shows the correlation between the musical resistance to premature closure and the predictor variables. The overall correlation between the predictor variables with criterion variables was .47. The R^2 value .20 in Model 1, shows that 20.0% (r = .44) changes in the criterion variable were caused by changes in the predictor variables, that is aural discrimination.

Table 4.114

Model Summary of Predictors on Musical Resistance to Premature Closure

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics R^2 Change	F Change	df1	df2	Sig. F Change
1	.44[a]	.20	.19	1.36	.20	38.11	1	157	.00***
2	.47[b]	.23	.21	1.34	.03	5.77	1	156	.01*

Note. *significant at $p < .05$, ***significant at $p < .001$,

a Predictors: (Constant), Aural Discrimination
b Predictors: (Constant), Aural Discrimination, Self-Esteem of Musical Ability
Dependent Variable: Musical Resistance to Premature Closure

Aural discrimination is the main factor for musical resistance to premature closure. Model 2 shows the value of $R^2 = .23$ ($r = .47$). It shows that 23.0% of changes in the criterion variables were caused by the changes in the combination of predictor variables that are the aural discrimination and self-esteem of musical ability. Together, the two predictor variables contributed to 23.0% ($r = .47$) changes of variants in the criterion variable of musical resistance to premature closure.

However, the remaining 77.0% of the total variance of musical resistance to premature closure were not accounted for.

The results of the ANOVA analysis in the regression model in Table 4.115 shows that the two predictors that are aural discrimination and self-esteem of musical ability are significant predictor variables of musical resistance to premature closure [$F(2, 156) = 22.52$, $p < .05$].

The Regression Model for Musical Resistance to Premature Closure derived from the data is:

Musical Resistance to Premature Closure = .40 (aural discrimination) +.17 (self-esteem of musical ability).

Table 4.115

Results of ANOVA for Predictors on Musical Resistance to Premature Closure

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	70.10	1	70.10	38.12	.000[a]
	Residual	288.81	157	1.84		
	Total	358.91	158			
2	Regression	80.40	2	40.20	22.52	.000[b]
	Residual	278.51	156	1.79		
	Total	358.91	158			

a Predictors: (Constant), Aural Discrimination
b Predictors: (Constant), Aural Discrimination, Self-Esteem
Dependent Variable: Musical Resistance to Premature Closure

The data in Table 4.116 indicate that the two variables, aural discrimination (β = .40, $p < .05$) and self-esteem of musical ability ($\beta = .17$, $p < .05$), are significant factors of musical resistance to premature closure. The two predictor variables contributed to 23.0% ($r = .47$) changes of variants in the musical resistance to premature closure [$F(2, 156) = 22.52$, $p < .05$]. The other predictor variables, keyboard grades and musical activity involvement, are not factors for musical resistance to premature closure.

Table 4.116

Standard Coefficients for Predictors on Musical Resistance to Premature Closure

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.82	.75		-1.10	.27
	Aural Discrimination	.05	.01	.44	6.17	.00***
2	(Constant)	-2.31	.96		-2.40	.01*
	Aural Discrimination	.04	.01	.40	5.52	.00***
	Self-Esteem	.02	.01	.17	2.40	.01*

Note. *significant at $p < .05$, ***significant at $p < .001$,

Dependent Variable: Musical Resistance to Premature Closure

4.13.2.5 Predictors of Musical Abstractness of Title among Musical Exposures

Table 4.117 displays the results of stepwise multiple linear regressions of predictor factors (keyboard grades, aural discrimination, musical activity involvement, and self-esteem of musical ability) on the musical abstractness of title.

The results show that self-esteem is a predictor on the musical abstractness. Table 4.117 shows the correlation between the musical abstractness of title and the predictor variable. The overall correlation between the predictor variables with criterion variables was .21. The R^2 value .05 in Model 1, shows that 5.0% (r = .21) changes in the criterion variable were caused by changes in the predictor variables, that is self-esteem of musical ability. Self-esteem of musical ability is the main factor to the musical abstractness of title. However, the remaining 95.0% of the total variance of musical abstractness of title was not accounted for.

Table 4.117

Model Summary of Predictors on Musical Abstractness of Title

Model	*R*	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics R^2 Change	F Change	df1	df2	Sig. F Change
1	.21[a]	.05	.04	1.07	.05	7.35	1	157	.00**

Note. **significant at $p < .01$

a Predictors: (Constant), Self-Esteem of Musical Ability
Dependent Variable: Musical Abstractness of Title

The results of the ANOVA analysis in the regression model in Table 4.118 shows that there are two significant predictor variables of musical abstractness of title [$F(1, 157) = 7.35$, $p < .05$]. The predictor is self-esteem of musical ability.

Table 4.118

Results of ANOVA for Predictors on Musical Abstractness of Title

	Model	Sum of Squares	df	Mean Square	*F*	Sig.
1	Regression	8.39	1	8.39	7.35	.007[a]
	Residual	179.12	157	1.14		
	Total	187.51	158			

a Predictors: (Constant), Self-Esteem of Musical Ability
Dependent Variable: Musical Abstractness of Title

The Regression Model for Musical Abstractness of Title derived from the data is:

Musical Abstractness of Title = .21 (self-esteem).

Table 4.119

Standard Coefficients for Predictors on Musical Abstractness of Title

	Model	Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	*t*	Sig.
1	(Constant)	3.02	.63		4.82	.00***
	Self-esteem	.01	.01	.21	2.71	.00**

Note. **significant at $p < .01$,***significant at $p < .001$,

Dependent Variable: Musical Abstractness of Title

The data in Table 4.119 indicate that self-esteem ($\beta = .22$, $p < .05$) and figural fluency ($\beta = .21$, $p < .05$), are significant factor of musical abstractness of title. The predictor variables contributed to 5.0% ($r = .21$) changes of variants in the musical abstractness of title [$F(1, 157) = 7.35$, $p < .05$]. The other predictor variables (keyboard grades, musical activity involvement, and aural discrimination) are not factors for musical abstractness of title.

4.13.2.6 Predictors of Craftsmanship among Musical Exposures

Table 4.120 displays the results of stepwise multiple linear regressions of predictor factors (keyboard grades, aural discrimination, musical activity involvement, and self-esteem of musical ability) on craftsmanship.

The results show that there are three predictors on craftsmanship that are aural discrimination, keyboard grades, and self-esteem of musical ability of the trainee teachers.

Table 4.120 shows the correlation between the craftsmanship and the predictor variables. The overall correlation between the three predictor variables with criterion variables was .55. The R^2 value .21 in Model 1, shows that 21.0% (r = .46) changes in the criterion variable were caused by changes in the predictor variables, that is aural discrimination. Aural discrimination is the main factor to craftsmanship. Model 2 shows the value of R^2 = .26 (r = .51). It shows that 26.0% of changes in the criterion variables were caused by the changes in the combination of predictor variables that are the aural discrimination and keyboard grades.

Model 3 shows that the value of R^2 = .31 (r = .55). The R^2 value in Model 3 shows that 31.0% of changes in the craftsmanship were caused by the changes in the combination of aural discrimination, keyboard grads, and self-esteem of musical ability.

Together, the five predictor variables contributed to 31.0% (r = .55) changes of variants in the criterion variable of craftsmanship.

However, the remaining 70.0% of the total variance of craftsmanship were not accounted for.

Table 4.120

Model Summary of Predictors on Craftsmanship

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics R^2 Change	F Change	df1	df2	Sig. F Change
1	.46[a]	.21	.20	1.41	.21	41.07	1	157	.00***
2	.51[b]	.26	.25	1.37	.05	10.56	1	156	.00**
3	.55[c]	.31	.29	1.33	.05	10.00	1	155	.00**

Note. **significant at $p < .01$,***significant at $p < .001$,

a Predictors: (Constant), Aural Discrimination
b Predictors: (Constant), Aural Discrimination, Keyboard Grades
c Predictors: (Constant), Aural Discrimination, Keyboard Grades, Self-esteem of Musical Ability
Dependent Variable: Craftsmanship

The results of the ANOVA analysis in the regression model in Table 4.121 shows there are three significant predictor variables of craftsmanship [$F(3, 155) = 22.42$, $p < .05$]. The three significant predictors are aural discrimination, keyboard grades, and self-esteem of musical ability.

Table 4.121

Results of ANOVA for Predictors on Craftsmanship

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	81.36	1	81.36	41.07	.000[a]
	Residual	311.02	157	1.98		
	Total	392.39	158			
2	Regression	101.08	2	50.54	27.07	.000[b]
	Residual	291.30	156	1.86		
	Total	392.39	158			
3	Regression	118.74	3	39.58	22.42	.000[c]
	Residual	273.64	155	1.76		
	Total	392.39	158			

a Predictors: (Constant), Aural Discrimination
b Predictors: (Constant), Aural Discrimination, Keyboard Grades
c Predictors: (Constant), Aural Discrimination, Keyboard Grades, Self-esteem of Musical Ability
Dependent Variable: Craftsmanship

The Regression Model for Craftsmanship derived from the data is:

Craftsmanship = .31 (aural discrimination) + .26 (keyboard grades) + .22 (self-esteem of musical ability).

The data in Table 4.122 indicate that the three variables, aural discrimination (β = .31, $p < .05$), keyboard grades (β = .26, $p < .05$), and self-esteem of musical ability (β = .22, $p < .05$), are significant factors of craftsmanship. Together, the three predictor variables contributed to 31.0% ($r = .55$) changes of variants of the craftsmanship [$F(3, 155) = 22.42$, $p < .05$]. Musical activity involvement, the other variable, is not a predictor factor of musical craftsmanship.

Table 4.122

Standard Coefficients for Predictors on Craftsmanship

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	*t*	Sig.
1	(Constant)	-.67	.77		-.87	.39
	Aural Discrimination	.04	.01	.45	6.41	.00***
2	(Constant)	-.26	.76		-.35	.73
	Aural Discrimination	.03	.01	.37	5.01	.00***
	Keyboard Grades	.25	.07	.24	3.25	.00**
3	(Constant)	-2.19	.95		-2.29	.02*
	Aural Discrimination	.03	.01	.31	4.18	.00***
	Keyboard Grades	.27	.07	.26	3.62	.00***
	Self-Esteem	.02	.01	.22	3.16	.00**

Note. *significant at $p < .05$, **significant at $p < .01$,***significant at $p < .001$,

Dependent Variable: Craftsmanship

4.13.2.7 Predictors of Musical Syntax among Musical Exposures

Table 4.123 displays the results of stepwise multiple linear regressions of predictor factors (keyboard grades, aural discrimination, musical activity involvement, and self-esteem of musical ability) on musical syntax.

The results show that there are three predictors on musical syntax are aural discrimination, self-esteem of musical ability, and keyboard grades.

Table 4.123 shows the correlation between the musical syntax and the predictor variables. The overall correlation between the three predictor variables with criterion variables was .52. The R^2 value .18 in Model 1, shows that 18.0% (r = .43) changes in the criterion variable were caused by changes in the predictor variables, that is aural discrimination. Aural discrimination is the main factor to musical syntax. Model 2 shows the value of R^2 = .23 (r = .48). It shows that 23.0% of changes in the criterion variables were caused by the changes in the combination of predictor variables which are the aural discrimination and self-esteem of musical ability.

Model 3 shows that the value of R^2 = .27 (r = .52). The R^2 value in Model 3 shows that there 27.0% of changes in the musical syntax were caused by the changes in the combination of aural discrimination, self-esteem, and keyboard grades. Together, the three predictor variables contributed to 27.0% (r = .52) changes of variants in the criterion variable of musical syntax.

However, the remaining 73.0% of the total variance of musical syntax were not accounted for.

The results from the ANOVA analysis in the regression model in Table 4.124 shows that the three variables, aural discrimination, self-esteem, and keyboard grades are significant predictor variables of musical syntax [$F(3, 155) = 19.21, p < .05$].

Table 4.123

Model Summary of Predictors on Musical Syntax

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics R^2 Change	F Change	df1	df2	Sig. F Change
1	.43[a]	.18	.18	1.45	.18	35.47	1	157	.00***
2	.48[b]	.23	.22	1.41	.05	9.62	1	156	.00**
3	.52[c]	.27	.26	1.38	.04	8.38	1	155	.00**

Note. **significant at $p < .01$,***significant at $p < .001$,

a Predictors: (Constant), Aural discrimination
b Predictors: (Constant), Aural discrimination, Self-esteem
c Predictors: (Constant), Aural discrimination, Self-esteem, Keyboard grades
Dependent Variable: Musical Syntax

Table 4.124

Results of ANOVA for Predictors on Musical Syntax

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	74.64	1	74.64	35.46	.000[a]
	Residual	330.42	157	2.10		
	Total	405.06	158			
2	Regression	93.83	2	46.91	23.51	.000[b]
	Residual	311.23	156	1.99		
	Total	405.06	158			
3	Regression	109.80	3	36.60	19.21	.000[c]
	Residual	295.26	155	1.90		
	Total	405.06	158			

a Predictors: (Constant), Aural discrimination
b Predictors: (Constant), Aural discrimination, Self-esteem
c Predictors: (Constant), Aural discrimination, Self-esteem, Keyboard grades
Dependent Variable: Musical Syntax

The Regression Model for Musical Syntax derived from the data is:

Musical Syntax = .30 (aural discrimination) + .24 (self-esteem) + .21 (keyboard grades).

