Music in Malaysian Higher Education: The Relationships among Personal-Environmental Factors and Measured Achievement of Students' Music Performance

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To my parents. With love, Pey.

Abstract

Music learning involves mastering a complex set of skills. Motivation is particularly important to this learning process, as considerable persistence and resilience is required. There are many empirical studies that show the importance of motivation, and the influences of environmental factors, on the development of music performance skills. However, these mostly focus on the school sector, and specific research in higher education settings is lacking.

This study investigates different factors that could impact on music students' learning processes and learning outcome in the context of Malaysian higher education. Hallam's (1998) *Model of Instrumental Music Learning* is adapted as the basic framework for exploring the relationships between students' motivation towards instrumental music learning, environmental factors (with a focus on parental factors), self-regulation and the measured achievement of performance. This model anticipates Biggs's *3P Model of Learning* (1987, 1999), describing music learning in three stages (presage-process-product). In addition, the relevant literature is reviewed, with a view to consolidating the theoretical bases that link the relationships between the factors identified for this study.

A mixed methods design is adopted, combining the strengths of quantitative and qualitative approaches. The quantitative data has been collected using two instruments developed on the basis of existing scales: The Music Student Survey Questionnaire, Malaysian Higher Education (2014), and the Music Performance Assessment Report. Several existing scales designed to measure self-concept, self-efficacy, personal interest, extrinsic motivation, parental involvement, and self-regulation have been adapted for use in the survey questionnaire. The music performance rating scale developed to collect achievement results for the Royal College of Music (RCM) in London has been adapted for use in the assessment report. These instruments were administered to 375 university music students and 33 examiners respectively, from seven universities. Semi-structured interviews were conducted with 19 students to collect qualitative data. Open-ended, theory-driven, and probing questions were prepared to gain an in-depth understanding of the factors that have an impact on students' music learning processes.

Ensuring rigour in research is crucial to yield meaningful and useful results. Statistical procedures including structural equation modelling using confirmatory factor

analysis, and Rasch Modelling are undertaken to validate the survey scales used in the quantitative component of this study. Various strategies including member checking, audit trail, and external/peer review are employed to ensure trustworthiness of the qualitative component.

Quantitative data analysis is carried out using the path analytic technique to investigate the postulated relationships among the factors considered in this study. The results suggest that highest qualification in music (e.g., ABRSM Grade 8) prior to entering university influenced students' achievement in music performance. The findings also show that students' level of expertise, parental factors, and motivational beliefs have significant impact on self-regulated learning. For the qualitative data analysis, a thematic analysis is conducted in order to identify and interpret the associations between significant themes/patterns that emerge from the interview data. Students indicate that parents, teachers, and university play an important role in their musical development.

The results of this study have important implications for the design of university music education and for the conduct of parent-teacher-student relationships, and may assist educators to improve and maintain students' motivation, and to enhance the quality of music learning experiences.

Declaration

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint award of this degree.

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Glossary

Confirmatory factor analysis (CFA)

A statistical technique used to determine whether the hypothesised factor model yields a variance-covariance matrix similar to the observed data (Schumacker & Lomax, 2016). It is a test level analysis carried out as part of the validation procedures to review the factor structure of the scales (i.e., macro-level analysis).

Expectancy x value theory

A theory developed by Atkinson (1947), and later expanded by Eccles (1983) and her colleagues into the field of education, which explains that students' motivation and achievement are determined by expectancies for success and values of the task. The four motivational constructs examined in this study based on expectancy x value theory are: self-concept, self-efficacy, personal interest, and perceived values.

Family socio-economic status

Family socio-economic status is measured by parents' education, parents' occupation, and home possessions, which is conceptualised as the financial, cultural, and social capital of a family.

Multiple regression analysis

A general linear modelling approach to statistical analysis of data that is used to predict and explain the relationship between the dependant variable (outcome) and multiple independent variables (predictor) (Schumacker, & Lomax, 2016).

Music performance achievement

A construct used to indicate that learning outcomes are successfully achieved by music students in the performance assessment situations. It is measured using music performance rating scale consists of a set of pre-defined assessment criteria.

Path analysis

A statistical analytic technique that is extended from multiple regression. It provides estimates of the magnitude (path coefficient) and significance (*p* value) of the hypothesised causal relationships among the observed variables in a theoretical model.

Perceived value

A construct associated with students' perceived importance and usefulness of engaging in an activity to achieve a goal.

Personal interest

A construct associated with students' motivation to engage in an activity because it is intrinsically rewarding or inherently satisfying.

Rasch model

A modelling approach developed by Georg Rasch in 1960. The Rasch model is based on probabilistic assumption that is constructed as a logistic function, placing person ability and item difficulty on a common scale, known as the logit scale. It is originally developed to handle dichotomous data (e.g., yes/no), but later extended to cover a range of situations including polytomous data (e.g., rating scale).

Rasch rating scale analysis

A statistical technique based on the Rasch measurement model and used to examine the psychometric properties of the measurement scales at the item level (i.e., micro-level analysis). It considers the characteristics of individual items in terms of how they meet unidimensionality requirements (i.e., that all of the observed variables reflect a single latent variable).

Reliability

Reliability refers to the measurement of consistency and the degree to which the observed scores are free from measurement errors (Miller, 2010). Reliability is a necessary condition for validity to ensure rigour in quantitative research.

Self-concept

Students' self-perceived ability, which combines their cognitive and affective states and involves social comparison (Bong & Clark, 1999).

Self-efficacy

Students' self-perceived ability. Self-efficacy differs from self-concept that it is primarily based on cognitive self-judgement of their abilities to succeed in a specific task (Bong & Clark, 1999).

Self-regulation

Students who are metacognitively, motivationally, and behaviourally active in their own learning process (Zimmerman, 1989) are said to exhibit 'self-regulation'. They apply specific learning strategies to achieve success in relation to their goals of learning (Winne & Hadwin, 2010). A self-regulation model consists of four dimensions: (a) method: task-oriented learning strategies; (b) behaviour: metacognition and orientations toward reflective thinking of own learning; (c) time management: ability to concentrate on task and plan the use of time effectively; and (d) help-seeking behaviour: tendency to seek help from others to improve learning (McPherson & Zimmerman, 2002; Miksza, 2012).

Students' motivation

Students' behaviours that are associated with their desire to learn, engagement in learning, persistence in learning, and their academic success.

Thematic analysis

A qualitative data analysis method used to identify key words, repeated ideas, and associations between the key words/repeated ideas in a body of textual data (Guest, MacQueen & Namey, 2012).

Trustworthiness

Quality of the qualitative study that is reflected by four criteria: (a) credibility: confidence in the 'truth value' of the findings and interpretations; (b) transferability: applicability of the findings in other contexts; (c) dependability: consistency of the findings; and (d) confirmability: the extent to which the findings and interpretations are reflective of participants' perceptions (Guba, 1981).

Validity

Validity refers to the extent to which a test is measuring what it purports to measure. Validation procedures are carried out to evaluate the psychometric properties of the instruments employed in a testing situation. Valid and reliable measures are important for making useful and meaningful inferences.

Abbreviations

AEC	:	European Association of Conservatoires
AERA	:	American Educational Research Association
APA	:	American Psychological Association
ASDQ	:	Academic Self-Description Questionnaire
CFA	:	Confirmatory Factor Analysis
CTT	:	Classical Test Theory
EFA	:	Exploratory Factor Analysis
EPU	:	Economic Planning Unit
HOMES	:	Home Musical Environment Scale
IEA	:	International Association for the Evaluation of Educational Achievement
IRT	:	Item Response Theory
ML	:	Maximum Likelihood
MNSQ	:	Mean Square
MPRS	:	Music Performance Rating Scale
MSI	:	Motivation Survey Instrument
MSLQ	:	Motivated Strategies for Learning Questionnaire
NAHME	:	National Association for Music in Higher Education
NCME	:	National Council on Measurement in Education
OECD	:	Organisation for Economic Co-Operation and Development
PCM	:	Partial Credit Model
PI	:	Parental Involvement
PIM	:	Parental Involvement Measures
PISA	:	Programme for International Student Assessment
PMD	:	Prime Minister's Department
RCM	:	Royal College of Music
RQ	:	Research Question
QAA	:	Quality Assurance Agency for Higher Education
RSM	:	Rating Scale Model
SDQ	:	Self-Description Questionnaire
SEM	:	Structural Equation Modelling
SMLIM	:	Student Motivation towards Learning Instrumental Music
SPSS	:	Statistical Package for the Social Sciences
SR	:	Self-Regulation

SRPBQ	:	Self-Regulated Practice Behaviours Questionnaire
TIMSS	:	Trends in International Mathematics and Science Study
UAHREC	:	University of Adelaide Human Research and Ethics Committee
VIF	:	Variation Inflation Factors
WLE	:	Weighted Likelihood Estimation

Chapter 1:
Music in Higher Education

1.1 Introduction

> Education in music is most sovereign, because more than anything else rhythm and harmony find their way to the inmost soul and take strongest hold upon it, bringing with them and imparting grace if one is rightly trained – Plato (427-347 BCE). (Mark, 2008, p. 5)

The value of music is clearly recognised in much empirical research (e.g., Catterall, Chapleau, & Iwanaga, 1999; Ewing, 2010; T. Vaughan, Harris, & Caldwell, 2011; Watson, 2007). Music is acknowledged, amongst other things, for its contribution towards the provision of powerful learning experiences for young people (R. Pascoe, Leong, MacCallum, Mackinlay, Marsh, Smith, Church, & Winterton, 2005). A review of existing research materials shows students' ongoing engagement in music has demonstrated positive effects on their perceptual and language skills, literacy skills, numeracy skills, intellectual development, general attainment, creativity development, social and personal development, physical development, health, and well-being (Hallam, 2010). Neuroscientists have also found scientific evidence that music related activities can stimulate a range of cognitive processes such as language and spatial-temporal reasoning (Donnelly & Limb, 2009; Edwards, 2008; Hodges, 1997). Furthermore, music has therapeutic functions (e.g., LaGasse, 2014; Moore & Hanson-Abromeit, 2015; Stephenson, Quintin, & South, 2016) and makes significant economic contributions such as job opportunities, music related products and musical events (GAP, 2011; Ministry of Higher Education Malaysia, 2010). Thus, this research has important implications in that it seeks to contribute to an effective, quality music education system.