Table 4.125

Standard Coefficients for Predictors on Musical Syntax

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	*t*	Sig.
1	(Constant)	-.54	.79		-.68	.50
	Aural discrimination	.04	.01	.43	5.96	.00***
2	(Constant)	-2.57	1.02		-2.53	.01
	Aural discrimination	.04	.01	.38	5.21	.00***
	Self-esteem	.02	.01	.22	3.10	.00**
3	(Constant)	-2.38	.99		-2.40	.02*
	Aural discrimination	.03	.01	.30	3.89	.00***
	Self-esteem	.02	.01	.24	3.43	.00**
	Keyboard grades	.23	.08	.21	2.70	.00**

Note. *significant at $p < .05$, **significant at $p < .01$,***significant at $p < .001$,

Dependent Variable: Musical Syntax

The data in Table 4.125 indicate that the three variables, aural discrimination ($\beta = .30$, $p < .05$), self-esteem ($\beta = .24$ $p < .05$), and keyboard grades ($\beta = .21$, $p < .05$), are significant factors of musical syntax. Together, the three predictor variables contributed to 27.0% ($r = .52$) changes of variants in the musical syntax [$F(3, 155) = 19.21$, $p < .05$].

It was found that musical activity involvement, the other variable, is not a predictor factor of musical syntax.

4.13.2.8 Predictors of Musical Sensitivity among Musical Exposures

Table 4.126 displays the results of stepwise multiple linear regressions of predictor factors (keyboard grades, aural discrimination, musical activity involvement, and self-esteem of musical ability) on musical sensitivity.

The results show that there are three predictors of musical sensitivity. They are aural discrimination, keyboard grades, and self-esteem of musical ability.

Table 4.126 shows the correlation between the musical sensitivity and the predictor variables. The overall correlation between the three predictor variables with criterion variables was .54. The R^2 value .23 in Model 1, shows that 23.0% (r = .48) changes in the criterion variable were caused by changes in the predictor variables, that is aural discrimination. Aural discrimination is the main factor to musical sensitivity.

Model 2 shows the value of R^2 = .26 (r = .51). It indicates that 26.0% of changes in the criterion variables were caused by the changes in the combination of predictor variables comprising aural discrimination and keyboard grades. Model 3 shows that the value of R^2 = .29 (r = .54). The R^2 value in Model 3 shows that there 29.0% of changes in the musical sensitivity were caused by the changes in the combination of aural discrimination, keyboard grads, and self-esteem of musical ability.

Together, the three predictor variables contributed to 29.0% (r = .54) changes of variants in the criterion variable of musical sensitivity. However, the remaining 71.0% of the total variance of musical sensitivity were not accounted for.

Table 4.126

Model Summary of Predictors on Musical Sensitivity

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics R^2 Change	F Change	df1	df2	Sig. F Change
1	.48[a]	.23	.29	1.49	.23	47.64	1	157	.00***
2	.51[b]	.26	.25	1.47	.03	5.50	1	156	.02*
3	.54[c]	.29	.27	1.44	.03	6.33	1	155	.01*

Note. *significant at $p < .05$, ***significant at $p < .001$,

a Predictors: (Constant), Aural discrimination
b Predictors: (Constant), Aural discrimination, Keyboard Grades
c Predictors: (Constant), Aural discrimination, Keyboard Grades, Self-esteem of Musical Ability
Dependent Variable: Musical Sensitivity

The results of the ANOVA analysis in the regression model in Table 4.127 shows that the four variables, aural discrimination, figural abstractness of title, keyboard grades, and self-esteem are significant predictor variables of musical sensitivity [$F(3, 155) = 20.89$, $p < .05$].

Table 4.127

Results of ANOVA for Predictors on Musical Sensitivity

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	105.43	1	105.44	47.64	.000[a]
	Residual	347.47	157	2.21		
	Total	452.91	158			
2	Regression	117.26	2	58.63	27.25	.000[b]
	Residual	335.65	156	2.15		
	Total	452.91	158			
3	Regression	130.42	3	43.47	20.89	.000[c]
	Residual	322.49	155	2.08		
	Total	452.91	158			

a Predictors: (Constant), Aural discrimination
b Predictors: (Constant), Aural discrimination, Keyboard Grades
c Predictors: (Constant), Aural discrimination, Keyboard Grades, Self-esteem of Musical Ability
Dependent Variable: Musical Sensitivity

The Regression Model for Musical Sensitivity derived from the data is:

Musical Sensitivity = .37 (aural discrimination) + .19 (keyboard skills) +
.18 (self-esteem of musical ability).

The data in Table 4.128 indicate that the four variables, aural discrimination ($\beta = .37$, $p < .05$), keyboard grades ($\beta = .19$, $p < .05$), and self-esteem of musical ability ($\beta = .18$, $p < .05$), are significant factors of musical sensitivity. Together, the three predictor variables contributed to 29.0% ($r = .54$) changes of variants in the musical sensitivity [$F(3, 155) = 20.89$, $p < .05$]. The other variable that is not a predictor factor of musical syntax is musical activity involvement.

Table 4.128

Standard Coefficients for Predictors on Musical Sensitivity

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	*t*	Sig.
1	(Constant)	-1.82	.81		-2.23	.03*
	Aural discrimination	.05	.01	.48	6.90	.00***
2	(Constant)	-1.50	.81		-1.85	.07
	Aural discrimination	.04	.01	.42	5.70	.00***
	Figural Abstractness of Title	.19	.08	.17	2.34	.02*
3	(Constant)	-3.17	1.04		-3.05	.00**
	Aural discrimination	.04	.01	.37	4.97	.00***
	Figural Abstractness of Title	.21	.08	.19	2.61	.01*
	Keyboard grades	.01	.01	.18	2.52	.01*

Note. *significant at $p < .05$, **significant at $p < .01$,***significant at $p < .001$,

Dependent Variable: Musical Sensitivity

4.13.2.9 Predictors of Repetition of Songs among Musical Exposures

Table 4.129 displays the results of stepwise multiple linear regressions of predictor factors (keyboard grades, aural discrimination, musical activity involvement, and self-esteem of musical ability) on repetition of song.

The results show that there is one predictor on repetition of songs that is aural discrimination.

Table 4.129 shows the correlation between the repetition of songs and the predictor variables. The correlation between the predictor variable with criterion variables was .18. The R^2 value .031 in Model 1, shows that 3.0% ($r = .18$) changes in the criterion variable were caused by changes in the predictor variables, that is aural discrimination. Hence, the aural discrimination contributed to 3.0% (r =.18) changes of variants in the criterion variable of repetition of song. However, the remaining 97.0% of the total variance of repetition of song were not accounted for.

Table 4.129

Model Summary of Predictors on Repetition of Song

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	R^2 Change	F Change	df1	df2	Sig. F Change
					Change Statistics				
1	.18[a]	.03	.03	.81	.03	5.08	1	157	.03*

Note. *significant at $p < .05$,

a Predictors: (Constant), Aural discrimination
Dependent Variable: Repetition of Song

The results of the ANOVA analysis in the regression model in Table 4.130 show that aural discrimination is significant predictor variables of repetition of song [$F(1, 157) = 5.08, p < .05$].

Table 4.130

Results of ANOVA for Predictors on Repetition of Song

Model		Sum of Squares	*df*	Mean Square	F	Sig.
1	Regression	3.35	1	3.35	5.08	.03[a]
	Residual	103.59	157	.66		
	Total	106.94	158			

a Predictors: (Constant), Aural discrimination
Dependent Variable: Musical Repetition of Song

The Regression Model for Repetition of Song derived from the data is:

Repetition of Song = .18 (aural discrimination)

Table 4.131

Standard Coefficients for Predictors on Repetition of Songs

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	*t*	Sig.
1	(Constant)	4.99	.45		11.17	.00***
	Aural discrimination	.01	.00	.18	2.25	.03*

Note. *significant at $p < .05$, ***significant at $p < .001$,

Dependent Variable: Repetition of Song

The data in Table 4.131 indicate that aural discrimination ($\beta = .18$, $p < .05$) is a significant factor of repetition of songs. It contributed to 3.0% ($r = .18$) changes of variants in the repetition of song [$F(1, 157) = 5.08$, $p < .05$]. The other variables which are not predictor factors of repetition of song are keyboard grades, musical activity involvement, and self-esteem of musical ability.

4.13.3 Summary of Predictors of Musical Creativity among Musical Exposures

The overall summary of the predictors for musical creativity and every component of musical creativity are shown in Table 4.132. The predictor variables were musical exposures (keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability).

As shown in Table 4.132, among the predictor variables, aural discrimination accounted for the greatest variance in predicting musical creativity. Aural discrimination is also the strongest predictor of eight of the nine components of musical creativity (musical fluency, musical originality, musical elaboration, musical resistance to premature closure, craftsmanship, musical syntax, musical sensitivity, and repetition of song).

Table 4.132

Summary of the Predictors of Musical Creativity among Musical Exposures

Criterion Variables	1st Predictor	2nd Predictor	3rd Predictor	Total Strength
Musical Creativity	Aural Discrimination 23.0%	Self-esteem of Musical Ability 5.0%	Keyboard Grades 2.0%	30.0%
Musical Fluency	Aural Discrimination 17.0%	Self-esteem of Musical Ability 3.0%		20.0%
Musical Originality	Aural Discrimination 10.0%	Self-esteem of Musical Ability 6.0%		16.0%
Musical Elaboration	Aural Discrimination 17.0%			17.0%
Musical Resistance to Premature Closure	Aural Discrimination 20.0%	Self-esteem of Musical Ability 3.0%		23.0%
Musical Abstractness of Title	Self-esteem of Musical Ability 5.0%			5.0%
Craftsmanship	Aural Discrimination 21.0%	Self-esteem of Musical Ability 5.0%	Keyboard Grades 5.0%	31.0%
Musical Syntax	Aural Discrimination 18.0%	Self-esteem of Musical Ability 5.0%	Keyboard Grades 4.0%	27.0%
Musical Sensitivity	Aural Discrimination 23.0%	Self-esteem of Musical Ability 3.0%	Keyboard Grades 3.0%	29.0%
Repetition of Song	Aural Discrimination 3.0%			3.0%

The next predictor after aural discrimination is self-esteem of musical creativity. Self-esteem is the second predictor of musical creativity. It is the strongest predictor of musical abstractness of title. It is also a predictor for musical fluency, musical originality, musical resistance to premature closure, craftsmanship, musical syntax, and musical sensitivity. However, the strength is weak. Keyboard grade is also a predictor of musical creativity. It is also the predictor of craftsmanship, musical syntax, and musical sensitivity.

4.13.4 Predictors of General Creativity among Musical Exposures

The results of stepwise multiple linear regressions of predictor factors (keyboard grades, aural discrimination, musical activity involvement, and self-esteem of musical ability) on general creativity show that there is no predictor on general creativity among the musical exposures.

4.13.5 Predictors of Components of General Creativity among Musical Exposures

The following are the results of multiple linear regression analysis on predictors (keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability) of components of general creativity. The components of general creativity are figural fluency, figural originality, figural elaboration, figural resistance to premature closure, and figural abstractness of title.

The regression analysis revealed that there are no predictors among the musical exposure variables on figural fluency, figural originality, and the figural abstractness of title. Thus, only figural elaboration and figural resistance to premature closure are presented.

4.13.5.1 Predictors of Figural Elaboration among Musical Exposures

Table 4.133 displays the results of stepwise multiple linear regressions of predictor factors (keyboard grades, aural discrimination, musical activity involvement, and self-esteem of musical ability) on figural elaboration.

The results show that keyboard grades is a predictor on figural elaboration.

Table 4.133 shows the correlation between the figural elaboration and the predictor variable. The overall correlation between the predictor variables with criterion variables was .21. The R^2 value .05 in Model 1, shows that 5.0% (r = .21) changes in the criterion variable were caused by changes in the predictor variables, that is keyboard grades. Keyboard grade is the main factor to figural elaboration. However, the remaining 95.0% of the total variance of figural elaboration were not accounted for.

Table 4.133

Model Summary of Predictors on Figural Elaboration

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics R^2 Change	F Change	df1	df2	Sig. F Change
1	.21[a]	.05	.04	15.63	.05	7.45	1	157	.00**

*Note.***significant at $p < .01$

a Predictors: (Constant), Keyboard Grades
Dependent Variable: Figural Elaboration

The results of the ANOVA analysis in the regression model in Table 4.134 shows that there is one significant predictor variable of figural elaboration [$F(1, 157) = 7.45$, $p < .05$]. The predictor is keyboard grades.

Table 4.134

Results of ANOVA for Predictors on Figural Elaboration

	Model	Sum of Squares	df	Mean Square	*F*	Sig.
1	Regression	1819.14	1	1819.14	7.45	.007[a]
	Residual	38359.20	157	244.33		
	Total	40178.34	158			

a Predictors: (Constant), Keyboard Grades
Dependent Variable: Figural Elaboration

The Regression Model for Figural Elaboration derived from the data is:

Figural Elaboration = .21 (keyboard grades).

Table 4.135

Standard Coefficients for Predictors on Figural Elaboration

	Model	Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	*t*	Sig.
1	(Constant)	102.46	2.11		48.66	.00***
	Keyboard Grades	-2.29	.84	-.21	-2.73	.00**

Note. **significant at $p < .01$,***significant at $p < .001$,

Dependent Variable: Figural Elaboration

The data in Table 4.135 indicate that keyboard grades ($\beta = -.21$, $p < .05$) is a significant factor of figural elaboration. The predictor variable contribute to 5.0% ($r = .21$) changes of variants in the figural elaboration [$F(1, 157) = 7.45$, $p < .05$]. The other predictor variables (musical activity involvement, aural discrimination, and self-esteem of musical ability) are not factors for figural elaboration.