The quality of music education in higher institutions is particularly important to support students in developing their individual artistic profiles, leading to prospective music careers. Although there are a variety of alternate career opportunities available to music graduates – disc jockey (DJ), classroom teacher, instrumental music teacher, solo artist, academic, orchestral musician, radio producer, band manager – and other innovative ways of integrating music into individual's career paths (Gaunt & Papageorgi, 2010), musicians' careers often remain unpredictable and financially unstable, due to employment opportunities being limited, and self-employment being the norm (Gaunt & Papageorgi, 2010; Holzenspies, 2009). Self-employed musicians often have to build up a portfolio that

combines a range of different skills (i.e., teaching, performing, and composing), or have a full-time occupation in another field (Hallam, 2014). This raises the question of what motivates music students, and more specifically for the purposes of this study, what motivates university music students to persist in their formal music learning, given such uncertain and often unstable career prospects. Instrumental music learning, in particular, requires a high degree of perseverance, to challenge oneself to strive for success and achieve music learning goals. Motivation is thus an important consideration within the context of music in higher education.

1.1.1 The Role of Higher Education

A female student, quoted in Johansson's (2012) study, expressed her concern about her future musicianship:

> Violinist. Musician. Artist. How do I see my profession, what are my goals and what is my responsibility? I have been playing the violin for 17 years and been a free-lance musician for 10 years. So many hours every day are spent on practice and technical development, but so seldom one thinks about the professional role. The artistry, the passion, the motivation and the engagement so easily disappear. Why did I choose to become a violinist? What is it in my creative work that makes me spend hours and hours in the practice room?
>
> I experience difficulties in feeling proud and secure as a musician. Spending hours finding faults in yourself is of course a necessary part of the technical development but then, on the stage, the crucial thing is to trust your competency and your interpretation. Now, when I am at the end of my education I feel that those parts are missing. (pp. 45-46)

In respect of my personal experience as a music student, a few years ago, I have a similar confession, "I entered university to pursue a degree in music, but was told that I was not talented enough at the piano and that I may not be able to graduate. It took me enormous effort to persist in my practice, while embracing the idea that I was not as good as other music students. Every day, I believed that I might fail my performance exam. I finally graduated, however I lost my interest and motivation to play the piano. I no longer have the confidence to perform, nor the courage to teach. What can I do with this degree to earn myself a living?" Like the extract from Johansson, this goes to the heart of the anxieties of being a musician. Addressing the changing nature of the music industry, and at the same time responding to the challenges and pressures involved in becoming a self-directed

musician, higher education is in a critical position to prepare students for their future professional music life.

In the current globalised, digitised era, music graduates need to equip themselves with multiple knowledges and skills if they are to stand out in the competitive job market (Ministry of Higher Education Malaysia, 2010). Higher education is responsible for "educating musicians who can carry and develop collective musical traditions and the challenge of providing fertile ground for the individual musicianship of those whose main passion concerns professional music making by giving them support, structure, guidance and knowledge" (Johansson, 2012, p. 46). In order to ensure that music degree programs are in keeping with the sophistication of society and the music industry, some countries have invested in developing standards for higher education. In the United Kingdom, the Quality Assurance Agency for Higher Education (QAA) (2008) specifies that music graduates are expected to master subject-specific skills (e.g., aural/analytical skills, performance skills, compositional skills, knowledge-based skills and technological skills), as well as transferable skills (e.g. intellectual skills, skills of communication and interaction, skills of personal management, and enhanced powers of imagination/creativity) at the end of the program. Cross disciplinary music programs (i.e., combining music with humanities disciplines, or technology) are also featured in QAA's statement, addressing the issues of employability (Gaunt & Papageorgi, 2010). In Europe, the *Tuning Project*, as part of the Bologna Declaration Process, which aims to develop comparable subject-specific program structures at the higher education level, has established reference points for the development and delivery of music degree programs ('Polifonia' Working Group, 2011). Music degree programs in Malaysia are a relatively recent initiative, but the government has produced a plan to chart the future directions of music in Malaysian higher education (Ministry of Higher Education Malaysia, 2010). The plan sets standards aimed at improving the quality of music programs, so as to facilitate students' musical development, promote independent learning, and foster students' motivation to continuously engage in music learning.

In addition to music program structure, music performance assessment is also addressed within the official standards for higher education development. Assessment is integral to learning and teaching, and is a measure of educational effectiveness. Assessment is indeed critical in terms of providing evaluative information about learning and teaching outcomes, and the effectiveness of the standards in ensuring the delivery of quality assured programs that meet the needs of contemporary students. As suggested by Lebler (2015):

> It is the assessment of music performance that is characteristic of higher music education, and the future of this form of assessment is in the hands of higher music education institutions which will need to respond to all kinds of pressures including increasing interest in comparability of standards between countries and institutions, various national requirements for structures and standards of education programs, the institutional policies of host universities, the established practices within institutions, the need to induct students into assessment to enhance their abilities as self-directed learners, and the core requirement of valid and reliable assessment. (p. 2)

Thus, much effort has been made to ensure that the music performance assessment system is fair, reliable, and aligned with the learning objectives.

Papageorgi and Hallam (2010) further suggest that the music performance assessment system, especially as it applies to graded assessment, can "promote motivation, enable comparisons to be made, provide a structure for learning, enable individuals to compete against their previous examination performance, and can provide some assessment of the effectiveness of teachers" (p. 151). Higher education, therefore, should not only provide quality music degree programs, but should also develop assessment systems that can effectively promote students' lifelong learning. Combining all the issues discussed above, this study focuses on examining the relationships between students' motivation and music performance achievement at the university level. The term 'music performance achievement' is used specifically to refer to formal assessment of music performance in the context of specified learning outcomes. The achievement is measured using a rubric which consists of a set of assessment criteria designed for the purpose of this study. Thus, it is a 'measured' achievement of students' music performance. The term 'music performance achievement' is employed throughout this study based on this operational definition.

1.1.2 The Importance of Students' Motivation

Students' motivation is imperative in the music learning process. In fact, many large scale international studies, such as the *Trends in International Mathematics and Science Study* (TIMSS) (e.g., M. O. Martin, Mullis, & Foy, 2008; Mullis, Martin, Foy, & Arora, 2012) and the *Programme for International Student Assessment* (PISA) (e.g., OECD, 2007; OECD, 2013c) have reported a positive relationship between students' motivation and academic achievement within science, mathematics, and reading subject areas. There have always been debates as to whether being able to play a musical instrument depends on one's innate ability. B. P. Smith (2011) argues that innate ability may not have a strong association

with motivational development, rather that motivation is essential to fully develop one's potential in music. Motivation is especially important in terms of sustaining interest, engaging the individual in deep learning, and supporting long term self-directed learning. McNamara, Holmes, and Collins (2006) report that renowned musicians perceived motivated behaviours, such as dedication, planning, commitment, attainable goal setting, and confidence, are necessary to the development of expertise in music performance. In addition, many music education scholars have conducted research on motivation in relation to various music learning processes and outcomes. For example, Hallam (2013), McPherson and McCormick (2006), and C. P. Schmidt (2005) examine the relationship between motivation and music performance achievement (also referred to as music performance quality in the literature); McPherson and Renwick (2011) study the relationship between self-regulation and mastering a musical instrument; C. P. Schmidt, Zdzinski, and Ballard (2006) research the association between motivation and long term career goal; and Nielsen (2004) and B. P. Smith (2005) investigate the link between motivation and musical practice strategy.

Motivation development is closely associated with various environmental factors. González-Moreno (2012) emphasises that the development of motivation is a function of individual characteristics and environmental influences, rather than determined genetically (nature), or shaped by life experiences (nurture), alone. This concept can also be found in many widely used frameworks, such as Bronfenbrenner's (1977) ecological model of human development and Bandura's (1986) social cognitive theory. The motivation model of instrumental music learning advanced by Hallam (1998, 2009) also shows how motivated behaviours are shaped through interaction with the environment. Hallam states, "some environmental influences are internalized to such an extent that they come to affect the individual's functioning over time in a fairly consistent way" (2016, p. 481). Therefore, a supportive environment is crucial to the development of motivation in instrumental music learning (Hallam, 2014), especially during the initial stages of the learning process (Swindells & de Bézenac, 2014).

Parents have a particularly significant role in initiating students' learning and engagement in music. Although this may not be the case for every music student, the positive influence of family factors is evident in many research studies (e.g., Davidson, Howe, Moore, & Sloboda, 1996; Wills, 2011; Zdzinski, 2002). Thus, in addition to students' motivation and music performance achievement (as mentioned in the previous section), the present

study also investigates the impact of family environment on students' musical development, in the hope of contributing to understandings that will facilitate improved music learning and teaching experiences in the future.

1.2 Statement of Problem

1.2.1 Current State of Research

The serious need for music research into higher education as a specific research area was put forward by Jørgensen (2010). A conclusion of his study is that carrying out research into university level music education as a 'new' and separate field is crucial, so as to inform institutions about factors influencing the quality and outcomes of their programs. This perspective is further endorsed by Broad and O'Flynn (2012), who observe that music education, to date, has largely focused on the primary and secondary levels of 'school music', and has been concerned with sub-disciplines, such as the generalist music teacher's education. They contend that one of the constraints on research at the university level was the "conception of higher education in the arts as constituting 'talent education', with an inevitable focus on performative capacity and development without due regard to other aspects of intellectual and professional formation and integration" (p. 2). It was one of the reasons that prompted the researcher to conduct this study. Nonetheless, there has been some effort made to address such concerns. The European Association of Conservatoires (AEC) has been leading research in areas relevant to the advancement of European Higher Music Education (see http://www.aec-music.eu/). The National Association for Music in Higher Education (NAHME), based in the United Kingdom, is also committed to the creation of a platform for sharing and exchanging ideas and experiences that aid in advancing music in higher education (see http://www.namhe.ac.uk/). In addition, a special issue of the journal, *Music Education Research, Volume 14, No. 1*, brings together a collection of research papers dedicated to higher education music research. Several books such as *Advanced Musical Performance: Investigations in Higher Education Learning* (Welch & Papageorgi, 2014), and *Collaborative Learning in Higher Music Education* (Gaunt & Westerlund, 2013), have compiled key ideas and provocative thoughts about current issues, contemporary learning theories, and advanced curriculum design in the field of music at the higher education level.

In expanding music education research into the higher education context, it is important that we use rigorous research methodologies. However, Overland (2014) reports that many (54%) of the quantitative studies published in the *Journal of Research in Music*

Education between 2000 and 2010 lack sufficient statistical explanatory power. He asserts that this may be caused by (a) low, unequal, or null sample sizes in individual comparison groups; (b) reliance on alpha correction procedures; (c) the use of incomplete data; and (d) violations of underlying assumptions. As quantitative method is the dominant approach employed in this mixed methods study, extra caution has been exercised to ensure the validity and reliability of the study. Additionally, Zelenak (2015b) reports that the number of music education research studies employing a qualitative form of inquiry was consistently less (≈ 30%) than quantitative studies (≈ 70%) from 1988 to 2009. This suggests the need to undertake more qualitative research to address current issues in music education through a different approach. The mixed methods design of this study includes a qualitative method component intended to capture the elaborated perspectives of the participants through information rich data.

1.2.2 Instrumental Music Education

The traditional one-to-one pedagogical method, or master-apprentice approach, has long been regarded as the most effective teaching strategy for instrumental music education at the university level (Gaunt, 2011; Latukefu & Verenikina, 2013). This approach involves teacher-centric transmission of knowledge to the student, and runs the risk of possibly limiting students' creative development and independence (Jørgensen, 2000). In order to prepare music students for a rapidly changing world, fostering a capacity for self-directed learning would appear to be a key priority in contemporary higher education (Latukefu & Verenikina, 2013). Teachers are in a pivotal position in respect of facilitating students' development as proactive participants in the learning process, both in and out of the classroom (Cassidy, 2011). Understanding students' motivational development can inform teachers in designing effective teaching methods to engage students in independent learning.

In addition, it is well known that becoming successful at playing a musical instrument requires a considerable amount of practice and commitment. Self-discipline, emotional control, failures, disappointments, self-doubt, physical pain and an extreme focus on achievement are all things one may grapple with in the effort to acquire performance expertise (Johansson, 2012). Further, graduates who pursue music as a professional career have to face a competitive, hard, and stressful professional life that has limited opportunity for individual choice (Johansson, 2012). Motivation is necessary in order to persist and develop the skills for successful instrumental playing careers (Clark, Lisboa, & Williamon, 2014). Existing studies indicate that students' musical motivation declines across school

years (e.g., Mota, 1999; Renwick & McPherson, 2009; Wigfield & Eccles, 2002; Wigfield, Eccles, Yoon, Harold, Arberton, Freedman-Doan, & Blumenfeld, 1997). Attrition rates also suggest a lack of success in retaining students' motivation to complete their music degree (González-Moreno, 2012). It is evident that developing behaviours associated with motivation is important to sustain students' successful involvement in music learning (Hallam, 2014; McPherson & Davidson, 2006). However, there are very few empirical studies regarding the relationship between university music students' motivation and their music performance achievement, and the contributing effects of environmental factors (González-Moreno, 2012), so research into this area is warranted.

While Triantafyllaki (2005) suggests that there was a dearth of research on instrumental music teaching, by 2012, Broad and O'Flynn had discerned a growing interest in the topic, although only a limited number of research papers had examined the content and experience of music teaching and learning at the higher education level. Jørgensen's (2010) study points to the fact that, among the music education research pieces he identified as addressing teaching and learning processes in higher education, studies pertinent to teaching account for 42% of the total and studies relating to other areas (e.g., entrance exam, and monitoring institutional quality) account for 33% of the total, whereas studies of student learning and development account for only 25% of the total. As the current paradigm in higher education has gradually shifted towards student-centred learning, with increased focus on student learning outcomes as the key to meaningful education (Tremblay, Lalancette, & Roseveare, 2013), it is crucial to build our understandings of students' learning processes.

1.2.3 Music Education in Malaysia

According to Jørgensen (2010), research into music in higher education has been mostly carried out in the United States, accounting for 68% of the total studies in his database. Malaysia, on the other hand, was the location of only one identified study, although music education research carried out within the primary and secondary context has been more extensive (e.g., M. H. Abdullah, 2013; Ghazali & McPherson, 2009; Nor, 2011; Tye, 2004). Given that the higher education system for music programs was only introduced 30 years ago in Malaysia, which is fairly recent compared to Western countries, there is a need to conduct more research, so as to assist educators and policy makers in improving the quality of teaching and learning at university level. Conducting more music-related research may

also serve as a mechanism to promote the relatively low status of music education in Malaysia (Ministry of Higher Education Malaysia, 2010).

Formal music education only became a compulsory subject in Malaysian elementary schools in 1983, and became available in secondary schools as an elective subject in 1988. The implementation of music as a school subject is in keeping with the stated philosophy of National Education to develop a holistic nation whose citizens are intellectually, spiritually, emotionally, and physically balanced and harmonious (Ministry of Education Malaysia, 2013, 2015). As stated in the *Malaysian Education Blueprint*, one of the aspirations is to ensure equal access to an education that enables every Malaysian student to achieve her or his full potential (Ministry of Education Malaysia, 2013, 2015). However, there has remained a question as to the place of music as a school subject in this context. In 1990, for example, J. Abdullah (1990) stated that:

> Music has yet to enter the formal curriculum in Malaysian high schools and universities, where it is treated only as an educational frill. Also, issues in music education like 'utilitarian function' and 'aesthetic education', which have been debated and discussed in the United States, are unknown in Malaysia. (p. 44-45)

Twenty years later these concerns are still being raised as an issue:

> Quite often parents are not very happy when their children get involved with musical activities in school as they are afraid this will affect their children's overall performance in the other important subjects such as Malaya language, English, Math and Science. (Nor, 2011, p. 220)

The concerns as quoted above, show the obvious need to advance the delivery of music education in Malaysia. In addition, Ghazali (2006) comments that extra-curricular music activities were not offered in most schools due to a lack of funding for purchasing new musical instruments and for maintain the existing ones. She further observes that this often leads to the need to enrol in private music classes, as the only alternative avenue for instrumental music learning. Many children have therefore missed out on music learning opportunities, as private music tuition can be prohibitively expensive.

The obstacles to attaining a comprehensive music education continue to present at the higher education level. A study commissioned by the Ministry of Higher Education Malaysia (2010) intended to chart the future direction of Malaysian tertiary music education found that:

> The effective implementations of music programmes in Malaysian tertiary institutions are hindered by various matters, among which include music not being

> considered by university management to be a priority. Many objected when it was first suggested that music be offered as a university course. Since then similar reasons for this objection continue with the perception of many that music does not require thinking but just feeling, that music is not a field of knowledge but is just entertainment. Affiliating music merely with the arts has also added to the perception that music is not important as the arts have always been considered as a frill and not a necessity such as the sciences. (p. 2)

In order to achieve continuous excellence in the higher education system, the *Malaysian Education Blueprint 2015-2025 (Higher Education)* outlined ten necessary shifts: holistic, entrepreneurial and balanced graduates; talent excellence; nation of lifelong learners; quality technical and vocational education and training graduates; financial sustainability; empowered governance; innovation ecosystem; global prominence; globalised online learning; and transformed higher education delivery (Ministry of Education Malaysia, 2015). The present study focuses on examining the relationships among students' motivation, environmental factors, and music performance achievement, endeavouring to provide evidence-based information that can help to develop holistic, entrepreneurial, talent excellence and lifelong self-reliant music graduates. It is also hoped that this study can facilitate policy makers in the Malaysian higher education sector in decision-making to advance the delivery of music education to students.

1.3 Significance of the Study

The major contribution of this study is the expansion of research in the field of music education, particularly in the Malaysian context as it was undertaken in this country. The study extends the understanding of students' music learning processes, based on established theoretical frameworks. It confirms the existing frameworks and presents new empirical evidence. The study also adheres to Jørgensen's (2010) urge to conduct music research in higher education as a specific area. Furthermore, this study offers new perspectives in music education within the Eastern context, which is underexplored (Hallam, 2009), because the research is carried out in Malaysian settings.

In addition, the present study also makes a significant methodological contribution. A quantitative research instrument, which conforms to the psychometric properties of validity and reliability, has been developed. The instrument consists of scales that can be used to measure students' motivational beliefs, home environmental factors, and the quality of music performance. This can serve as foundational work for future expansion to include other

scales measuring other factors that have impact on students' musical development. The instrument can also be adapted in other disciplines. Additionally, this study employs a contemporary modelling approach, the Rasch model, to examine the utility of the research instrument. The application of the Rasch modelling approach confirms feasibility in the field of music education and contributes to the understandings of how it is best implemented in this context. Further details about the Rasch model are discussed in Chapter 4.

1.4 Aims of the Study

The primary aim of this study is to examine students' motivation in relation to their music performance achievement within the Malaysian higher education context. This aim also includes exploration of the relationship between students' motivation and their home learning environment (i.e., parental involvement and family socio-economic status). To investigate the complex relationships among the variables of students' motivation, home learning environment, and music performance achievement, a mixed methods approach has been employed. Quantitative and qualitative methods have been used in a complementary fashion, enhancing the objectivity of the research through the quantitative study, and acquiring deeper understanding of the issues through the lens of the qualitative study.

1.5 Research Questions

To achieve the aims and objectives of the study, a structured set of research questions has been formulated. The main research question seeks to address the relationships between the factors derived from students' expertise level, motivational behaviour, home environment, self-regulation, and music performance achievement. The supplementary research questions can be categorised according to four broad headings: (a) students' level of expertise; (b) students' motivation and self-regulation; (c) home learning environment; and (d) social environmental factors. The research questions have been developed based on the influence of each of these aspects on other identified factors, as guided by the theoretical framework employed in this study (see Chapter 2). The first category of questions seeks to determine factors such as program year level, highest qualification in music prior to entering university (e.g., ABRSM Grade 8), and average practice hours per day. The second category is concerned with students' motivational behaviour in terms of self-perceived ability and subjective task value, and different dimensions of students' self-regulation. 'Self-perceived ability' refers to students' self-perceptions of their musical ability and 'subjective task value' refers to students' perceived values of music. Self-regulation is briefly defined as the self-

regulatory approach adopted in music practice routine that is divided into four dimensions in this study. The third category includes parental involvement and family socio-economic status. The fourth category considers the potential existence of other environmental factors, apart from home environmental factors. A full list and comprehensive descriptions of the factors included in these categories are provided and discussed in the following chapters. It should be noted that some of the questions put forward are broad, hence, requiring them to be divided into more specific sub-questions.