4.13.5.2 Predictors of Figural Resistance to Premature Closure among Musical Exposures

Table 4.136 displays the results of stepwise multiple linear regressions of predictor factors (keyboard grades, aural discrimination, musical activity involvement, and self-esteem of musical ability) on figural resistance to premature closure.

The results show that there is a predictor of figural resistance to premature closure. That predictor is aural discrimination.

Table 4.136 shows the correlation between the figural resistance to premature closure and the predictor variable. The overall correlation between the predictor variables with criterion variables was .16. The R^2 value .03 in Model 1, shows that 3.0% (r = .16) changes in the criterion variable were caused by changes in the predictor variable, that is aural discrimination.

Table 4.136

Model Summary of Predictors on Figural Resistance to Premature Closure

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics R^2 Change	F Change	df1	df2	Sig. F Change
1	.16[a]	.03	.02	16.41	.03	4.04	1	157	.05*

Note. *significant at $p < .05$,

a Predictors: (Constant), Aural Discrimination
Dependent Variable: Figural Resistance to Premature Closure

Aural discrimination is the main factor to figural resistance to premature closure. However, the remaining 97.0% of the total variance of figural resistance to premature closure were not accounted for.

The results of the ANOVA analysis in the regression model in Table 4.137 shows that there is one significant predictor variable of figural resistance to premature closure [$F(1, 157) = 4.04$, $p < .05$]. The predictor is aural discrimination.

Table 4.137

Results of ANOVA for Predictors on Figural Resistance to Premature Closure

	Model	Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	1087.04	1	1087.04	4.04	.046[a]
	Residual	42277.35	157	269.28		
	Total	43364.39	158			

a Predictors: (Constant), Aural Discrimination
Dependent Variable: Figural Resistance to Premature Closure

The Regression Model for Figural Resistance to Premature Closure derived from the data is:

Figural Resistance to Premature Closure = .16 (aural discrimination).

Table 4.138

Standard Coefficients for Predictors on Figural Resistance to Premature Closure

	Model	Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	*t*	Sig.
1	(Constant)	88.84	9.02		9.85	.00***
	Keyboard Grades	.18	.09	.16	2.01	.05*

Note. *significant at $p < .05$, ***significant at $p < .001$,

Dependent Variable: Figural Elaboration

The data in Table 4.138 indicate that aural discrimination ($\beta = .16$, $p < .05$) is a significant factor of figural resistance to premature closure. The predictor variable contributed to 3.0% ($r = .16$) changes of variants in the figural resistance to premature closure [$F(1, 157) = 4.04$, $p < .05$]. The other predictor variables (musical activity involvement, keyboard grades, and self-esteem of musical ability) are not factors for figural resistance to premature closure.

4.13.6 Summary of Predictors of General Creativity among Musical Exposures

The overall summary of the predictors for general creativity and every component of general creativity are shown in Table 4.139. The predictor variables are musical exposures (keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability).

Table 4.139

Summary of the Predictors of General Creativity among Musical Exposures

Criterion Variables	1st Predictor	Total Strength
Figural Creativity	No predictor	-
Figural Fluency	No predictor	-
Figural Originality	No predictor	-
Figural Elaboration	Keyboard Grades 5.0%	5.0%
Figural Resistance to Premature Closure	Aural Discrimination 3.0%	3.0%
Figural Abstractness of Title	No predictor	-

As shown in Table 4.139, musical exposure variables are not a strong predictor of general creativity and the components of general creativity. Musical exposures variables are predictor for figural elaboration and figural resistance to premature closure. However, they are not predictors of general creativity, figural fluency, figural originality, and figural abstractness of title.

Keyboard grade is the only predictor of figural elaboration and aural discrimination is the only predictor of figural resistance to premature closure. The predictor variables can be characterised as very weak.

4.13.7 Predictors of Musical Creativity among Musical Exposures with Moderated Personal Variables

Table 4.140 presents the results of the hierarchical multiple linear regression analysis of predictor factors (aural discrimination, academic grades, and components of general creativity) on musical creativity. The personal variables e.g. gender, ethnicity, academic years, and socioeconomic status were controlled in the analysis.

Table 4.140 displays the results of hierarchical stepwise multiple linear regressions of predictor variables (keyboard grades, aural discrimination, musical activity involvement, and self-esteem of musical ability) with controlled personal variables (gender, ethnicity, academic years, and socioeconomic status) on musical creativity.

The results show that there are three predictors on musical creativity that are aural discrimination, self-esteem in musical ability, and keyboard grades.

Table 4.140 shows the correlation between musical creativity and the predictor variables. The overall correlation between the three predictor variables with criterion variables was .61. The R^2 value .54 in Model 2, shows that 29.0% (r = .54) changes in the criterion variable were caused by changes in the predictor variables, that is aural discrimination. Aural discrimination is the main factor in musical creativity. Model 3 shows the value of R^2 = .33 (r = .58). It shows that 33.0% of changes in the criterion variables were caused by the changes in the combination of predictor variables comprises the aural discrimination and self-esteem in musical ability.

Keyboard grade is the third predictor of musical creativity. Model 3 shows that the value of R^2 = .37 (r = .61) and that there are 37.0% of changes in the musical creativity were caused by the changes in the combination of the aural discrimination, self-esteem in musical ability, and keyboard grades. Together, the three predictor variables contributed to 37.0% (r = .61) changes of variants in the criterion variable of musical creativity. However, the remaining 63.0% of the total variance of musical creativity were not accounted for.

Table 4.140

Model Summary of Predictors on Musical Creativity with Moderated Personal Variables

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics R^2 Square	F Change	df1	df2	Sig. F Change
1	.25[a]	.06	.04	11.78	.06	2.48	1	157	.05*
2	.54[b]	.29	.27	10.26	.23	49.92	1	156	.00***
3	.58[c]	.33	.31	9.99	.04	9.42	1	155	.00**
4	.61[d]	.37	.34	9.74	.04	8.97	1	155	.00**

Note. *significant at $p < .05$, **significant at $p < .01$,***significant at $p < .001$,

a Predictors: (Constant), Academic Years, Gender, Socioeconomic Status, Ethnicity
b Predictors: (Constant), Aural Discrimination
c Predictors: (Constant), Aural Discrimination Test, Self-esteem of Musical Ability
d Predictors: (Constant), Aural Discrimination Test, Self-esteem of Musical Ability, Keyboard Grades
Dependent Variable: Musical Creativity

The results of the ANOVA analysis in the regression model in Table 4.141 shows that the three variables, aural discrimination, self-esteem of musical ability, and keyboard grades are significant predictor variables of musical creativity [$F(7, 151)$= 12.69, $p < .05$].

Table 4.141

Results of ANOVA for Predictors on Musical Creativity with Moderated Personal Variables

	Model	Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	1377.29	4	344.32	2.48	.05[a]
	Residual	21352.38	154	138.65		
	Total	22729.67	158			
2	Regression	6630.34	5	1326.07	12.60	.00[b]
	Residual	16099.33	153	105.22		
	Total	22729.67	158			
3	Regression	7569.59	6	1261.60	12.65	.00[c]
	Residual	15160.08	152	99.74		
	Total	22729.67	158			
4	Regression	8419.18	7	1202.74	12.69	.00[d]
	Residual	14310.50	151	94.77		
	Total	22729.67	158			

a Predictors: (Constant), Academic Years, Gender, Socioeconomic Status, Ethnicity
b Predictors: (Constant), Aural Discrimination
c Predictors: (Constant), Aural Discrimination Test, Self-esteem of Musical Ability
d Predictors: (Constant), Aural Discrimination Test, Self-esteem of Musical Ability, Keyboard Grades
Dependent Variable: Musical Creativity

The Regression Model for Musical Creativity derived from the data is:

Musical Creativity = -.05 (aural discrimination) + .36 (self-esteem) + .23 (keyboard grades)

The data in Table 4.142 indicate that the three variables, aural discrimination (β = -.05, $p < .05$), self-esteem of musical ability (β = .36, $p < .05$), and keyboard grades (β = .23, $p < .05$) are significant factors of musical creativity. Together, the three predictor variables contributed to 37.0% (r = .61) changes of variants in the musical creativity [$F(7, 151)$= 12.69, $p < .05$]. The other predictor variable that is musical activity involvement is not a predictor of musical creativity.

Table 4.142

Standard Coefficients for Predictors on Musical Creativity with Moderated Personal Variables

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	*t*	Sig.
1	(Constant)	50.66	5.53		9.16	.00***
	Gender	-5.31	2.15	-.21	-2.47	.02*
	Ethnicity	1.49	1.08	.12	1.38	.15
	Socioeconomic Status	1.62	2.10	.06	.77	.44
	Academic Years	-1.47	.88	-.13	-1.67	.10
2	(Constant)	13.36	7.15		1.87	.06
	Gender	-6.16	1.88	-.24	-3.29	.00**
	Ethnicity	1.15	.94	.09	1.23	.22
	Socioeconomic Status	.96	1.82	.04	.53	.60
	Academic Years	-1.30	.77	-.12	-1.70	.09
	Aural Discrimination	.39	.06	.48	7.07	.00***
3	(Constant)	-2.49	8.66		-.29	.76
	Gender	-6.13	1.83	-.24	-3.35	.00**
	Ethnicity	1.68	.93	.13	1.81	.07
	Socioeconomic Status	.29	1.79	.01	.16	.87
	Academic Years	-.98	.76	-.09	-1.30	.20
	Aural Discrimination	.35	.06	.43	6.26	.00***
	Self-esteem of Musical Ability	.16	.05	.22	3.07	.00**
4	Gender	.63	8.51		.07	.94
	Ethnicity	-7.49	1.84	-.29	-4.07	.00***
	Socioeconomic Status	1.27	.92	.10	1.38	.19
	Academic Years	.18	1.75	.01	.10	.92
	Aural Discrimination	-.57	.75	-.05	-.76	.45
	Self-esteem of Musical Ability	.29	.06	.36	4.96	.00***
	Keyboard Grades	.17	.05	.23	3.36	.00**

Note. *significant at $p < .05$, **significant at $p < .01$,***significant at $p < .001$,

Dependent Variable: Musical Creativity

The summary of the regression analysis shows that the results for predictors of musical creativity with moderated personal variables are similar to the results of regression without the moderated personal variables. It can be concluded that personal variables have no impact on the strength of the prediction between musical creativity and musical exposures.

4.13.8 Predictors of General Creativity among Musical Exposures with Moderated Personal Variables

The results of hierarchical stepwise multiple linear regressions of predictor factors (keyboard grades, aural discrimination, musical activity involvement, and self-esteem of musical ability) on general creativity show that there is no predictor on general creativity among the musical exposures with moderated personal variables.

This result is similar to the result of predictors of general creativity among musical exposures without the moderated personal variables. It can be concluded that musical exposures have no impact on general creativity.

4.13.9 Summary of Results for Research Question Twelve

The results of the analysis of predictors of musical creativity are summarised as follows:

1. The predictors of musical creativity are aural discrimination, self-esteem, and keyboard grades.
2. The predictors of musical fluency, musical originality, musical resistance to premature closure, are aural discrimination and self-esteem of musical ability.

   The predictor of musical elaboration and repetition of song is aural discrimination.

   The predictors of craftsmanship, musical syntax, and musical sensitivity are aural discrimination, self-esteem of musical ability, and keyboard grades.
3. After eliminating the personal variables, the predictors of musical creativity remain as aural discrimination, self-esteem of musical ability, and keyboard grades.

4. There is no predictor of general creativity among the musical exposure variables. However, the predictors for components of general creativity that is figural elaboration is keyboard grades, and figural resistance to premature closure is aural discrimination. The variables in musical exposures are not predictors of figural fluency, figural originality, and figural abstractness of title.

4.14 Summary

1. The musical exposures of the trainee teachers show that 63.5% of the trainee teachers do not have any keyboard grades. However, they were highly exposed to the choir (95.0%) and Gamelan (64.2%) activities. The trainee teachers also wre exposed to aural skills. Their aural discrimination skills were moderately high (77.9%). However, the majority of the trainee teachers (86.2%) had low and moderate self-esteem of musical ability.
2. For keyboard grades, female trainee teachers were more exposed to keyboard playing than male trainee teachers. Similarly, Chinese trainee teachers were more exposed to keyboard playing than other ethnicity. The year one trainee teachers were exposed more to keyboard skills than other academic year trainee teachers. However, socioeconomic status did not show significant differences in keyboard exposure.
3. For musical activity involvement, year four and year three trainee teachers were more exposed to musical activities compared to year two and year one trainee teachers. However, gender, ethnicity, and socioeconomic status of the trainee teachers did not influence their involvement in musical activities.
4. For aural discrimination skills, the Chinese trainee teachers and the year three trainee teachers had higher aural discrimination skills than the trainee teachers from other ethnic groups and academic years. However, gender and socioeconomic status of the trainee teachers did not influence their aural discrimination skills.
5. For self-esteem of musical ability, the trainee teachers show no significant differences in self-esteem of musical ability in terms of gender, ethnicity, academic years, and socioeconomic status.

6. The trainee teachers had moderate musical creativity (M = 42.14). Out of the four dimensions, the trainee teachers scored the highest in repetition of song and lowest in musical sensitivity. They show higher creativity in technical goodness than creative dimension. In creative dimension, the trainee teachers show high creativity in musical abstractness of title and musical fluency. They are less creative in musical originality and musical resistance to premature closure.