1. *Students' level of expertise*
    a) What is the relationship between students' level of expertise and their motivation towards instrumental music learning?
        - Does students' level of expertise have an effect on their self-perceived ability in terms of self-concept and self-efficacy?
        - Does students' level of expertise have an effect on subjective task value in terms of personal interest and perceived value?
    b) Does students' level of expertise have an effect on their self-regulation?
    c) Does students' level of expertise have an effect on their music performance achievement?

2. *Students' motivation and self-regulation*
    a) What is the relationship between students' motivation and their self-regulation towards instrumental music learning?
        - Does students' self-perceived ability in terms of self-concept and self-efficacy have an effect on their self-regulation?
        - Does students' subjective task value in terms of personal interest and perceived value have an effect on their self-regulation?
    b) What is the relationship between students' motivation and their music performance achievement?
        - Does students' self-perceived ability in terms of self-concept and self-efficacy have an effect on their music performance achievement?
        - Does students' subjective task value in terms of personal interest and perceived value have an effect on their music performance achievement?
    c) What is the relationship between students' self-regulation and their music performance achievement?

3. *Home learning environment*
    a) What is the relationship between parental involvement and students' motivation?
        - Does parental involvement have an effect on students' self-perceived ability in terms of self-concept and self-efficacy?
        - Does parental involvement have an effect on students' subjective task value in terms of personal interest and perceived value?
    b) What is the relationship between parents' socio-economic status and students' motivation?
        - Does parents' socio-economic status (highest level of education, musical background, and home musical possessions) have an effect on students' self-perceived ability in terms of self-concept and self-efficacy?
        - Does parents' socio-economic status (highest level of education, musical background, and home musical possessions) have an effect on students' subjective task value in terms of personal interest and perceived value?
    c) How does parental involvement influence students' self-regulation?
    d) How does parents' socio-economic status influence students' self-regulation?
    e) How does parental involvement influence students' music performance achievement?
    f) How does parents' socio-economic status influence students' music performance achievement?

4. *Social environmental factors*
    a) What are the factors that are associated with students' motivation towards instrumental music learning, other than the hypothesised factors as specified in research questions 1, 2, and 3?

1.6 Overview of the Thesis

This thesis is divided into eight chapters presenting in turn the background, rationale, methodology, results, and implications of the study. Chapter 1 puts together the background, aims, and significance of this study and provides a rationale for the need to conduct this research. Additionally, research questions are outlined in Chapter 1 to serve as a fundamental core that guide the current study. This is followed by Chapter 2 where the literature review identifies the current research gaps, which provide the underpinnings of the research question. Chapter 2 also includes a conceptual framework.

A mixed-methods approach is employed in this study and discussed in Chapter 3. The quantitative approach presents a macro-perspective of the study topic while qualitative data supports the quantitative findings, providing a deeper understanding of the study topic from a micro-perspective. Chapter 3 also includes information on ethics clearance, sample selection and settings, instrument design, pilot study and a brief introduction on data management and analyses.

As this is a mixed-methods study, careful consideration is given in reporting validity of the instrument (quantitative) and trustworthiness of the study (qualitative). It is imperative to ensure that the reader can synthesize and understand the links between quantitative and qualitative studies in terms of methodological considerations, analysis procedures, and results. Thus, from Chapter 4 to Chapter 7, the discussions are presented in the order of quantitative approach to qualitative approach for each chapter.

Chapter 4 addresses the methodological considerations required to ensure the quality of the mixed methods study (i.e., rigour of the research process and accuracy of the data collected). The concepts and approaches used to examine the quality of quantitative and qualitative data are described. For quantitative study, it is associated with the validation procedures used to examine the validity and reliability of the instrument; for qualitative study, it is associated with the various strategies used to ensure trustworthiness of the study. This is followed by Chapter 5 which presents the results of the procedures and strategies employed to examine the quality of the study.

In Chapter 6, the analytic techniques used in the mixed methods study to answer the research questions are described. The descriptions of the analytic techniques employed and analysis procedures carried out for quantitative and qualitative study are discussed in detail. Chapter 7 reports and discusses the results of the analyses performed based on the procedures as described in Chapter 6. The qualitative findings reported following the quantitative findings in Chapter 7 provide for further, in depth understandings of the findings of the quantitative study.

Chapter 8 summarises and discusses the findings of this study in light of the research questions outlined in Chapter 1. This chapter draws together the key findings, implications of the study, limitations of the study, recommendations for future research, and personal reflections of the researcher.

1.7 Summary

This chapter highlights the current issues in instrumental music learning, which provide the rationale for, and emphasise the need to, undertake the current study. This includes the concerns of sustaining students' motivation in music learning, the important role of higher education in facilitating student learning, and the challenges of instrumental music learning. In addition, there is the problem of a lack of music education research specific to the higher education context.

Malaysia was chosen as the study location because a limited amount of research has been carried out there, and university music education is fairly new. Researching in Malaysia also can be valuable in providing insights into the issue from non-western cultural perspectives.

Based on the issues discussed, this study aims to explore the impact of personal-environmental factors on students' learning processes and achievement in music performance assessment, in order to help in understanding music students' learning processes. While extending the scope of music education research, this study also makes a significant methodological contribution in respect of the use of contemporary statistical methods in the music education field. The mixed methods approach employed draws on the strengths of quantitative and qualitative research methods.

The following chapter provides a literature review of the factors considered in this study and the theoretical framework employed to examine the relationships among these factors.

Chapter 2:
Literature Review

2.1 Introduction

The vital need for music education research specific to the higher education context to facilitate the design of effective teaching approaches and quality programs by universities has been discussed in the previous chapter. The present study focuses on various factors that impact students' music learning processes and outcomes.

This chapter begins with presentation of the theoretical framework employed to guide the study. This is followed by a literature review of the factors considered. The review highlights the relationships between the factors that have been investigated in this study, and those discovered in previous research. The research gaps identified in the review support the need for the current research. In addition, the review draws attention to the different definitions of terms employed by scholars in this field. This, in turn, facilitates the consideration of definitions specific and appropriate to the context of this study. Finally, a summary of this chapter is provided.

2.2 Conceptual Framework

A conceptual framework is necessary to link and explain the relationships among the factors to be examined. The model shown in Figure 2.1, adapted from Hallam's (1998) *Model of Instrumental Music Learning*, is employed to guide this study. Although there are other models and theories developed to describe music learning process, Hallam's model is chosen as it has an overarching structure that displays and links various factors that have impact on music learning. In particular, this model anticipates Biggs's *3P Model of Learning* (1987, 1999). The 3P model is Biggs's conceptualization of approaches to learning which describes student learning based on three stages: presage, process, and product. According to the model, students' personal characteristics, motives to learn, and environmental factors in the *presage* stage can affect students' ongoing approaches to learning in the *process* stage, which in turn influence their learning outcomes in the *product* stage (Biggs, 1987). The 3P model has been adopted in many research studies up to date to explore and understand students' learning approaches in different areas (e.g., Barattucci, Pagliaro, Cafagna, & Bosetto, 2017; Clinton, 2014; Zhang, 2000). Similarly, Hallam's model contextualised Biggs's 3P model in music learning.

For the current study, based on Hallam's model, the relationships between factors in music learning are outlined in presage-process-product stages:

a) The presage stage consists of factors that present before learning takes place. The presage factors considered in this study are student characteristics and home environmental factors that may influence students' approaches to learning instrumental music. Student characteristics include level of expertise and students' motivation. Home environmental factors include parental involvement and family socio-economic status.
b) The process stage is associated with students' approaches to learning. The process component comprises students' self-regulation. In instrumental music learning, students' learning approaches are their self-regulated learning strategies/approaches adopted for their musical practice.
c) The product component is learning outcome, which is the measured achievement of music performance.

The adapted model postulates that the interactions between student characteristics and home environmental factors could have an impact on students' self-regulated learning approaches, which in turn affect their music performance achievement. Additionally, student characteristics and home environmental factors are predicted to have a direct impact on students' achievement in music performance. Although the impact can be bi-directional, however, due to time constraints, the research carried out to investigate the relationships between factors from one stage to another is one-directional. This adapted model, as shown graphically in Figure 2.1, establishes a framework that can be used to explore the relationships between factors influencing music learning to answer the research questions of this study.

In the following sections, a literature review of the factors examined in this study is provided. The factors are discussed according to the sequence of the model adapted (Figure 2.1) from presage (student' motivation, parental involvement, and family socio-economic status) to process (self-regulation) to product stage (music performance achievement). This facilitates the discussion and understanding on how the factors link to each other.

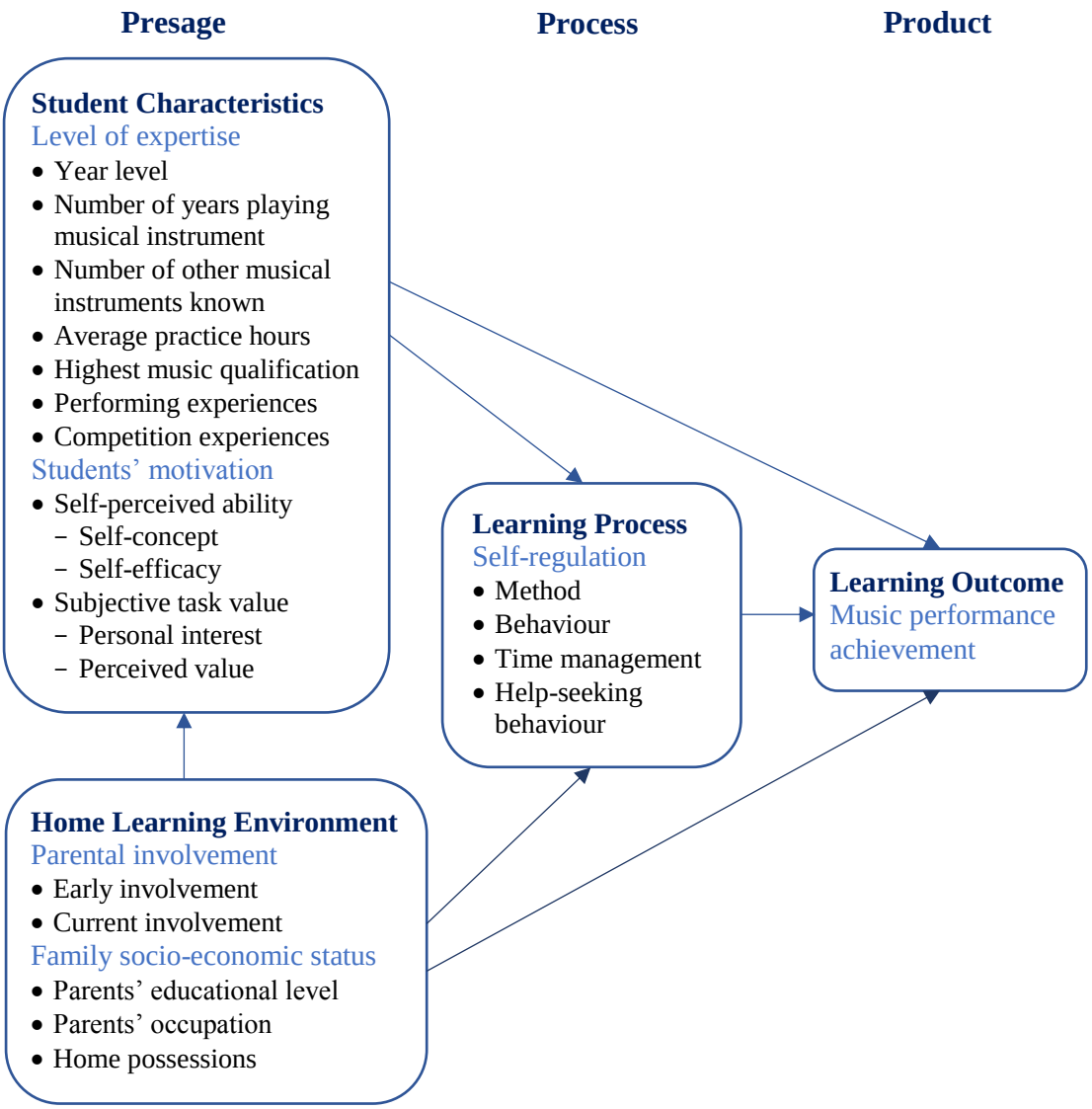


Figure 2.1. Model of instrumental music learning based on Hallam's model (1998).

2.3 Students' Motivation towards Learning Instrumental Music

Motivation has been a topic of interest in different subject areas (e.g., Chang, 2015; Guo, Parker, Marsh, & Morin, 2015; Jones & Wilkins, 2013; Skaalvik, Federici, & Klassen, 2015). Motivation, as defined by Ely and Rashkin (2005) in the *Dictionary of Music Education*, is "a psychological term used to explain behaviour initiated by needs and directed toward a goal. In general, motivation is what causes individuals to behave in certain ways" (p. 274). With the advancement of social psychology studies, the concept of motivation is extended and elaborated through various frameworks and empirical theories, such as reinforcement theories (Skinner, 1953; Thorndike, 1932), need theories (Hull, 1943;

McClelland, 1985), expectancy x value theory (Atkinson, 1957; Eccles, 1983), self-determination theory (Deci, 1980), and self-efficacy theory (Bandura, 1971, 1982). These motivation frameworks and theories have been used to study and understand the differences in students' behaviours that contribute to their success within the education context. Researchers have found that motivation is closely associated with academic success, students' desire to learn, and engagement in learning in subject areas such as language (e.g., Dörnyei, Csizér, & Németh, 2006; Haggerty & Fox, 2015; Masgoret & Gardner, 2003), mathematics (e.g., Carr, 1996; Pajares & Graham, 1999; Skaalvik et al., 2015), and science (e.g., Bryan, Glynn, & Kittleson, 2011; Chang, 2015; Mettas, Karmiotis, & Cristoforou, 2006). Similarly, as shown in music research (e.g., Cogdill, 2015; González-Moreno, 2012; McPherson & McCormick, 2000), motivation is an important element in helping students persist, engage, and achieve success in learning and developing musical skills.

Motivation was chosen as a topic of inquiry in this study because learning to perform music is unique, in that continuous enthusiasm and effort are required to master a complex set of musical skills simultaneously (i.e., aural skill, cognitive skill, motor skill). According to McPherson and Renwick (2011):

> As with other skills, however, mastering a musical instrument involves many challenges. Learners need to apply themselves over long periods of time, to be able to focus their attention (particularly in demanding performance situations), to cope with the challenges of a competitive learning environment, to bounce back from setbacks inherent in the learning process, to overcome periods of self-doubt and performance slumps. … (p. 234)

Moreover, Renwick and Reeve (2012) claim that:

> Learning to perform music can be a very enjoyable, satisfying, and meaningful undertaking. … [However], in the lives of many music students, practicing may take on a role akin to a homework-like task: a daily chore to be completed alongside many others, often under the surveillance of parents. (pp. 143-144)

The need for motivation to sustain long term commitment in music learning is amplified especially when music is not considered a core academic subject in many countries.

The motivation to undergo arduous practice in order to master music performing skills is reflected in four behavioural patterns: choice and preference, intensity, persistence, and quality of engagement (Linnenbrink-Garcia, Maehr, & Pintrich, 2011). The varying degrees of these behavioural patterns provide a depiction of students' motivation to learn

music. Examples of the behavioural indicators of motivation are given by Linnenbrink-Garcia et al. (2011), as illustrated in Table 2.1.

Table 2.1. Examples of behavioural indicators of motivation.

Behavioural Indicators	Academic	Musical
Choice and Preference	Choosing to enrol in an advanced science class	Choosing to practise the piano instead of watching television
Intensity	Focusing all of one's attention on solving algebra equations	Focusing all of one's attention on practising a difficult passage
Persistence	Continuing to work on writing a report for social studies even when it becomes difficult	Continuing to practise the flute after rehearsal ends
Quality of Engagement	Monitoring one's understanding of a novel and rereading portions until one understands	Finding aspects of a piece that are difficult to play and working on those passages until they can be played correctly

Note. Original source from Linnenbrink-Garcia et al. (2011).

In his early social psychology works, Atkinson (1957) suggests that "people weight the incentive value of the desired outcome with the expectancy that it would actually occur" (cited in Bargh, Gollwitzer, & Oettingen, 2010, p. 268), and this cognitive process is a function of expectancy and value which relates to the motivation to choose and perform tasks of varying difficulty (Linnenbrink-Garcia et al., 2011). The expectancy x value model was subsequently advanced by Eccles (1983) and her colleagues, becoming a widely used theory to explore motivation in educational settings. They propose that expectancy and value (a) are the most immediate predictors of achievement performance and choice, (b) are influenced by a variety of factors within the educational contexts, and (c) influence choice, persistence, engagement and performance (Wigfield & Cambria, 2010). As one of the prominent motivation theories in the field of education, in this study the expectancy x value model is considered to provide a framework for understanding students' motivation towards learning to perform music in relation to other environmental factors, and performance achievement.

Expectancy refers to students' beliefs about how well they will perform on a task currently or in future. Eccles and her colleagues propose that expectancy is directly influenced by students' self-concept of ability (Eccles, O'Neill, & Wigfield, 2005; Eccles & Wigfield, 1995; Wigfield et al., 1997), a proposition which was later adopted and expanded in many motivation research studies (e.g., Chen, Yeh, Hwang, & Lin, 2013; Marsh & Martin, 2011; Randles, 2010). This self-concept of ability refers to students' self-evaluations of their own competence or abilities, and in terms of assessment and in comparison to other students (Wigfield & Cambria, 2010). This concept is extended and modified in other ability beliefs-related theories such as self-efficacy theory (Bandura, 1977, 1982). Both of these constructs – self-concept and self-efficacy – are interest in this study, which is designed to explore students' beliefs in relation to their ability in music.

Value refers to subjective task values which are defined as four different components, as proposed by Wigfield and Eccles (2000):

a) *Attainment value or importance*. The importance of doing well on a given task.
b) *Intrinsic value*. The enjoyment one gains from doing the task.
c) *Utility value or usefulness of the task*. How a task fits into an individual's future plans.
d) *Cost*. The decision to give up on other activities and the anticipated effort needed to accomplish a given task. (p.72)

The first three components are chosen to explore the extent to which students in this study value music learning. The cost component is excluded, because it consists of negative elements such as cost of failure (i.e., the sacrifice needed in order to engage and achieve success in a given task) (Eccles et al., 2005). In this study, the intrinsic value component is labelled as personal interest construct, because it is similar to intrinsic motivation which describes students' interest in music learning; and the attainment and utility value components are labelled as perceived value construct which is similar to the concept of extrinsic motivation to study why succeeding in music is important and how useful music is for the students in this study.

The following sections discuss in further detail the four constructs used to explore students' motivation towards learning instrumental music.

2.3.1 Self-Concept

Self-concept has a long history in educational research, beginning with the pioneering work of William James (1890). However, Shavelson, Hubner, and Stanton (1976) raise concerns regarding the lack of consistent findings and sound theoretical framework in the initial works relating to the notion of self-concept (J. Martin, 2010). Their work proposes a new theoretical model of self-concept, defining it as "a person's self-perceptions formed through experience and interpretations of one's environment. It includes feelings of self-confidence, self-worth, self-acceptance, competence, and ability. It is influenced especially by evaluations by significant others, reinforcements and attributions for one's own behaviour" (Marsh & Scalas, 2010, p. 660). Shavelson et al.'s (1976) effort provides a foundation and preliminary definition for much subsequent self-concept research (Marsh & Scalas, 2010; J. Martin, 2010), especially in the construction of the self-concept structure model by Marsh (1990b). Marsh's measurement instruments of self-concept, Self-Description Questionnaire (SDQ) and Academic Self-Description Questionnaire (ASDQ), are adapted in many contemporary research studies of self-concept (e.g., K. C. Leung, Marsh, Craven, & Abduljabbar, 2015; Lohbeck, Nitkowski, & Petermann, 2016; Simons, Capio, Adriaenssens, Delbroek, & Vandenbussche, 2012). It has been suggested that SDQ and ASDQ are the strongest measures of self-concept of different dimensions (i.e., academic self-concept, social self-concept, emotional self-concept, and physical self-concept) (Marsh & Scalas, 2010).

There are two types of self-concept that are most studied by researchers: general/global self-concept and domain-specific/academic self-concept. In educational settings, academic self-concept is well embraced because results show better correlation with achievement compared to global self-concept (Marsh, 1992; J. Martin, 2010). Many studies carried out in different subject areas and countries provide evidence that academic self-concept (e.g., mathematics self-concept) is associated with its corresponding academic achievement (e.g., mathematics achievement) (e.g., Chen et al., 2013; Huang, 2011; Marsh, 1990b; Marsh & Martin, 2011) .