   The trainee teachers had moderately high general creativity (Creative index: M = 111.33, SD = 11.19). Out of the five components in general creativity, the trainee teachers scored higher in figural resistance to premature closure and figural fluency. They are less creative in figural elaboration and figural abstractness of title.

7. The musical creativity and general creativity of the trainee teachers are likely to be related (r = .21, p < .01). The trainee teachers who are creative in musical fluency are also creative in figural fluency (r = .17, p < .01). Similarly those who are creative in musical originality are also creative in figural originality (r = .16, p < .01). Trainee teachers who are creative in musical resistance to premature closure are also creative in figural resistance to premature closure (r = .16, p < .01). However, the correlations are very weak.

8. For musical creativity, gender and ethnicity showed significant differences in musical creativity. The male trainee teachers are significantly more creative in musical creativity than the female trainee teachers. The Chinese trainee teachers are significantly more creative in musical creativity than the Malay trainee teachers. However, academic years and socioeconomic status showed no significant differences in musical creativity. The academic years in the institutions and the socioeconomic status of the family did not influence musical creativity.

9. For general creativity, academic years showed significant differences in general creativity. The year two trainee teachers are more creative in general creativity compared to trainee teachers in year one. The year two trainee teachers are more creative in figural originality than trainee teachers in year two and year four. They are also more creative in figural elaboration than trainee teachers in year four. However, gender, ethnicity, and socioeconomic status did not influence their general creativity.

10. For the relationships between musical creativity and musical exposures, it was found that musical exposures such as keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability showed significant differences in musical creativity. This means that musical exposures influence musical creativity.

    Trainee teachers with grade 8 and above in keyboard grades are more creative in musical creativity than those without keyboard grades. The relationship between musical creativity and musical activity involvement are significant and positive (r = 19, $p < .05$). Similarly, the relationships between musical creativity and aural discrimination is significant and positive (r = 48, $p < .05$). As for self-esteem of musical ability, it is significantly related to musical creativity (r = 31, $p < .05$). However, all these correlations are weak.

11. For the relationships between general creativity and musical exposures, it was found that musical exposures such as keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability showed no significant differences in general creativity. This means that musical exposures do not influences general creativity.

12. Among the predictor variables (keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability), aural discrimination

accounted for the greatest variance in predicting musical creativity. As for general creativity, it was found that all the variables in musical exposures are not predictor of general creativity.

CHAPTER 5

SUMMARY, DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

5.1 Summary of the Study

This study is based on the premise derived from the System Model of Creativity by Mihaly Csikszentmihalyi that creativity results from the dynamic operation between three elements namely culture, field, and person. The element culture refers to the knowledge shared by the society that influences the individual in the culture (Csikszentmihalyi, 1996). In this study the domain is music studies and the influences are musical exposures. The field which act as the gatekeepers to the domain are the judges that evaluated the musical creativity and general creativity of the trainee teachers. The third element is the person. In this study the person is the trainee teachers and the variables are gender, ethnicity, academic years, and socioeconomic status.

The primary purpose of this study was to investigate the influence of musical exposures that the trainee teachers came into contact with when they were in the teacher education institutions towards musical and general creativity. The musical exposure variables were keyboard grades, musical activity involvement, aural discrimination skills, and self-esteem of musical ability. This study also sought to examine the relationship between personal variables namely gender, ethnicity, academic years, and socioeconomic status, and musical exposures.

Furthermore, this study looked into the nature of the musical creativity and general creative abilities of music major trainee teachers in teacher education institutions in Malaysia. It also sought to examine the relationships between musical creativity and general creativity with personal variables. Besides that, the relationship between musical creativity and musical exposures, and general creativity and musical exposures were examined. This study also determined the predictors of musical creativity and general creativity.

The research adopted a correlational design where quantitative data were collected using a survey approach to collect empirical data. Respondents of the study comprised 108 female trainee teachers and 51 male trainee teachers undergoing a bachelor of teaching music education for primary school program in Malaysia. In total there were 159 pre-service music major trainee teachers as respondents in this study.

The dependent variables of this study were musical creativity and general creativity. The independent variables were personal variables and musical exposures. The personal variables examined in this study were gender, ethnicity, academic grades, and socioeconomic status. The variables in musical exposures were keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability.

Data for dependent variables were collected using two instruments, namely the the Torrance Test of Creative Thinking, and the Composition Test. The data for independent variables were collected from demographic questionnaire, Musical Activity Involvement questionnaire, Self-Esteem of Musical Ability questionnaire, and the Aural Discrimination Test.

Questionnaires requesting for demographic data such as gender, keyboard grades, and socioeconomic status were administered at the beginning of the data collection session. Following that the Musical Activity Involvement questionnaire and Self-Esteem of Musical Ability questionnaire were administered. Subsequently the data collection of the Aural Discrimination Test and the Torrance Test of Creative Thinking were carried out. Finally, the trainee teachers were individually requested to compose a composition using a keyboard or a digital piano and the composition composed was recorded.

A number of statistical analyses were employed to analyse the data gathered in the research. They included descriptive statistic, Mann-Whitney *U* test, Kruskal-Wallis test, *t*-test, one-way ANOVA test, Pearson Product-Moment correlations, Tukey post-hoc, general linear stepwise multiple regression, and hierarchical linear multiple regression. The data collected were analysed and reported in chapter four.

This chapter draws the conclusion of the study. It begins with a summary of the major findings. The six objectives of the study guide the discussion presentation. The findings are discussed and compared with previous findings in terms of consistency, contradictory, and inconsistency. The strongest predictor of musical creativity is discussed. Finally, the chapter concludes with the implications and recommendations for further research in related areas of the study.

The current study is consistent with some previous findings in some aspects, and contradictory to others resulting in inconsistent findings. Thus, it is important to accumulate and compare the research findings in order to provide an informative resource for teaching and research of musical creativity and general creativity. However, each study used different methodologies, and different ages of subjects. Furthermore, environment and culture carried out in different contexts might influence the results of the study. Therefore, comparison of the research findings should be understood with caution, since the contradictory and inconsistent findings may be due to the different methodologies, measurement instruments, and background culture of the respondents. Implications based on the results of the study should be suggested with caution too. This is because the results of correlational studies do not show causal relationships. Field and Miles (2010) stated that "considerable caution must be taken when interpreting correlation coefficients because they give no indication of the direction of causality" (p. 151).

5.2 Summary of Major Findings

The findings of this study are summarised as follows:

1. The majority of the trainee teachers did not have keyboard grades (63.5%). They were exposed to the choir and *gamelan* playing during their study in the institution. The self-esteem in musical ability of the majority of the trainee teachers is in the moderate (40.3%) and low category (45.9%).

As for their aural discrimination skills, the trainee teachers possessed moderately high (77.9%) aural skills. They exhibited high abilities in pitch discrimination (86.8%), meter discrimination (86.1%), and mode discrimination (89.6%). However they did not exhibit high abilities in interval discrimination (59.5%) and cadence recognition (65.7%).

2. The female trainee teachers were more exposed to keyboard playing than the male trainee teachers (Mean rank: Female = 88.90; Male = 61.16, $p < .01$). The Chinese trainee teachers were more skilful in keyboard than the other trainee teachers (Mean rank: Chinese = 106.76; Malay = 56.31; Others = 77.78, $p < .01$). The year one trainee teachers had better keyboard grades than the other trainee teachers (Mean rank: Year one = 101.80; Year two = 66.16; Year three = 92.02; Year four = 69.66, $p < .01$). However, there was no significant difference between socioeconomic status and keyboard grades. In addition, about half of the trainee teachers in this study were from lower socioeconomic status with no keyboard grades (45.9%).

3. The findings show that gender, ethnicity, and socioeconomic status were not significantly related to musical activity involvement. However, in terms of academic year, it was found that year 4 and year 3 trainee teachers were more exposed to musical activities compared to year 2 and year 1.

4. The aural discrimination skills were influenced by ethnicity and academic years but it was not influenced by gender and socioeconomic status. This means that the Chinese trainee teachers have higher aural discrimination skills than the other ethnicity (Mean: Chinese = 107.02; Others = 97.11, Malay = 97.05, $p < .01$). In addition, the trainee teachers in year three exhibited higher aural discrimination skills than the trainee teachers in year four (Mean: Year three = 105.98, Year four = 97.97 , $p < .01$).

5. This study found that self-esteem of musical ability was not influenced by any of the personal variables. The male and female trainee teachers exhibited comparable self-esteem of musical ability.

6. This study found that the trainee teachers' musical creativity is moderate (M = 42.12, SD = 11.99). They exhibited high ability in the repetition of the song but low ability in the musical resistance to premature closure. In terms of creative dimension, the trainee teachers exhibited high ability in the musical abstractness of title and musical fluency. However, they were less creative in musical originality and musical resistance to premature closure. In terms of technical goodness, the trainee teachers exhibited high ability in both craftsmanship and musical syntax. It was found that the trainee teachers had higher technical goodness compared to the creative dimension. However, the trainee teachers generally did not exhibit high creativity in musical sensitivity.

Results of general creativity found that the trainee teachers exhibited high creativity in figural resistance to premature closure and figural fluency. They were not so creative in figural elaboration and figural abstractness of title. However, comparing the creative index of figural creativity of the trainee teachers in this study with the creative index of students' in Torrance's study, it was found that the pre-service music major trainee teachers in Malaysia are equally creative compared to students of the similar age.

7. The components in musical creativity inter-correlated significantly with each other except with repetition of songs. Most of the inter-correlations among the components in musical creativity were moderate, strong, and very strong (r = .52 to .90, p < .01) except with musical abstractness of title. Musical abstractness of title had a weak but significant correlation with all the other components (r = .40 to .46, p < .01). Repetition of song did not correlate with any of the creative dimension components of overall musical creativity (near .0). However, repetition of song correlated with technical goodness and aesthetic appeal (r = .17 to .25, p < .01). The strongest correlation between all the components in overall musical creativity was craftsmanship and musical syntax (r = .90, p < .01).

This means that the trainee teachers who are creative in musical fluency are generally also creative in musical originality, musical elaboration, and musical resistance to premature closure, and are likely to be creative in musical abstractness of title as well. This also means that the trainee teachers who are creative in craftsmanship are generally creative in musical syntax, musical sensitivity, and musical resistance to premature closure.

As for general creativity, the results of the inter-correlations between components of general creativity showed that not all the components had significant correlation with each other. The strongest correlation was between figural fluency and figural originality (r = .72, p < .01). Figural elaboration had the weakest correlation with other components of general creativity.

This means that the trainee teachers who are creative in figural fluency are generally also creative in figural originality. But they are not necessarily creative in figural elaboration, figural abstractness of title and figural resistance to premature closure.

The investigation of the relationships between components of musical creativity and components of general creativity yielded the following results. The trainee teachers' musical creativity and general creativity abilities were likely related to one another. This is confirmed by the low significant correlation between creative index and overall musical creativity ($r = .21$, $p < .01$). This implies that trainee teachers who are highly creative in musical creativity are likely to be highly creative in general creativity and vice versa.

Results showed that musical fluency was significantly correlated to figural fluency ($r = .17$, $p < .01$), musical originality was significantly correlated to figural originality ($r = .16$, $p < .01$), and musical resistance to premature closure was significantly correlated to figural resistance to premature closure ($r = .16$, $p < .01$). This implies that these three creative abilities i.e. the ability to produce fluent idea, the ability to produce original ideas and the ability to resist closure to an idea influence each other.

On the contrary, musical elaboration and figural elaboration, and musical abstractness of title and figural abstractness of title were not significantly correlated. This implies that the ability to elaborate ideas musically does not influence the ability to elaborate ideas in pictures. Likewise, the ability to produce abstract ideas musically does not influence the ability to produce abstract ideas in pictures.

Results showed that musical syntax had the most correlations with the components of general creativity (figural fluency, figural originality, figural resistance to premature closure, figural abstractness of title and creative index). It had the strongest correlation with creative index compared to other components in musical creativity (r = .27, p < .01). This means that a trainee teacher who exhibits abilities in the four components of creativity in pictures is likely to compose music in a logical manner that makes sense.

Results showed that figural originality was significantly correlated with all the components of creative dimension (r = .16 to 23, p < .01). This means that if a trainee teacher who exhibit abilities in figural originality, is likely to be creative in all the five components of creative dimension.

Results also showed that repetition of song had no correlation with all the five components of general creativity. This means that the ability to repeat a composition is unlikely to be influenced by creative abilities.

8. The personal variables that influenced musical creativity were gender and ethnicity. The male trainee teachers were significantly more creative musically than the female trainee teachers (Mean: Male = 45.08; Female = 40.76, p < .05). The Chinese trainee teachers were significantly more creative musically than the Malays trainee teachers (Mean: Chinese = 44.96; Malay = 40.18, p < .05). However, there were no significant differences in musical creativity among academic year and socioeconomic status.

Even though the results show no significant difference between musical creativity and academic year, a detailed analysis revealed that year one trainee teachers outperformed year four trainee teachers in craftsmanship. Similarly, the year three trainee teachers and year two trainee teachers also outperformed year four trainee teachers in craftsmanship.

Likewise, even though the results showed no significant difference between musical creativity and socioeconomic status, a detailed analysis revealed that there are significant differences in musical fluency and repetition of songs between the high and low socioeconomic status trainee teachers. The high socioeconomic status trainee teachers had higher musical fluency than the low socioeconomic status trainee teachers. On the contrary, the low socioeconomic status trainee teachers had a higher repetition of song than the high socioeconomic status trainee teachers.

9. There were no influences of personal variables such as gender, ethnicity, and socioeconomic status towards general creativity. However, analysis between the components of general creativity showed that in terms of ethnicity, the Malay trainee teachers were more creative in figural elaboration than the Chinese trainee teachers. This study found that academic year had significant difference with general creativity. The trainee teachers in year 2 were more creative in figural originality than the trainee teachers in year 1 and year 4. They were more creative in figural elaboration than trainee teachers in year 4.

10. This study found that all the variables in musical exposures had significant relationships with musical creativity.

In terms of keyboard skills, the study found a pattern of gradual improvement in musical creativity as the keyboard grades increases. The trainee teachers who had good keyboard grades were significantly more creative in musical elaboration, craftsmanship, musical syntax, musical sensitivity, and musical creativity than trainee teachers who had less keyboard grades.

In terms of musical activity involvement, this study found that there were significant weak correlations in musical activity involvement among musical fluency, musical originality, and musical elaboration. This means that a trainee teacher who is involved in many musical activities such as choir, Gamelan, recorder ensemble, orchestra, or private music lesson (musical activity involvement) is likely to have the ability to produce musical ideas fluently (musical fluency), produce a unique composition (musical originality), and extend or reshape or refine musical ideas (musical elaboration). However, trainee teachers with strong musical experience are not necessarily able to create abstract ideas (musical abstractness of title), or have good technical abilities (craftsmanship and musical syntax) or have musical sense (musical sensitivity) or the ability to repeat composition accurately.

In terms of aural discrimination, this study found a significant correlation between aural discrimination and musical creativity (r = 48, $p < .05$). This means that a trainee teacher who is good in aural discrimination is generally creative musically. All the nine components of musical creativity were significantly associated with aural discrimination. This means that aural discrimination is likely to influence all the components in musical creativity.

As for self-esteem of musical ability, this study found that self-esteem of musical ability was significantly associated with eight of nine components of musical creativity. Only repetition of song was not correlated with self-esteem of musical ability. It can be concluded that the trainee teachers who exhibit high self-esteem are able to produce spontaneous ideas fluently (musical fluency), able to produce unique and original ideas (musical originality), able to build upon a musical idea by extending, reshaping, and refining the musical elements (musical elaboration), able to resist closing on a motif (musical resistance to premature closure), and able to produce titles that capture the essence of the composition (musical abstractness of title). Besides that, they are also able to compose with tonal and metric cohesiveness (craftsmanship) and able to structure the composition in a logical manner so that the music makes sense (musical syntax). In addition, they are also likely to be able to compose an expressive piece that reflects the aesthetic sensitivity in the whole composition (musical sensitivity).

However, they did not exhibit high ability in repetition of song. This means that a trainee teacher, who has a high self-perception of his or her music abilities, has the support and recognition of others with their music skills and has a personal interest and desire in music (self-esteem of musical ability) is likely to have creative music abilities.

11. This study found that all variables in musical exposures had no significant relationship with general creativity.

In terms of keyboard grades, this study found no significant difference between keyboard grades and general creativity. The trainee teachers with good keyboard grades not necessary are figural creative. However, in the components of general creativity, it was found that the trainee teachers who had no grades in keyboard were more creative in figural elaboration than trainee teachers who had keyboard grades of grade 8 and above.

This study found no significant correlation between musical activity involvement and general creativity and all of its components. This means that general creativity is independent of musical activity involvement.

This study also found no significant correlation between total scores of aural discrimination and general creativity. This means that a trainee teacher who exhibits good results in aural discrimination may not be figural creative.

Similarly, self-esteem of musical ability was not significantly correlated with general creativity and its components. This means that general creativity is independent of self-esteem of musical ability.

12. Among the predictor variables (keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability), aural discrimination accounted for the greatest variance in predicting musical creativity (23.0%). Self-esteem of musical ability is the second predictor of musical creativity (5.0%). The third predictor is keyboard grades (2.0%).

Aural discrimination is the strongest predictor of musical fluency (17.0%), musical originality (10.0%), musical elaboration (17.0%), musical resistance to premature closure (20.0%), craftsmanship (21.0%), musical syntax (18.0%), musical sensitivity (23.0%), repetition of song (3.0%). However, it is not a predictor of musical abstractness of title.

Self-esteem of musical ability is the second strongest predictor of musical fluency (3.0%), musical originality (6.0%), musical resistance to premature closure (3.0%), craftsmanship (5.0%), musical syntax (5.0%), and musical sensitivity (3.0%). Self-esteem of musical ability is the strongest predictor for musical abstractness of title (5.0%). However, it is not a predictor for musical elaboration and repetition of song.

Keyboard grade is the third strongest predictor of craftsmanship (5.0%), musical syntax (5.0%), and musical sensitivity (5.0%). It is not a predictor for musical fluency, musical originality, musical elaboration, musical resistance to premature closure, musical abstractness of title, and repetition of song. It is interesting to note that musical activity involvement is also not a predictor of musical creativity.

As for general creativity, all the four variables in musical exposures are not predictors of general creativity. However, keyboard grades are a predictor of figural elaboration (5.0%) and aural discrimination is a predictor of figural resistance to premature closure (3.0%).

From the analysis of multiple regressions and hierarchical multiple regressions, it can be concluded that aural discrimination remains the strongest contributor to musical creativity.

5.3 Discussion

This section presents the discussion of musical exposures and its relationships with personal variables. Then the nature of trainee teachers' creativity and the relationships between the components of creativity are presented. Following that is the discussion of the relationships of personal variables among musical creativity and general creativity. Then, the relationships between musical creativity and musical exposures and the relationships between general creativity and musical exposures are discussed. Finally the predictors of musical creativity and general creativity are presented.

5.3.1 Musical Exposures

In this study, four variables concerning musical exposures were measured. The four variables were keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability.

The majority of the trainee teachers in this study do not have a piano or organ qualification though they major in music education. The findings revealed that 63.5% of the trainee teachers do not have any keyboard grades. However, all of the trainee teachers are taught to play the keyboard in the Bachelor of Teaching program.

The musical activity involvement score showed that the majority of the trainee teachers had participated in choir and *gamelan* (95.0% and 64.2% respectively). The male trainee teachers were more exposed to musical activities compared to the female trainee teachers.

In terms of aural discrimination, as a whole, the trainee teachers were moderately good in their aural discrimination (average = 77.9%). They had good tonality skills and able to discriminate major and minor modes well. They were also able to differentiate high, low, and similar pitches accurately. However, they were weak in interval discrimination and cadence recognition. They were less competent to aurally distinguish the distance between two pitches. They were also less competent to identify the harmonic differences; therefore weak in the ability to differentiate perfect, plagal, imperfect, and interrupted cadences played in ten short melodies. The finding of this present study is consistent with the Universal Theory (Trainor, 1997) that a comparison between melody and harmony indicate that it is easier to identify melodic structures than harmonic structure.

The findings also indicate that aural discrimination components inter-correlate with each other. This means that a trainee teachers who exhibits a high ability in one component also exhibits high abilities in the other components. However, the results show that mode discrimination has no significant correlation with meter discrimination. This is a new finding since in the literature there is no study conducted to investigate relationships between components of aural discrimination. Therefore, no comparison with other studies is made.

In terms of self-esteem of musical ability, the majority of the trainee teachers in this study is categorised in the moderate and low categories. This means that the trainee teachers in this study do not have high self-esteem about themselves in their musical ability. In comparison with other studies, the self-esteem of the trainee teachers in this study is slightly lower (M = 121.23) than the self-esteem mean score of subjects in Auh's (1995) study (M = 126.10) and in Draves's (2008) study (M = 128.65).

5.3.2 Musical Exposures and Personal Variables

This study found that gender is not significantly related to musical activity involvement, aural discrimination, and self-esteem of musical ability. However, gender is significantly related to keyboard grades. The female trainee teachers in this study showed higher competency in playing the keyboard compared to the male trainee teachers.

Though gender is not significantly related to aural discrimination and all the components of aural discrimination, the mean score of aural discrimination of female trainee teachers was higher than male trainee teachers. The finding of this study concurred with the study conducted by Auh (1995). Auh (1995) conducted a musical achievement test to examine the subjects' pitch, interval, and meter discrimination abilities. The composite score of aural discrimination was 37.24 out of a total score of 80. The subjects in Auh's study had moderate aural discrimination. There were only 19 male students compared to 48 female students in her study. Auh found that gender has no effect on all the components in aural discrimination.

In terms of ethnicity, this study found significant differences in the mean scores of keyboard grades and aural discrimination. Musical activity involvement and self-esteem of musical ability is independent of ethnicity. This means that aural discrimination is influenced by the ethnicity of the trainee teachers. The Chinese trainee teachers had significantly higher aural discrimination skills than the Malays, Iban, Kadazan, Dusun, Bidayuh, Bajau, and Indian trainee teachers. The Chinese trainee teachers were also most skilful in keyboard than the other trainee teachers. There is no study available for comparison in the local context concerning ethnicity and musical exposures. Though this finding has no reference, it provides information and references for future research concerning the influence of Malaysian ethnic groups on musical exposures.

Concerning the relationship between ethnicity and self-esteem of musical ability of the trainee teachers in this study, the findings revealed that there is no significant difference between ethnicity and self-esteem of musical ability. However, the Chinese trainee teachers had a lower self-esteem score compared to the Malay trainee teachers though the Chinese trainee teachers had higher aural discrimination skills and keyboard competency compared to the Malay trainee teachers. The results of this study support the findings by Brand (2004) who states that Chinese students have lower self-esteem compared to other ethnic group. Although there are similarities in both studies, Brand's respondents were music education majors from America, Australia, and China. The Self-Description Questionnaire III (SDQ) by Marsh was used to measure self-esteem instead of the Self-esteem of Musical Ability by Colwell.

In terms of academic years, this study found significant differences in the mean scores of keyboard grades, musical activity involvement, and academic years. Self-esteem of musical ability is independent of academic years. The findings show that there was a gradual increase in aural discrimination level of the trainee teachers from year one to year three. However, the aural skills decreased in year four. The decrease in aural skills in year four could be caused by the arrangement of the course pro forma in the bachelor program where aural skills are taught at the beginning of the first two years. Emphasis on musical skills lessens in the fourth year to give way to pedagogical studies and attachment of practicum in school. In addition the keyboard skills of the trainee teachers could have influenced their aural discrimination result. This is because there are more trainee teachers with grade 6 to 7 and grade 8 and above in year three. In addition, year four has the most trainee teachers without keyboard grades.

To further support the above findings, the results show that in terms of keyboard skills, generally there was a gradual increase in aural discrimination as the keyboard skills increases. It was found that there were significant differences between the aural discrimination scores of the trainee teachers who had no keyboard skills with those that had keyboards skills above grade 6. It can be concluded that in order to achieve high aural skills, the level of keyboard skills acquired needs to be above grade 6.

In terms of socioeconomic status of the trainee teachers, this study found that the financial background of the trainee teachers' family did not influence their aural discrimination skills, musical activity involvement, self-esteem of musical ability, and keyboard grades. The findings contradict the findings by Kinney (2008), who found significant differences in the test score of the ensemble participants from different socioeconomic status background. The difference in findings could be influenced by the age factor and environment differences between this study and the study by Kinney. The respondents in Kinney's study were 6^{th} and 8^{th} grade urban middle school students chosen from a performing ensemble program.

5.3.3 Musical Creativity

Despite the fact that limited Malaysian norms are available for comparison, the results from the descriptive statistics of the data indicate that the musical creative abilities of the trainee teacher in this study were moderate (60.20%).

The musical creativity consisted of four dimensions namely creative dimension, technical goodness, aesthetic appeal, and repetition of song. Comparing the results of the four dimensions, it is clear that the trainee teachers in this study have a higher technical goodness than the creative dimension. In terms of technical goodness, most of the compositions were well structured melodically and rhythmically (craftsmanship). They were composed in a logical manner and makes sense (musical syntax). Analysis of the composition found that most of the compositions were constructed around a tonal centre. There were tonal cohesiveness and metric cohesiveness in most of the compositions. However, these compositions lacked originality and the form of the composition were rigid. Most of the compositions were in binary form. The compositions also were less musically expressive.

From the pattern of performance for the creative dimension in musical creativity, the results show that the trainee teachers in this study are most creative in producing abstract titles for a music composition. They are also creative in producing many new ideas musically. However, these trainee teachers are less creative in producing original ideas in their composition. The melodies composed were less original. Results also showed that the trainee teachers were unable to prolong a musical idea by expending the idea further before moving on to the next idea.

The pattern of performance for the technical goodness in musical creativity shows that the trainee teachers have good craftsmanship and musical syntax compared to the creative dimension and aesthetic appeal. The results show that the trainee teachers have good mastery in technical skills of tonal and rhythmic pattern, and the ability to structure composition in a logical manner.

The results also show that the trainee teachers are less creative in musical sensitivity. The trainee teachers were unable to produce compositions that have good aesthetic value. The compositions were less expressive.

Last, results concerning the nature of musical creativity of the trainee teachers revealed that most of the trainee teachers were able to accurately repeat the second playing of their composition.