In the field of music, there is a dearth of empirical studies that specifically examine self-concept as it relates to music achievement and other music-related outcomes. Researchers have associated the notion of self-concept with other terms, such as self-esteem and self-worth. However, the definitions of these terms need to be addressed with care. Current research studies have found positive relationships between: music competition, self-

concept, and music performance achievement (Austin, 1988); self-concept and music achievement (Austin & Vispoel, 1998; Hedden, 1982); self-concept, motivation, interest, and participation in school and out of school musical activities (Austin, 1991; Klinedinst, 1991); and compositional experiences and self-concept (Randles, 2010). In addition, it has been found that students' music self-concept appears to decline as they grow older (McPherson & O'Neill, 2010; Mota, 1999). Hallam (2009) suggests that the reason could be due to students becoming increasingly aware of their own musical ability through making comparisons and receiving feedback. This results in decreased self-concept when they are making comparisons with others who have higher achievement, and are receiving negative feedback. These findings advocate for the importance of conducting studies related to music students' self-concept at the university level so that informed decisions can be made in relation to teaching approaches that promote sustained engagement in music learning and successful learning outcomes.

2.3.2 Self-Efficacy

Self-efficacy is a division of self-concept, denoting one's beliefs in one's own ability. Albert Bandura, who introduced the theory of self-efficacy in 1977, defines it as:

> Beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments. … Such beliefs influence the course of action people choose to pursue, how much effort they put forth in given endeavours, how long they will persevere in the face of obstacles and failures. … (Bong & Skaalvik, 2003, p. 5)

Although self-concept and self-efficacy are similar, conceptually, these two constructs have specific characteristics that differ from each other. The distinctions between these two constructs, and examples to illustrate the differences, are presented in Table 2.2.

Table 2.2. Differences between self-concept and self-efficacy.

Self-Concept	Self-Efficacy
Domain-specific	Task-specific
E.g., their perceptions about their abilities in music	E.g., their beliefs about their abilities to perform given musical pieces
Individuals' general perceptions of the themselves in given domain functioning	Individuals' expectations and convictions of what they can accomplish in given situations
E.g., judgment of whether they are competent to master a musical piece	E.g., judgement of how strongly they believe they can master a musical piece in one month's time

Incorporate both cognitive and affective state towards themselves and involve social comparison	Primarily based on cognitive judgment of their abilities
E.g., how they feel and evaluates themselves according to standards and in comparison to others in the music learning situation	E.g., emphasises their perceived abilities of themselves to successfully perform the given musical piece on stage within a set time frame
Stronger prediction of constructs related to their evaluative and affective concerns	Stronger prediction of academic performance and achievement
E.g., anxiety and intrinsic motivation	E.g., music performance achievement
Remain stable over time	Vary according to situation
E.g., their beliefs about their competence in music remain the same over time	E.g., they may have different efficacy beliefs depending on the difficulty level of the given musical piece to learn

Note. Summarised from Bong and Clark (1999) and Bong and Skaalvik (2003).

To provide a general sense of the differences between the two concepts described above, self-concept involves self-perception of abilities at playing a musical instrument while self-efficacy involves explicit judgement of possessing particular musical skills necessary to perform a specific piece of music within the given time frame (Linnenbrink-Garcia et al., 2011). These differences suggest the necessity to examine self-concept and self-efficacy separately as they may differently influence learning progress and outcomes. Specifying the differences between these two forms of students' self-belief is useful in terms of increased predictive and explanatory power in relation to students' behavioural intentions and academic performance (Bong & Clark, 1999).

In Bandura's (1982, 1989a) social cognitive theory, he contends that perceived self-efficacy beliefs act as a mediating mechanism that can influence human behaviour patterns, actions, and emotional arousal, which help to determine academic performance. People with a high level of efficacy beliefs tend to approach difficult tasks as a challenge, maintain strong commitment to achieve their goals, and prepare to approach difficult tasks (Schunk & Pajares, 2010). These effects have been shown in several studies in various subject areas such as mathematics, writing, and science (e.g., Jiang, Song, Lee, & Bong, 2014; Malte, Ronny, & Ulrich, 2015; Pajares, 1996; Pajares & Miller, 1995; Phan, 2012; Sawtelle, Brewe, & Kramer, 2012; Villalón, Mateos, & Cuevas, 2015).

Similarly, in the field of music education, the effects of self-efficacy in association with students' motivational behaviours and achievement outcomes have been examined in a large collection of research studies to date. There have been statistically significant results indicating that self-efficacy appears to be a strong predictor of music performance achievement in the context of students aged between 9 and 18 years (McPherson & McCormick, 2006), secondary-level band students (Hewitt, 2015), and undergraduate music students (Ritchie & Williamon, 2012). This is because high levels of self-efficacy increase students' use of strategies to encounter task difficulties and ensure persistence. As suggested by Pajares (1996), "self-efficacy beliefs act as determinants of behaviour by influencing the choices that individuals make, the effort they expend, the perseverance they exert in the face of difficulties, and the thought patterns and emotional reactions they experience" (p. 325). The predictive power and impact of self-efficacy have also been supported in music self-efficacy research in other contexts besides music performance achievement, such as the relationship between self-efficacy and practising strategies (Nielsen, 2004), improvisation instruction model and self-efficacy (Davison, 2010), and mastery experience and self-efficacy (Zelenak, 2015a). The complexities of self-efficacy, intertwined with students' motivational behaviours and achievement, encapsulate the need to investigate the direct and mediating effects of self-efficacy in this study, and especially to address the differences between the self-concept and self-efficacy aspects of self-belief.

2.3.3 Personal Interest

The personal interest construct employed in this study is associated with the intrinsic value component classified under the value aspect of the expectancy x value theory. Personal interest is conceptualised as an individual's enduring predisposition for learning a certain domain or about certain topics, and his/her re-engagement over time (Austin, Renwick, & McPherson, 2006; Hidi, Renninger, & Krapp, 2004). Showing interest in an activity, helps to reduce the need to make a conscious effort to persist fully in the activity (Areepattamannil, Freeman, & Klinger, 2011). The foundation of interest theory can be found in John Dewey's *Interest and Effort in Education*, published in 1913. Dewey defines the term 'interest' as an individual "being engaged, engrossed, or entirely taken up with some activity because of its recognised worth" (Dewey, 1913, p. 17). He further elaborates that interest has sufficient force to drive a person to contribute effort and persist in an enduring activity that brings progressive growth and success. Interest research has gained attention since the prolific work published by Hidi (1990), who highlights the facilitative effect of interest on cognitive functioning and learning based on existing evidence. He also proposes the distinction

between personal interest (interest that develops over time) and situational interest (interest evoked by stimuli in the environment). Hidi's work contributes to the growing body of research and literature on the topic of interest (e.g., Bergin, 1999; Wade, 2001), and the development of different models of interest (e.g., Hidi & Renninger, 2006; Krapp, 2005; Schiefelé, 1996) (Ainley, 2010).

Many studies have found that interest is associated with motivational behaviours such as choice and persistence, knowledge acquisition and academic performance (e.g., Ainley, Corrigan, & Richardson, 2005; Bøe, 2012; Köller, Baumert, & Schnabel, 2001; Larson, Stephen, Bonitz, & Wu, 2014; Leibham, Alexander, & Johnson, 2013). In the instrumental music learning situation, students' interest is extremely important, as their enjoyment in learning and practising music – which may be somewhat arduous and boring – could be the driving force behind motivation to persist and engage in learning. As shown in a case study conducted by (Renwick & McPherson, 2002), a 12-year-old student clarinettist was observed practising a particular piece with a high level of attention, persistence, and strategy use, both because the student had chosen the piece herself (situational interest) and because of her emerging personal interest in jazz (personal interest). Another case study conducted by B. W. Leung and McPherson (2011), based in Hong Kong, indicates that high achievers in music generally express great interest in music learning because of five main factors: aesthetic feelings, self-recognition, sense of achievement, music preference, and enjoyment. In addition, Rosevear (2007, 2008, 2010) finds that enjoyment is the key reason for year 9 and 10 students in Adelaide, South Australia, achieving success in music. C. P. Schmidt also reports in his studies (2005, 2007) that intrinsic motivation is associated with ratings of performance, effort, and students' self-reported practice time. Furthermore, the importance of intrinsic interest in relation to cognitive strategies used in practice, and long term commitment to playing music, are highlighted in studies conducted by McPherson himself, and with his colleague, McCormick (McPherson, 2001; McPherson & McCormick, 1999, 2000). Parkes and Jones also find that interest serves as a function in predicting the choice of undergraduate music education students (2012) and music performance students (2011) to pursue a career in music performance.

Despite the extensive research related to interest in music, there are not many empirical studies that investigate the role of interest in music learning within the higher education context. Hence, this study considers the need to explore the impact of interest on

students' learning process and outcomes, and how the development of interest is influenced by environmental factors.

2.3.4 Perceived Values

'Perceived values' as a term is operationalised in this study as part of the value aspect of the expectancy x value theory, which includes attainment value and utility value. Both of these values are similar to the notions of extrinsic motivation, where individuals engage in an activity in order to obtain external outcomes such as praise, a reward, or the avoidance of punishment (Austin et al., 2006). Rather than pursuing an activity for inherently rewarded satisfaction, an extrinsically motivated individual engages and persists in an activity because the activity is instrumental in reaching goals to which he/she aspires or to avoid undesirable consequences (Levesque, Copeland, Pattie, & Deci, 2010). To be more specific, attainment value and utility value are conceptually similar to the identified and integrated regulation components of motivation in Ryan and Deci's (2001) self-determination theory. The identified regulation involves "people identifying with the personal value and importance of the behaviour for themselves and thus accepting it as their own", and integrated regulation involves "people having integrated new identifications with other aspects of their own integrated sense of self – that is, with other identifications, values, and needs" (Deci & Ryan, 2001, p. 488). Identified and integrated regulation are reflected in attainment value (Wigfield & Cambria, 2010), where engaging in an activity (i.e., music practice) is important in achieving a goal (i.e., graduating from a music degree matching with one's identity as a student), and utility value, where engaging in an activity (i.e., practising difficult music) is useful in succeeding in relation to a future goal (i.e., obtaining a music career as a successful musician).

Eccles and her colleagues, having conducted extensive empirical studies based on expectancy x value model, find that achievement task values, both intrinsic and extrinsic, predict students' intentions and actual decisions to persist and engage in a particular subject (Eccles et al., 2005; Wigfield & Eccles, 1992, 2002). In addition, utility value is associated with academic performance as shown in existing empirical studies (e.g., Cole, Bergin, & Whittaker, 2008; Durik, Vida, & Eccles, 2006; Hulleman, Godes, Hendricks, & Harackiewicz, 2010). In the field of music, Lehmann, Sloboda, and Woody (2007) have concluded that extrinsic sources of motivation such as parents' verbal praise and encouragement, teacher's encouragement, and peer pressure can foster students' commitment to music and provide a foundation for lifelong music involvement. Similarly,

Renwick (2008, cited in Renwick & Reeve, 2012) suggests that extrinsic motivation may motivate a student to make minimal effort to engage in practice. He indicates that although intrinsic motivation may be the main driver of engagement in learning, extrinsic motives, such as the desire to avoid failure and to obtain a teacher's approval, may inspire students to engage in effective music practice that is not inherently enjoyable. Additionally, B. W. Leung and McPherson (2011) report that high achievers in music perceived music to be useful as entertainment, as a future career, and for performance and technique advancement.

As reported in studies conducted by Eccles and her colleagues, young children may not be able to fully distinguish the different components of task values (intrinsic and extrinsic values), however, the ability to differentiate improves as they grow older (Wigfield & Eccles, 2002). The reason could be because they begin to perceive the importance and usefulness of music when they arrive at future goal planning and approach the time for career decision-making, especially within the university music education context. The perceived importance of achieving success in music for university music students, as investigated in this study, in particular, may determine their intensity in task engagement affecting their self-regulation and achievement.

2.4 Parental Involvement and Socio-Economic Status

In the present study, the impact of parental involvement (parents' participation in children's music learning processes) and parents' socio-economic status (measures of family's financial, social, and cultural status) are examined. As discussed in the previous sections, the development of motivational behaviours (self-concept, self-efficacy, personal interest, and perceived values) is inseparable from the influence of a variety of environmental factors. Bandura (1989a) describes social cognitive theory as a model of emergent interactive agency, suggesting that:

> Persons are neither autonomous agents nor simply mechanical conveyers of animating environmental influences. Rather, they make causal contribution to their own motivation and action within a system of triadic reciprocal causation. In this model of reciprocal causation, action, cognitive, affective, and other personal factors, and environmental events all operate as interacting determinants. (p. 1175)

The parental role is especially crucial in that it accounts for important variability in developing students' motivation to learn music, as well as their desire to persist in music learning. The powerful influence of parents on their children's musical development is also depicted in many iconic figures in Western music, as in the cases of prolific and influential

musicians: Wolfgang Amadeus Mozart, Clara Schumann, Yehudi Menuhin, and Jacqueline du Pré (Creech, 2009). Discussions on the importance of the parental role in music education can be traced back to as early as 1945, when Shinichi Suzuki first introduced the well-known philosophy of Talent Education, also known as the Suzuki Method, which is still widely adopted in current early music education. Suzuki (1973) suggested that in order to nurture a child's talent in music, parents have a responsibility to:

a) Educate their child as early as possible;
b) Give their child as much training as possible;
c) Create the most favourable environment possible;
d) Provide their child with the best possible teacher; and
e) Adopt the best educational method. (pp. 14-15)

In the other words, parents play a key role in supporting children's music learning and shaping their positive attitudes towards music by providing them with high quality music education and creating an encouraging home music learning environment.

The influence of parental involvement on students' learning is evident in international large-scale studies, such as *Programme for International Student Assessment* (PISA). The PISA report indicates that active parental engagement throughout childhood has a positive impact on students' reading ability, their motivation to learn, and their interest and enjoyment in reading (OECD, 2012a). Another recent study (Sha, Schunn, Bathgate, & Ben-Eliyahu, 2016) suggests that family support is associated with early adolescents' choices for, and engagement in, science learning, mediated by their interest and self-efficacy in science. In addition, there are numerous studies on the relationships between parental involvement, home learning environment, academic engagement, and academic achievement (e.g., Cheung & Pomerantz, 2012; Fan & Williams, 2010; Galindo & Sheldon, 2012; Khajehpour & Ghazvini, 2011). In the context of music, empirical studies have shown the important influence of parental involvement on students' motivation in music, their musical development, and achievement (e.g., Brand, 1985; Davidson et al., 1996; B. W. Leung & McPherson, 2011; Sichivitsa, 2007; Wills, 2011; Zdzinski, 1992, 2002, 2011). However, Zdzinski (1996) indicates that the relationship between parental involvement and students' music achievement is only significant at the elementary level, in comparison to the junior and senior high school level. He suggests that this difference might be caused by the age factor, as less parental support is needed with older students. However, this result may vary in different contexts, such as cultural and educational. As there is a dearth of research within the higher education context, this study explores the influence of parental involvement

during students' childhood years, and their current learning in university, on their motivation, strategies used for learning, and achievement.

As mentioned above, different cultures can account for different parental involvement practices. Hallam (2009) asserts that:

> Music is not valued equally in all cultures. In some it is viewed as decadent and is forbidden, in others it is highly valued and those involved in its composition or execution are highly revered members of society. … In the Western world some individuals learn to play an instrument because it is expected by their family or school. Others start by chance because tuition is on offer in school or their friends have decided to play. (p. 290)

Barnes, DeFreitas, and Grego (2016) report that there are significant differences shown for home musical environment and music participation at home for students in Brazil and the United States. Thus, empirical studies should be undertaken in order to examine the effects of parental involvement within different cultures on students' musical development, in order to provide a broader perspective with regards to this area, as it could have implications for parents and teachers in their encouragement of lifelong music learning.

Apart from parental involvement, the learning environment at home is often associated with family socio-economic status, which is typically measured by parents' education, parents' occupation, and home possessions, which serve as a source of financial capital, cultural resources, and social capital transmission (Buchmann, 2002). Well-educated parents tend to ensure that their children are able to become successful and independent individuals in future by providing them with favourable and better education (Vellymalay, 2011; Yang & Gustafsson, 2004); parents' occupations are found to determine their children's expected future occupation and are indicative of their financial ability to provide better education (Buchmann, 2002; Dahl & Lochner, 2012); and the possession of educational resources at home is cultural capital which stimulates students' musical development (Buchmann, 2002; Davies-Kean, 2005). In the music education field, there is a lack of empirical studies about the effect of family socio-economic status on students' motivation and achievement (e.g., Brand, 1986; McClellan, 2011; Wills, 2011). Additionally, there is a research gap in how the effects of family socio-economic status carry over to influence students' music learning at the university level. Hence, family socio-economic status is included as one of the examined factors in the current study. Exploring the impact of family factors is imperative. The results can help parents and educators gain a better understanding of students' musical

development processes, and how to enhance their learning experiences through informal music educational settings.

2.5 Student's Self-Regulation

Practice is essential in learning a musical instrument; it enables the learner to develop necessary musical skills, maintain existing skills, learn new music pieces, and prepare for performance (Hallam, 1998). Music students are normally expected to devote a great amount of time practising independently and effectively, in addition to their formal music lessons. Motivation is extremely important to sustain the student through the frustration, boredom, fear, and solitude encountered during practice, and to provide continued aspiration after success or failure in performance (B. P. Smith, 2011). The motivational factors and family factors, as discussed above, are closely related to students' self-regulation. Self-regulated learners, as defined by Zimmerman (1989), are "metacognitively, motivationally, and behaviourally active participants in their own learning process" (p. 329). They apply specific learning strategies (e.g., set goals and create environments that optimise learning) that they predict will provide success in relation to their goals of learning (Winne & Hadwin, 2010; Zimmerman, 1989, 1990). Although motivation and self-regulation are closely related, motivation differs from self-regulation in that motivational theories seek to explain "students' choice of activities, the intensity or quality of their effort, and their persistence at academic activities" using constructs such as self-perceived ability, values, interests, or self-determination (Wolters & Mueller, 2010, p. 631). Self-regulation describes the actions and thoughts engaged by students to manage their motivation to commit and achieve their academic goals (Wolters & Mueller, 2010). In the other words, self-regulation is exerted as a mediator that links students' motivation and their striving to attain academic goals. Thus, self-regulated learning processes are assumed to be influenced by environmental (e.g., quiet study area) and personal (e.g., self-efficacy) factors (Zimmerman, 1989). Environmental and personal factors could heighten self-regulated learning strategies used to strive for success.

From the above perspective, it can be seen that students' motivation and ideal learning environment at home are vital to the development of self-regulation, resulting in improved music learning outcomes (McPherson & Renwick, 2011). When students value tasks, feel competent to complete tasks, and perceive that accomplishing tasks is instrumental to achieve material gain, self-regulation is energised to facilitate their learning (Boekaerts, 2010). Nielsen, who has undertaken a series of research projects related to self-regulated

learning in music students, finds that self-regulation is correlated with self-efficacy (2004), task goal and ability-avoidance goal (2008), and epistemic beliefs (2010). McPherson and Renwick (2011) also indicate that students' self-regulation (e.g., plan of practice and adapting appropriate practice strategies) is significant in attaining mastery of musical skills. In addition, self-regulation is associated with intrinsic motivation (Miksza, 2006) and positive practice habits (McPherson & McCormick, 2006; Miksza, 2011). As existing music self-regulation research is mostly conducted within the primary and secondary sectors (e.g., Harnischmacher, 1997; Miksza, 2012; Miksza, Prichard, & Sorbo, 2012; Sloboda, Davidson, Howe, & Moore, 1996; Williamon & Valentine, 2000), there is need for more research within the higher education context.

McPherson and Zimmerman (2002) propose that a model of self-regulation pertinent to music learning consists of six dimensions: motive, method, time management, behaviour, physical environment, and social factors. Miksza et al. (2012) suggest that of these six dimensions, method, behaviour, and time management are the three most important, representing issues of resource management, metacognitive strategy use, and adaptive learning strategies. *Method* refers to "task-oriented learning strategies, mental strategies and other general approaches to self-instruction"; *behaviour* refers to "orientations toward reflective thinking, metacognition, and learners' abilities to self-evaluate or monitor their own learning processes"; and *time management* refers to "students' abilities to concentrate, focus on tasks, and plan the use of their time" (Miksza, 2012, pp. 322-323). In addition to the three major dimensions, *social factors*, which refer to "a learner's tendency to engage others through help-seeking behaviours" (Miksza, 2012, p. 323), are assessed as part of the self-regulation construct in this study. *Motive*, which refers to students' self-beliefs that may affect their learning (Miksza, 2012), is assessed as a separate construct from self-regulation, as it is considered a pre-condition of influencing students' self-regulation. *Physical environment*, which refers to "the physical structure in which learning takes place", is excluded, as it is frequently beyond students' control (Miksza, 2012, p. 323). The number of music education studies that explore the impact of self-regulation and employ a self-regulation specific framework is limited. Thus, the current study takes up a self-regulation framework as proposed by McPherson and Zimmerman (2002), and adapted in Miksza's (2006, 2012) studies.