In this study, the trainee teachers exhibited higher creative abilities in technical goodness compared to the creative dimension. This is probably because of the composing method taught to the trainee teachers in the program. The trainee teachers were introduced to the topic of composing in their foundation course. In the course, the trainee teachers were taught the characteristics of composing and were guided to compose based on the rules of harmony (Ministry of Education, 2006a). This may have influenced the composition composed whereby the trainee teachers conform to the rules taught to them. In addition, when the starting note middle C was fixed, this further increases the conformity towards what has been taught.

Creativity and conformity seem to be an antithetical psychological process (Runco, 2007b, Sternberg & Lubart, 1995). The results show that the trainee teachers were less creative in producing original ideas and the compositions were less expressive. This could be due to the nature of the composition test where the trainee teachers were expected to compose in a given time frame and without prior notice. The excitement and mental state during the composition test might not be conducive for the trainee teachers to compose a composition that has high aesthetic values.

Furthermore, the lack of originality and expressiveness in the composition due to the nature of the task may have put the trainee teachers in a state of disequilibrium. When a person is in the state of disequilibrium, adaptation of what has been taught will occur. The result is consistent with the Piagetian Theory (Runco, 2007a) that adaptation occurs when the individual experiences a kind of disequilibrium or in a state of adversity. According to Runco (2007a), adaptation may sometimes undermine creativity. The adaptable person will conform to what has been taught and this will influence the self-expression and originality that are required for creativity.

This study also found that musical fluency, musical originality, musical elaboration, musical resistance to premature closure correlates highly with each other. Musical abstractness of title has a significant but low correlation with the above components. Musical abstractness of title has the highest mean score compared to the other components of creative dimension. This means that the trainee teachers are more creative in musical abstractness of title. The trainee teachers who are creative in musical abstractness of title are likely to be creative in musical fluency, musical originality, musical elaboration, and musical resistance to premature closure.

In addition, this study found that musical craftsmanship, musical syntax, and musical sensitivity are highly correlated with each other. This shows that the trainee teachers, who have the mastery of tonal and rhythmic abilities, are able to compose in a logical manner, and the composition is musically expressive.

The findings of this study support the findings of Auh (1995). Auh also found that the inter-correlation between the composition dimensions in her study to be high (r = .44 to .89) except for repetition of song. Auh stated that there could be possible reasons for the high inter-correlations. Judges rating the students' compositions might have regarded the components of craftsmanship, musical syntax, musical originality, and musical sensitivity to be a single aspect of musical creativity. The judgements from the judges might not have been discrete enough to distinguish each of the dimensions.

The results show that the highest component of musical creativity is repeating of song. The trainee teachers repeated their composition with high accuracy. However, this ability is not significantly correlated with musical fluency, musical originality, musical elaboration, musical resistance to premature closure, and musical abstractness of title. In other words, the ability to play the second time of a composition accurately is unlikely to be similar to the ability to compose a composition creatively. The finding in this study supports the study by Auh (1995). Auh also found that repetition of song does not significantly correlate with other components of musical creativity.

5.3.4 General Creativity

The results from the nature of the creative abilities of general creativity show that the highest creative ability of the trainee teachers is the ability to resist the tendency to leap to conclusions prematurely without considering the available information. Resistance to Premature Closure is one of the creative potential that measures intellectual curiosity as well as open-mindedness (Torrance, 2008). The findings indicate that the trainee teachers are inquisitive and curious. Besides that, the results show that the trainee teachers are capable of producing a large number of ideas using figural fluently. However, the trainee teachers are less creative in elaborating ideas, synthesizing and organizing thoughts from a given problem.

In Malaysia, the awareness of the importance of creativity has been the aspiration of the curriculum planners. Teachers especially music teachers in the primary education are encouraged to implement creative activities in the classrooms. This is stated in music syllabuses since the implementation of the Integrated Curriculum for the Primary School syllabus (Ministry of Education, 1995, 2001). This could be one of the probable reasons that the general creativity of the trainee teachers was slightly higher than the results found in Torrance's study (Torrance, 2008). Furthermore, Siti Rafiah (2008) found that Year five pupils showed creative ability in her study. She stated that the inclusion and integration of creativity in the Primary School Integrated Curriculum have succeeded.

The findings of this study show that the trainee teachers' general creativity is comparable to students of similar age in the United States. It was found that the trainee teachers in Malaysia have slightly higher creative abilities than those in the United States. According to a report by Kyung Hee Kim, an associate professor of educational psychology at the College of William and Mary in Williamsburg, Virginia, she reported that the Americans' creativity has plummeted since 1990 (Bronson & Merryman, 2010, July 10). Kyung Hee Kim study was carried out on 300,000 children and adults using the Torrance Test of Creativity Thinking. Kim further stated that the possible explanation for this decrease in creativity is because time spends on doing activities such as watching television, computer, playing online games have increased. Furthermore, added Kim, is the lack of creativity development and the stifling of children's creative opportunities in classrooms.

This study found that the trainee teachers are weaker in figural elaboration compared to figural fluency and figural originality. Similarly to the findings by Singh (2011), elaboration was a weaker creative component compared to figural fluency and figural originality. On the contrary, Yong (1994) found figural elaboration as the most creative component in his study. Yong examined four creativity components that are figural elaboration, figural originality, figural fluency, and figural flexibility.

The results of the relationships between components in general creativity in this study show that figural fluency and figural originality of trainee teachers are highly correlated. The inter-correlation between figural elaboration and figural fluency, figural elaboration and figural originality, figural elaboration and figural resistance to premature closure are low and not significant. This means that a trainee teacher who is able to create ideas fluently (figural fluency) or able to create original ideas (figural originality), is not necessarily able to elaborate ideas (figural elaboration). This finding supports the findings of Kiehn (2000) who also found a high inter-correlation between figural fluency and figural originality. According to Kiehn, the high inter-correlation may indicate that figural fluency and figural originality criteria are probably measuring similar creative abilities.

The results also show that the correlation of figural abstractness of title and figural fluency, and figural abstractness of title and figural resistance to premature closure are low and not significant. This means that a trainee teacher who is able to create new ideas figural (fluency) might not necessary be able to synthesise an idea (figural abstractness of title) or have the ability to avoid making conclusions prematurely (resistance to premature closure). The abstractness of title

5.3.5 Musical Creativity and General Creativity

The relationship between musical creativity and general creativity shows a significant positive correlation. However, the correlation is weak. This finding concurred with some other studies that examined the relationship between musical creativity and general creativity. The results of the present study support the study by Vaughan (1971), Vold (1986), and Kiehn (2003) who found significant but weak correlation between these creative thinking. According to Kiehn, the findings suggest that the ability to draw artistic shapes and figures may be related to the ability to create music improvisations. Supporting the findings by Kiehn and extending the literature on musical creativity, this study suggests that drawing artistic shapes and figures may be related to the ability to create music compositions.

However, this finding contradicts the findings of Gorder (1980), and Webster (1977) who found no significant relationship between figural creativity and music creativity. The finding in this study could suggest that the ability to draw artistic shapes and figures may be related to the ability to compose music. However, the weak correlation could imply that the process of creative thinking in composition and the process of creative thinking in drawing are unique by itself.

Another interesting findings found in this study is musical fluency and figural fluency are correlated significantly. Musical originality and figural originality, and musical resistance to premature closure and figural resistance to premature closure are correlated positively.

5.3.6 Musical Creativity and Personal Variables

In terms of gender, the results of this study suggest that musical creativity may vary with the gender of the trainee teachers. Analysis of variance found that there is a significant difference between the male and the female trainee teachers on musical originality, musical abstractness of title, craftsmanship, musical syntax, musical sensitivity, and the overall score of musical creativity. Results indicate that the male teachers are significantly more musically creative than the female trainee teachers. The result supports the findings of Kiehn (2000). Khien's study also found that male students scored higher than female students in the Vaughan Musical Creativity Test. However, Kiehn only measure musical fluency and originality in his study. The findings of this study contradict with the findings from Auh (1995), Baltzer (1988, 1990), Swanner (1985), and Webster (1979) who found no gender difference in musical creativity. Webster found that there are no significant differences in the creativity score between male and female students however, the male students scored slightly higher than female in the composition creativity test.

There is no available Malaysian norm to make comparison with the finding of this study between gender and musical creativity; hence no comparison is made in the local context. However, the findings of this study could be used as a reference for future research on respondents in Malaysia.

In terms of ethnicity, the results of this study indicate that the Chinese trainee teachers are more creative in musical creativity than the other ethnic group. The data analysis revealed that the Chinese trainee teachers outperformed the other ethnicity in musical fluency, musical originality, musical elaboration, musical resistance to premature closure, craftsmanship, musical syntax, and musical sensitivity. The musical creativity score shows the Chinese trainee teachers are more creative in musical creativity than the other ethnic groups. A significant difference was found between the mean score of musical creativity among the Chinese trainee teachers and the Malay trainee teachers. The results confirmed that the Chinese trainee teachers are more musically creative than the Malay trainee teachers.

Looking at the demographic data on ethnicity and keyboard grades, it was found that 93.2% of the Malay teachers had no keyboard grades and only 31.3% of the Chinese trainee teachers had no keyboard background. The family encouragement in taking music lessons at a young age could be one of the factors that influence this finding.

According to the Theories of Social-Environmental effects on creativity, intrinsic motivation is the primary driving force to the highly creative rather than the extrinsic motivation. The social environment plays a key role in the motivational orientation which impacts the creativity (Amabile, 1996). The findings support the holistic view of creativity by Csikszentmihalyi (1988, 1996) in his system model of creativity that cultural domain plays a role in a person's creativity.

In terms of the academic year, this study found that there is no development difference between academic year and musical creativity. As the trainee teachers progress in the bachelor of the teaching program, there is no influence of the program towards their musical creativity. Kiehn (2000) also found no parallel progression in musical creativity between students in grade 4 and to grade 6. Though both studies have subjects in different age group, they yielded the similar result. Webster (1979) found no significant relationship between grade level and creative behaviour in composition. Webster stated that creative potential in music cannot be necessarily associated with age and grade level. This is further supported by Baltzer (1988) who found that age and creativity are not significantly related. The findings of this study supported the study of Webster (1979) and Baltzer (1988).

In terms of socioeconomic status of the trainee teachers, the results indicate that there is no significant correlation between musical creativity and socioeconomic status of the trainee teachers. This means that socioeconomic status does not influence the trainee teachers in their musical creativity. Contrary to the general belief that high social economic status trainee teacher is at an advantage compared to low socioeconomic status trainee teachers in creativity (Yong, 1994), and academic achievement (Deisler, 2011). However, the high socioeconomic status trainee teachers in this study had higher mean scores in all the components of musical creativity except repetition of songs compared to low socioeconomic status trainee teachers.

5.3.7 General Creativity and Personal Variables

In terms of gender, the results of this study found that the male trainee teachers had a higher mean score than the female trainee teachers in general creativity. However, the difference is not significant. This suggests that though the male trainee teachers are better in general creativity, the female trainee teachers are as good. The findings in this study contradict with a study by Yong (1986). Yong (1986) found that male students are more creative that female students in the figural and verbally Torrance Test of Creative Thinking. In Yong's study, sex is the foremost significant predictor for overall creativity and figural creativity.

According to Yong, there is a strong pressure in the Malaysian society to have boys and girls behave according to their respective sex roles. Boys are encouraged to be expressive and innovative, as for girls they are expected to be passive, soft-spoken, and self-effacing. Yong further stated that in many Malaysia homes, the girls are expected to be a housewife and mother as their future roles. Some families considered this role to be more important than academic or professional life. Hence, creative girls are supressed to be passive and unadventurous.

However, Yong's study was carried out in 1986, 20 over years ago. As mentioned in chapter 1, studies conducted before year 2000 was considered outdated. The environment and sociological changes would have influenced the upbringing of children and expectations of parents. Parents no longer differentiate the roles of male and female. Though girls are still expected to be soft-spoken and modest, they are also expected to compete with the boys in the academic and innovation field.

In a more recent study by Charyton (2005) and Charyton and Snelbecker (2007) it was found that there were no significant differences in general, scientific, and artistic creativity with gender among music major. However, a more recent study by Singh (2011) on form four students in a Malaysian school found that the male students are more creative than female students. Nevertheless, female students have improved in their creative abilities. The components of creativity where male students had outperformed female students have decreased. Female students are found in Singh's study to be more creative in figural originality compared to male students. Hence, the finding in this study is in line with the System Model of Creativity by Csikzentmihalyi (1988) that creativity does not happen solely in the mind of the individual. The practices of the culture and society transmit to the individual.

In terms of ethnicity, this study found that the Malay trainee teachers had a higher mean score of general creativity than the other ethnic groups. They had higher mean scores in figural originality, and figural elaboration. The Chinese trainee teachers had the lowest mean score of figural elaboration. The result also shows that there are significant differences in the figural elaboration mean score between the Malay trainee teachers and the Chinese trainee teachers. This means that the Malay trainee teachers are more creative in figural elaboration compared to the Chinese trainee teachers. This finding concurs with the findings by Chua (2002). Chua in his study concerning creative and critical thinking of Malaysian arts and science students found that the Malay students had higher ability in figural elaboration than the Chinese students.

In terms of the academic year, the results of the study show that there is no parallel development between academic year and general creativity. As the trainee teachers progress in the bachelor of teaching program, there is no influence of the program towards their general creativity. There is no significant difference in the creative index mean score between the trainee teachers in different years. However, results show that the year two trainee teachers are more creative in figural originality and figural elaboration than the other trainee teachers significantly. The findings in this study are similar to the findings by Khien (2000). Khien administered the Torrance Test of Creativity Thinking to grade two, four, and six students. He found no significant difference in mean scores of grade four and grade six students in terms of musical creativity.

In terms of socioeconomic status, this study found that there is no significant correlation between general creativity and socioeconomic status. This means the socioeconomic status does not influence the trainee teachers in their general creativity. However, the high socioeconomic status trainee teachers had higher mean scores in all the components of general creativity except figural fluency compared to the low socioeconomic status trainee teachers. These results suggest that, in the Malaysian context, socioeconomic status has no effect on the general creativity of the trainee teachers. This can be explained by looking at the nature of the Malaysian society. The aspiration of the majority of parents irrespective of their socioeconomic background is that their children perform well in examinations. Priority given to education and encouragement to nurture the creativity of their children are the roles of parents in both high and low socioeconomic statuses. This finding supports Yong (1986) who found that socioeconomic status had no significant effect on creativity. This could probably indicate that the aspirations of the parents in Malaysia on their children's education performance have not changed.

Contrary to the above findings, Gan (1998) found that the high socioeconomic status trainee teachers have a higher level of creative perception than the low socioeconomic status trainee teachers. Gan's respondents were university students of the similar age as the respondents in this study. A probable reason for the contradict finding is that Gan used different measurement to examine creativity. Her instruments was the Onomatopoeia and Images and the Something About Myself. As for this study, the Torrance Test of Creative Thinking was used to measure general creativity. Hence, this inconsistent findings call for further research.

5.3.8 Musical Exposures and Musical Creativity

This study found that in terms of keyboard grades, there is a parallel development of keyboard grades and musical creativity. This means that the trainee teachers who are creative in musical creativity are also good in their keyboard playing. The results are further supported by the findings that a significant difference in musical creativity was found among trainee teachers with grade 8 and above and trainee teachers with no keyboard; thus concluding that keyboard skills play an important role in enhancing musical creativity.

This study also found that in terms of components of musical creativity, the trainee teachers with higher keyboard grades scored higher in musical fluency, musical originality, musical elaboration, musical resistance to premature closure, craftsmanship, musical syntax, and musical sensitivity than the trainee teachers with lower keyboard grades. However, significant differences were found in musical fluency, musical elaboration, craftsmanship, musical syntax, and musical sensitivity. These findings further ascertain that keyboard grades influence the trainee teachers' musical creativity.

Webster (1979) also found that students who have piano background scored higher on musical creativity compared to those without piano background. Webster stated that there is a tendency for individuals who have a piano lesson background to score higher on all the creativity measure in music. In addition, Daignault (1996) found that children who have undergone piano study show the ability to manipulate notation and this ability effected their compositional products. The reason that may account for these findings is that musical creativity is measured through the composition product played on the keyboard. The ability to compose on the keyboard may require keyboard skills. Hence, the trainee teachers who have keyboard grades are able to master the instrument better than those without keyboard grades. From the pattern of performance in musical creativity, this study found that the trainee teachers performed better in the technical of goodness dimension compared to the creative dimension. This finding could have been influenced by the keyboard skills of the trainee teachers.

Besides that, this study found that musical activity involvement of the trainee teachers correlated very weakly but was significant and positive with musical creativity. Musical activity involvement is also significantly correlated with musical fluency, musical originality, musical elaboration, and musical resistance to premature closure. However, there is no correlation between musical activity involvement among the components of musical abstractness of title, craftsmanship, musical syntax, musical sensitivity, and repetition of song.

The findings show that only components in creative dimension correlated significantly with musical activity involvement. There is no correlation between technical goodness and aesthetic appeal with musical activity involvement. Likewise, there is no correlation between repetition of song with musical activitiy involvement.

This means that activities such as choir, band, orchestra, recorder ensemble, caklempong, and private music lesson may increase the trainee teachers' musical creativity in the aspects of (1) the ability to produce original musical ideas fluently; (2) the ability to extend and refine the musical ideas; and (3) the ability to keep open the idea long enough before going to the next idea. However, these activities may not increase the trainee teachers' musical creativity in the aspects of (1) the ability to produce abstract titles; (2) the technical mastery in tonal centre and rhythmic regularity; and (3) the ability to compose an expressive piece.

The findings from this study concurred with the findings of Laycock (1992). Laycock found that students who had some form of music experience such as private lesson, ensemble experiences, church or other outside-of-school activity were likely to have demonstrated more successful creative product. Laycock found that musical experiences is related to compositional ability. Similar to Laycock, Menard (2009) also found that years of experiences in playing a primary instrument correlate significantly with creativity. However, Menard (2009) also found that musical experiences also correlates with craftsmanship and aesthetic value but the correlation is very weak.

This study found no significant correlation between musical activity involvement and technical goodness or aesthetic appeal. Auh (1995) also found no significant relationship between formal musical experiences and musical creativity in the aspects of craftsmanship, syntax, originality, sensitivity, and repetition of song. The findings of this study are quite similar to the findings by Auh except that this study found a significant relationship between musical creativity and musical originality.

A possible explanation for the inconsistent findings could be that the duration of exposures on musical activities varies between the above studies. In Menard's study, the participants were exposed to regular music instructions every week and each class period was approximately 50 to 90 minutes. As for Auh's study, the students were not exposed to school band or orchestra. The common activity was choir practice which was held twice a week. Similar to Auh's study, in this study, 95% of the trainee teachers were exposed to choir practice. Not only that, from the observation at the trainee teachers' involvement in musical activities in the teacher education institutions was revealed that there is no formal musical activity offered by the institutions. The trainee teachers were free to form any musical groups based on their interest. There was no fixed duration of practice time in the academic timetable.

Though there is a lack of study investigating musical creativity and musical activity involvement in the local context, a number of studies have shown that musical activity involvement increases academic performance (Davenport, 2010; Deisler, 2011; Kinney, 2008; Streb, 2009). For example, Kinney (2008) found that there are significant differences in achievement between students who participated in choir and students who participated in band - students who participated in band outperformed those who participated in choir. Hence, a possible explanation for the very weak correlation between musical creativity and musical activity involvement from the observation by the researcher are (1) there is no allocated time for the trainee teachers to be involved with musical activities; (2) time taken for academic studies were too long (from 8 am till 6.30pm) on weekdays; and (3) the lack of support and seriousness on the part of the administrator of the institution in emphasising musical activities exposure to the trainee teachers.

Besides that, this study found that the correlation between musical creativity and aural discrimination score is moderate and significant. This means that a trainee teacher who has good musicality (aural discrimination), is also musically creative. A trainee teacher who has good musicality in all the components of aural discrimination is more musically creative than a trainee teacher who has good musicality in part of the components in aural discrimination. This finding supports Priest (2001) who states that a successful composition needs to have aural ideas.

All the components in aural discrimination such as pitch, interval, meter, cadence, visual, and mode are significantly correlated with overall musical creativity. However, some of the correlations are moderate and weak. This means that a trainee teacher who has the ability to identify the distance of two to five pitches (interval discrimination), and the ability to identify written notes from the notes sounded (visual discrimination) are more musically creative than a trainee teacher who has the ability to identify differences in meter (meter recognition) and mode (mode recognition). A closer examination of the relationship revealed that a trainee teacher who has the ability to discriminate more than two aspects in one item (interval and visual) is more musically creative than a trainee teacher who has the ability to discriminate less than two aspects.

Repetition of song correlated with pitch and interval in the components of aural discrimination. However, the correlation is very weak. There is no correlation between repetition of song with meter, cadence, visual, and mode. Playing a composition composed for the second time may not need musical abilities such as meter, cadence, visual, or mode. A trainee teacher who has the ability to recognise pitch and interval will probably be able to accurately repeat composition. However, the trainee teacher that has the ability to repeat a song accurately is not necessarily a musically creative trainee teacher. This is because it was found that repetition of song has no correlation with all the components in the creative dimension as stated in chapter 4.

In addition, the correlation of aural discrimination with technical goodness and creative dimension are significant and moderate. Technical goodness has a higher correlation with aural discrimination than the creative dimension. This could mean that a trainee teacher that has good craftsmanship and ability to structure composition in a logical manner (technical goodness) is more musical than a trainee teacher who has creative abilities such as musical fluency, musical originality, musical elaboration, musical resistance to premature closure, and musical abstractness of title (creative dimension).

The results from this study also found that the highest correlation between aural discrimination and the components of musical creativity is musical sensitivity and overall musical creativity. This means that a trainee teacher who is good in aural discrimination will be able to compose an expressive and creative composition.

The findings from this study support the findings of Auh (1995). Auh found that there were significant positive relationships between musical creativity and musical achievement. Auh found that musical achievement in pitch was significantly related to craftsmanship, musical syntax, and repetition of song. The composite score of musical achievement was significantly related to musical syntax and repetition of song. The correlation reported in Auh's study is also found in this study. However, Auh found that interval and meter have no correlation with all the composition dimensions in her study. In this study, the interval is significantly correlated with all the dimensions in musical creativity. However, the meter has no correlation with musical originality and repetition of song. As for the composite score, Auh found that the significant correlations are between composite score and musical syntax, and repetition of song. In this study the total score of musical achievement correlates with all the components in musical creativity.

Webster (1979) found musical achievement total correlates with compositional creativity. The correlation index in the Webster's study is smaller than the correlation index of this study. Webster found only one component of musical achievement that correlated significantly with compositional creativity which is auditory-visual discrimination. The other components namely melody recognition, pitch recognition and instrument recognition had no correlation with compositional creativity. Though this study found that all the components of musical achievement correlated with musical creativity, auditory-visual discrimination had a stronger correlation compared to the other components.

A comparison of the findings in this study concerning aural discrimination and musical creativity with other research studies in the local context was not possible as the this is a new research finding.

In terms of self-esteem of musical ability, the results of this study show that the trainee teacher who had high self-esteem also had higher overall musical creativity score compared to the trainee teachers who had low self-esteem. However, the trainee teachers with low self-esteem did better in repetition of songs. This study found that there is a significant correlation between self-esteem and musical creativity. The finding of this study is in agreement with four studies. Laycock (1992), Austin (1990), Hedden (1982), and Schmidt (1979) found a significant relationship between self-esteem and musical creativity. In Laycock's study, self-esteem is the most significant factor related to compositional creativity of high school students. However, the finding contradicts with findings from Auh (1995) who found no relationship between self-esteem and musical creativity. The inconsistent findings call for further research in the area of musical creativity and self-esteem of musical ability.

5.3.9 Musical Exposures and General Creativity

In terms of keyboard skills, the results show that there is no parallel development of keyboard skills and general creativity. The trainee teachers with no keyboard skills during enrolment scored the highest in creative index. This means that keyboard skills do not influence general creativity.

In terms of musical activity involvement, the results show that musical activity involvement has no significant correlation with general creativity and all the components in general creativity. The involvement in musical activities such as choir, recorder ensemble, *gamelan*, *caklempong*, band, orchestra, and private music lessons has no influence on the trainee teachers' general creativity.

The correlation between creative index and all the components of aural discrimination is not significant. Auditory-visual discrimination has near 0 correlations with creative index. However, there are significant correlations between interval discrimination with figural fluency and figural originality. The correlation is very weak.

In terms of self-esteem in musical ability, the results show that the musical self-esteem of the trainee teachers had no significant correlation with general creativity and all the components in general creativity.

A possible reason for the above results is that the musical exposures investigated in this study such as keyboard grades, musical activity involvement, aural discrimination, and self-esteem of musical ability are exposures concerning the aspect of music. It is not surprising that all the variables in musical exposures are not significantly related to general creativity. In addition, this study also found that musical creativity and general creativity are weakly correlated. This further supports the insignificant findings.

Again, this finding on musical exposures and general creativity has no reference in the local context, it is hope that the findings in this study can provide information and references for future research in the area of creativity.

5.3.10 Predictors of Musical Creativity and General Creativity

The best predictor of musical creativity among musical exposures is aural discrimination. Aural discrimination alone accounted for 23.0% of the variance in musical creativity. This finding informed that the trainee teachers' aural discrimination is the main factor that influences musical creativity. By eliminating personal variables, aural discrimination still remains as the best predictor of musical creativity. After the elimination of personal factors, aural discrimination alone accounted for 23.0% of the variance in musical creativity. With that, the aural discrimination skills should be emphasised with more importance. Instead of just having the aural and sight singing studies in semester 1 and semester 3, these skills should be taught in other semesters to to improve the trainee teachers' musical aural and auditory-visual skills. These skills can be incorporated in other music courses in order to facilitate and enhance musical creativity throughout the length of study in the teacher education institutions.

The results of this study support finding by Webster (1979). Webster found that the only predictor of composition potential is music achievement (aural discrimination). All the other variables such as music aptitude, figural creativity, verbal creativity, IQ, gender, performance medium, grade level, age, and piano lesson background were found not related. Webster further stressed that the finding is important because it becomes clear that none of the other variables under consideration can be used to help predict potential in music composition other than music achievement.

Edwin Gordon in his Music Learning Theory states that the ability to think music in the mind with understanding will enable a person to draw greater meaning from the music that they compose. To hear and comprehend music in mind is more than just remember pitches, intervals, durations, or rhythms. They think tonal patterns and rhythm patterns. The process of composing is a creative experience according to Webster (2002) where the final creative product is a composition. Aural skills are enabling abilities stated in the Model of Creative Thinking Process in Music by Webster.

The second predictor of musical creativity is self-esteem. Self-esteem of musical ability alone accounted for 5.0% of the variance in overall musical creativity. This result shows that the trainee teacher's self-esteem influences his or her musical creativity. However, the influence is not prominent.

The third predictor of musical creativity is keyboard grades. The influence of keyboard grades towards musical creativity is 2.0%.

The model for predictors and the strength of the predictors of musical creativity is shown in Figure 5.1. In addition, Figure 5.2 shows the model and strength of the predictors of musical creativity after eliminating the personal variables.

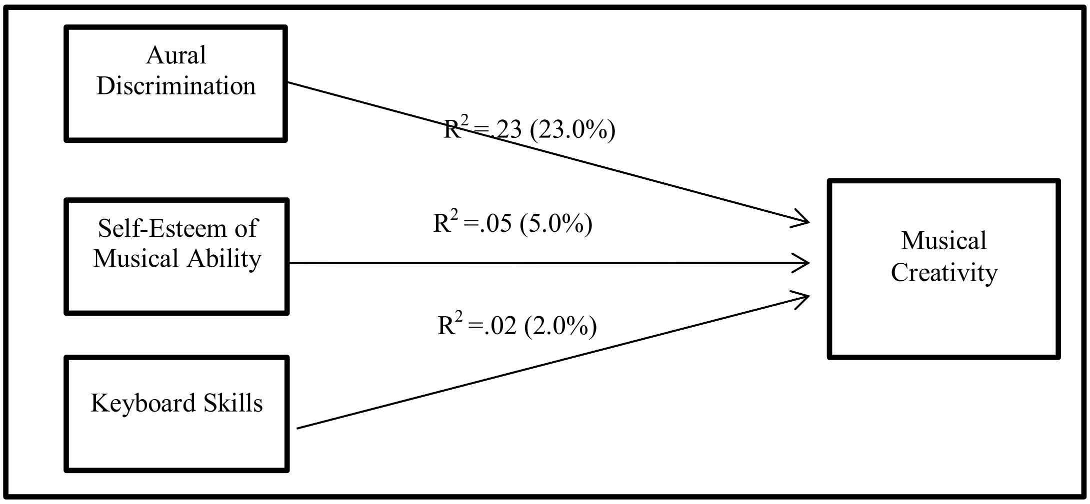

Figure 5.1. Summary of Predictors of Musical Creativity

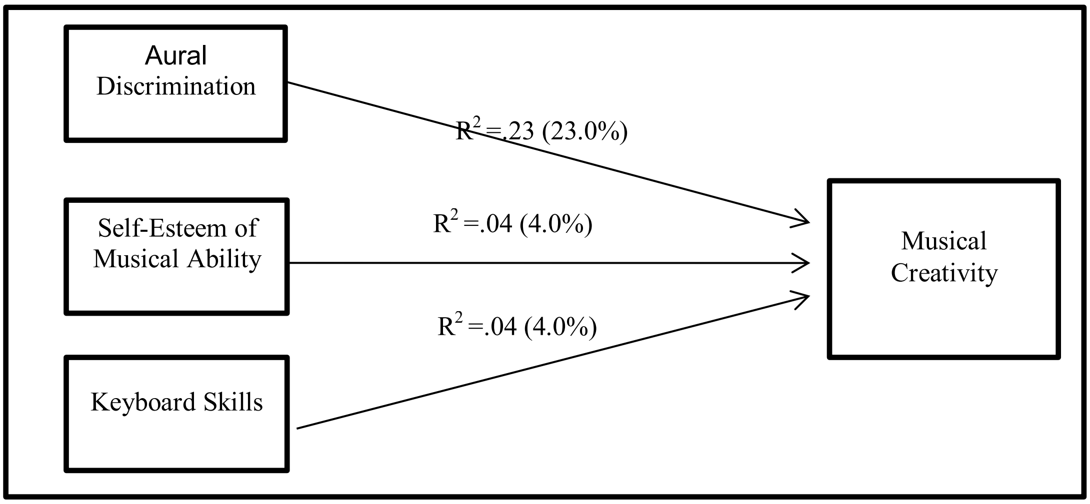

Figure 5.2. Summary of Predictors of Musical Creativity with Moderated Personal Variables

From the data presented in Figure 5.1 and Figure 5.2, it is found that the predictor variables of musical creativity remains the same with or without eliminating personal variables. The strength of changes in the aural discrimination variable are similar. This shows that the personal variables are not significant moderators of the effect of musical exposures on musical creativity.

5.4 Implications for Teaching

The results of this study revealed that the composition is a suitable measurement of musical creativity and the assessment using Amabile's consensual assessment technique is valid and accurate. The strong correlations between the judges scoring of the compositions show that lecturers and music educators are reliable evaluators for musical creativity. This technique is encouraged not only for research purposes, but also in scoring composition in assignments, course work, or song writing competitions.

A shift towards student-centred activities and away from the traditional teacher-centred is suggested in the classroom. This study has proven that students could develop musical creativity abilities through the process of producing a composed music. In the Model of Creative Thinking Process in Music, Webster (1987) named composition as creative product. The thinking process to develop the creative product which is the composition according to Webster, need a dynamic process of alternation between convergent and divergent thinking. These abilities move in stages over time, enabled by enabling skills and by enabling conditions. In addition, the System Model of Creativity by Csikszentmihalyi (1998) proposed that for creativity to occur, the individual, the domain and the field must interact with one another. Hence, facilitate composition activities in the classroom will enrich the student's creative abilities as supported by these two theories. Encouraging student centred musical activities in the classroom is justified and is recommended.

Music educators should be aware of the positive influences of keyboard skills of the trainee teachers. This study found that the trainee teacher who has keyboard skills has higher musical creativity. The trainee teachers with keyboard grades have higher abilities in musical elaboration, craftsmanship, musical syntax, and musical sensitivity. Unfortunately majority of the trainee teachers in this study do not have any keyboard grades. The inclusion of keyboard lessons in the bachelor of teaching program should be continued and not replaced by other courses. For this reason keyboard learning should be encouraged at an early age. Though not directly related to this research, it is recommended that the keyboard be taught in the primary schools.

This study also found that the male trainee teachers are weaker in keyboard abilities compared to the female trainee teachers. Likewise, the Malay trainee teachers and the trainee teachers from other ethnic groups were weaker in keyboard abilities compared to the Chinese trainee teachers. These findings assist music educators in planning their keyboard lessons in order to ensure that the male trainee teachers and the Malay trainee teachers together with the trainee teachers of other ethnic group improve in their keyboard abilities.

The musical creativity of the trainee teachers was found to have no relationship with musical experiences which is contradictory to the findings by Laycock (1992). Laycock found that musical experience is a predictor of musical creativity. Auh (1995) found that informal experiences is the best predictor of musical creativity. The finding of this study could imply that the involvements in musical activities are viewed as not important in this bachelor of teaching in music education program. In this program, there were no incentives like extra marks or recognition for students who were involved in music co-curricular activities. There is no formal music co-curricular subject of music allocated in the structure of the program such as choir, *gamelan*, orchestra, or band. In the co-curricular course pro forma, music component was incorporated in the Culture Club. The lack of involvement of the trainee teachers in music activities could be one of the reasons why musical experiences of the trainee teachers have no relationship with musical creativity.

However, musical activities involvement is related to three components of musical creativity namely musical fluency, musical originality, and musical elaboration. Music teachers and music educators should encourage trainee teachers to participate more frequently in musical activities inside and outside the institutions. This study implies that a trainee teacher who participates in musical activities inside and outside of the institutions would be able to create fluent musical ideas that are original and are able to extend, reshape, and refine the musical elements. Hence, musical activities such as choir, gamelan, recorder ensemble, and band should be encouraged in the institutions.

The moderately high mean score for aural discrimination obtained in this study suggest a need to enhance aural skills among Malaysian music major trainee teachers. Aural discrimination is found to be the strongest predictor of musical creativity. Effort must be made to incorporate more musical activities into the curriculum structure of the teacher education program. Activities to improve aural and auditory-visual skills may facilitate the trainee teachers' musical creativity. The critical period for pitch identification is between age six to nine. By the age of twelve, the critical period of pitch identification would have passed (Zimmerman, 2011). Though not related to this study, the researcher recommends that aural skills should be incorporated into the preschool curriculum. Considering the age of pitch identification and its influence on musical creativity, it is critical to teach aural skills in preschool.

The finding in this study revealed that the Malay trainee teachers and also the trainee teachers from other ethnic groups were weaker in aural discrimination compared to the Chinese trainee teachers. This finding gives awareness to music educators to pay more attention to these groups of trainee teachers in their teaching of aural discrimination.

The results of this study provide evidence that the trainee teachers have moderate and low self-esteem of musical ability. Therefore, music educators, in the effort to built the trainee teachers' self-esteem of musical ability, should accomodate individual differences and address diverse needs. Music educators should create a comfortable atmosphere for students to built their self-esteem through performances such as individual and ensemble performances particularly to the female trainee teachers. This study found that the majority of the female trainee teachers had low self-esteem in musical ability. Consequently, this study found that self-esteem of musical ability correlates with musical creativity. It is hoped that these musical activities will increase the trainee teachers' self-esteem and subsequently improve their musical creativity.

The results of this study also provide evidence that male trainee teachers have higher musical creativity than female trainee teachers. It was found that the Chinese trainee teachers are more creative in musical fluency and musical elaboration than the Malay trainee teachers. Hence, again, musical educators should design classroom activities that may potentially enhance the female trainee teachers and the Malay trainee teachers to participate. When altering instruction to accomodate varied levels of abilities, music educators may promote successful musical experiences for all trainee teachers.

It is hoped that both researchers and music educators can plan, discuss, and implement activities that encourage trainee teachers to explore and teach creative concepts in the classroom to the present and future generations. Creating positive attitudes towards music to the trainee teachers and in turn to the students in the primary school is one of the most important thing a lecturer in Music Education may do and this turns out to be the most significant implication. Furthermore, this is in line with two of the six students' attributes in the Malaysia Education Blueprint 2013-2025 that is knowledge, and creative and innovative thinking.

5.5 Recommendation for Further Research

This study is one of the first local attempts to investigate the relationships between musical creativity and personal and performance among music major trainee teachers in Malaysia. Further research is needed to replicate this study of musical creativity at the college or university level. This is because the results of this study are inconsistent and contradictory with previous findings. Some of the independent variables needed to be re-examined. Gender should be re-examined for its relationships with academic grades and general creativity were inconsistent with results found in Yong's (1994) study on form four students. The subjects of the same age should be re-examined. Formal musical experiences such as the trainee teacher involvement in musical activity other than academic studies should be re-examined because this study found that musical activities have correlated with musical creativity which is contradictory to the finding of Auh (1995). Auh found a correlation with informal musical experience and musical creativity, and that, formal musical experience has no correlation with musical creativity.

Subsequently, musical creativity studies are relatively new in Malaysia. The definition of the construct of musical creativity and the different scoring criteria of musical creativity needs to be examined. The scoring criteria of musical creativity used in this study could have contributed to the differences in interpretation and the inconsistencies with previous findings. There is a need for direct replication of musical creativity research especially in music major students in the higher learning institutions.

The best predictor of musical creativity in this study is aural discrimination. Hence the findings strongly suggest that aural discrimination of the trainee teacher strongly influences his or her musical creative ability. It is recommended that further research be carried out to ascertain whether which component of aural discrimination plays the most important role in enhancing musical creativity. An intervention program using experimental design is recommended to investigate the methods of improving the aural discrimination of the trainee teachers.

The variables investigated in this study are not the only variables which may be related to musical creativity. The variables in this study were selected based on manageability and the adequacy of the research. Further research should include variables based on the social system approach. Csikzentmihalyi (1996) suggested viewing creativity as a phenomenon resulting from an interaction of field, domain, and individual. Variables such as family influence and peer influence towards musical creativity would allow researchers to understand the relative impact of socio-cultural variables on creative development. Longitudinal studies on the trainee teachers who are identified as musically creative in their teaching profession and have contributed to school and society in the context of music will be necessary.

This study is the first study of the nature of musical creativity in the local context. More studies using composition as the product of musical creativity replicated over samples covering a wide range of age groups and geographical area in Malaysia would help to establish the norms for a more accurate scoring of musical creativity. More studies related to the components and dimensions used to measure musical creativity in this study need to be carried out to confirm the validity of the measurement used in this study.

The sample of this study is limited to music major trainee teachers in teacher education institutions in Malaysia. The results obtained are neither generalisable to trainee teachers of other programs nor to the populations at large. Hence studies based on the same design should be conducted to include trainee teachers from various courses and from various institutions of higher learning.

This study focused on predictors for musical creativity. It sought to investigate factors that predict musical creativity. The findings of this study can be used as reference for future research and narrow the gap in the literature concerning musical creativity. However, it would be interesting to investigate what musical creativity can predict. For example, is musical creativity a predictor of academic achievements? What are the components in musical creativity which can influence academic achievements? Is musical creativity a predictor for creative performances? Further research expending the findings from this study can be developed in order to enhance musical creativity in the teaching and learning of music in the classrooms.

5.6 Closure

It is hoped that this study will add to the pool of documented literature on musical creativity and general creativity, and stimulate more research in this area so as to enable further understanding of the complex concept of creativity and the variables that affect its development in the local context.

This study has contributed to the body of knowledge by filling the gaps of findings concerning musical creativity and general creativity in the local context and non-local context. It documented the creative abilities of the music major trainee teachers in the teacher education institutions. It has also made known the musical exposures that enhance creativity especially musical creativity.