2.6 Music Performance Assessment

In music performance, assessment allows students to demonstrate their skills at playing a musical instrument. The assessment outcomes, referred to as music performance achievement in this study, have significant implications for music teaching and learning. Students' achievement can facilitate the evaluation of educational effectiveness. Therefore, it is imperative to ensure the quality of the assessment for fair, transparent, valid, and reliable assessment processes and outcomes. Various measures have been established to assess the quality of music performance using numbers to achieve the objectivity requirement. However, there are many concerns such as "what do the numbers mean?", "how do we use the numbers?", "are they valid measures?", and the most important question, "can we really assess a music performance that essentially requires subjective judgement using objective measures?" In contrast, if the assessment depends solely on examiners' subjective judgement, it raises the issues of fairness, transferability, and comparability of the assessment outcomes.

Gordon (2002) argues that, although, historically, it was believed that achievement in music performance cannot be measured objectively, objectivity and subjectivity are on the same continuum. This perception is supported in Wrigley's (2005) study; quality assessment can be achieved through the concept of intersubjective objectivity by seeking a balance between objectivity and subjectivity. The existence of intersubjective objectivity is established through consensus, using a set of specific measures of music performance criteria and standards to obtain objectivity, while acknowledging the evaluation process is essentially subjective (Wrigley, 2005). In other words, assessment criteria are developed to guide the judgement of the performance quality in order to increase the fairness of the assessment. This approach is evident in many studies (e.g., Ciorba & Smith, 2009; Gordon, 2002; S. Thompson & Williamon, 2003; Wesolowski, 2012; Wrigley & Emmerson, 2013). Further, the psychometric properties of the measures in terms of validity and reliability are important in ensuring the meaningfulness and usefulness of the music performance assessment results. Factor analysis is a popular statistical procedure employed to examine validity and reliability of the measures. However, the contemporary approach, Rasch analysis, which offers several advantages over factor analysis, is rarely employed in music performance assessment research (e.g., Bond & Bond, 2011; B. J. Pascoe & Waugh, 2001). The need to examine validity and reliability, and the modelling approaches employed for validation procedures, are discussed in further detail in Chapter 4.

2.7 Summary

Hallam's (1998) *Model of Instrumental Music Learning* is adapted as a basis to guide the current study to answer the research questions as outlined in Chapter 1. The research questions aim to explore the relationships between the factors derived from students' motivation towards learning instrumental music, home learning environment, self-regulation, and measured achievement of music performance. A literature pertinent to these factors including related theories, definitions used in this study, interrelationships between the factors, and the extent to which these factors have been studied by previous researchers is highlighted in this chapter.

As evident in previous research, students' motivated behaviours are particularly important for their sustained engagement in music learning and their goal of becoming self-directed, flexible, and innovative musicians. Research studies suggest that self-perceived abilities, and the value of music learning as an internal reward (interest) and external reward (attainment and utility values), influence students' persistence and engagement in learning.

The development of motivation is closely associated with various environmental factors. The parents' role is crucial in students' musical development, because parents can provide an environment suitable for music learning. Studies identify that parents' participation in children's music learning activities affects their musical interest and desire to persist in learning. In addition, parents' socio-economic status, as a source of social and financial capital, is associated with creating musical cultures at home and providing support for their children's learning.

Students' motivation and parental factors contribute to the development of self-regulation. The theory suggests that self-regulated learners employ specific learning strategies to engage in effective musical practice, which subsequently affects learning outcomes. In this study, learning outcomes refers to the achievement in music performance assessment. The achievement is measured according to a set of criteria for the purpose of this study.

The literature examines these factors primarily within the primary and secondary school contexts. This literature review has established that there is a need to carry out research in the university sector to provide an understanding of students' music learning processes specific to the higher education context. There is also a lack of studies that provide

perspectives within an Eastern cultural context. To acknowledge the importance of gaining insights from a different cultural context, this study was undertaken in Malaysia. A mixed methods approach is used to explore the relationships between the factors discussed above. Specifically, the quantitative approach is used to examine the hypothesised model of relationships and the qualitative approach is used to provide a deeper understanding of the complex relationships between these factors. The mixed methods research design employed in this research study is discussed in the following chapter.

Chapter 3:
Research Methods

3.1 Introduction

This chapter describes the research methods employed in this study. The chapter begins with a discussion of the significance of mixed methods approaches and how these enable the researcher to answer the research questions as unambiguously as possible (Creswell, 2012; Kirshenblatt-Gimblett, 2006). The data have been collected from undergraduate music students in Malaysia. The survey questionnaire and music performance rating scale have been developed to collect quantitative data, and a semi-structured interview guide constructed so as to facilitate the interview process with students. These research instruments were pilot tested to ensure the feasibility of the study. A description of the procedures employed to establish the study's rigour is presented. A brief note on the data analysis techniques is also outlined. The chapter concludes with a summary.

3.2 Choice of Methods

The focus of this study is to investigate the effects of a range of factors on the measured achievement of students' music performance. These factors include students' motivation towards learning instrumental music, home musical learning environment, and students' self-regulation, factors that are based on current associated research literature. By employing a mixed methods approach, the research questions of this study can effectively be addressed through combining the strengths of both quantitative and qualitative research methods. Creswell (2015) defines mixed methods research as:

> An approach to research in the social, behavioural, and health sciences in which the investigator gathers both quantitative (closed-ended) and qualitative (open-ended) data, integrates the two, and then draws interpretations based on the combined strengths of both sets of data to understand research problems. (p.2)

Hence, the combination of quantitative and qualitative approaches does not only provide useful information regarding the interrelationship of the identified factors for this study using statistical analysis procedures, the qualitative data can also provide a deeper understanding of the results gained from the statistical analysis.

The mixed methods design lies within a distinctive framework that has specific characteristics that differentiate it from other research methods. There are several criteria to

be considered when creating mixed methods research typologies (Creswell & Plano Clark, 2011):

a) The implementation process (e.g., concurrent, sequential, and multilevel)
b) Priority of methodological approach
c) Functions of the research study (e.g., triangulation and complementarity)
d) Number of study phases (e.g., single study and multiple phases).

The typologies of this study are based on the embedded mixed methods design, which involves collecting quantitative and qualitative data simultaneously, however one form of data has a supportive role to the other form (Creswell, 2012). In this study, the quantitative approach is given priority as the major form of data collection. The quantitative approach highlights the macro-perspective of the study topic through providing an overarching view of the relationships among the factors considered for this study. This is achieved by testing the hypothesised model that outlines the relationships. The qualitative data is used to support the quantitative findings and provide deeper understanding of the study topic, as well as alleviate any shortcomings of the quantitative methods. Thus, the qualitative approach is complementing the quantitative approach, enabling micro-perspective research that takes into account individuals' viewpoints. Thus, the use of mixed methods combines the strengths of quantitative and qualitative approaches that supports the investigation on the study topic in greater detail.

3.3 The Underpinning Research Paradigm

Paradigm is referred to "as systems of beliefs and practices that influence how researchers select both the questions they study and methods that they use to study them" (Morgan, 2007, p. 49). Thus, it is necessary for the researcher to delineate the underpinning paradigm that guides the present study. Johnson and Gray (2010) suggest that mixed methods researchers:

a) Believe that the human world is composed of multiple realities;
b) Attempt to learn from differences and create new syntheses;
c) Seek for balance and integrate the benefits derived from multiple perspectives;
d) Examine multiple perspectives and create research design that can address the research problems effectively; and
e) Are biased towards 'dialectical pragmatism'.

Dialectical pragmatism is the philosophical stance proposed by Teddlie and Johnson (2009), and tailored to support mixed methods research. The word 'pragmatism' emphasises the

search for middle ground between philosophical dogmatism (see Table 4.1 in Teddlie & Johnson, 2009, for detail explanations) and the term 'dialectical' refers to the incorporation of perspectives from both quantitative and qualitative paradigms to create a 'workable solution' for research problems (Johnson & Gray, 2010). The study follows this particular paradigm so as to create a research design that utilises the benefits of both quantitative and qualitative approaches and is considered effective in addressing the research questions.

3.4 Ethics Clearance

The importance of ethical conduct during research cannot be overstated. Thus, it was necessary for the researcher to seek ethics clearance from The University of Adelaide Human Research and Ethics Committee (UAHREC) before this study could proceed to data collection. As this study focused on the Malaysian higher education context, there was also the need to seek approval from the Malaysian government through its Economic Planning Unit (EPU) to conduct research in that country. There were different ethics application procedures for research conducted in Peninsular Malaysia, Sarawak, and Sabah. Separate applications were made seeking approval from the EPU of each of these areas, respectively. A detailed flow chart that explains the application process to conduct research in Malaysia is included in Appendix B (see p. 210). Furthermore, ethics clearance from targeted universities (i.e., those that offered music degree programs) was sought.

The UAHREC approved this study on the 6th March, 2014 (ethics approval number: H-2014-040). The EPU from the Prime Minister's Department (PMD) in Peninsular Malaysia granted approval for this study on the 26th February, 2014 (reference number: 40/200/19/3097). This approval was revoked later when issuing a new approval on the 19th November, 2014 (reference number: 40/200/19/3097(5)) which combined the separate applications to conduct research in Peninsular Malaysia, Sarawak, and Sabah. This complication was due to a development in EPU at the time of application for approval. Individual approvals from the universities were sent through email or confirmed through phone conversation, but formal approval letters were not issued. The EPU requested a preliminary report following data collection, and a copy of the research findings, as part of the approval granted for this study. See Appendices A, C, and D for ethics approval documents.

3.4.1 Participants' Consent

Information sheets were given to the participants to provide details relating to (a) the purpose of this study, (b) the possible impact of this study on them, (c) the voluntary nature of participation, and (d) the researcher and her supervisors being the only individuals with access to the information collected. The confidentiality of the participants was assured by storing collected materials that contained identifying information in a secured place to which only permitted persons (as indicated in the information sheet) had access. In addition, participants' names were replaced with numbers at an early point in the analysis, and no personal information is included in this thesis or in any publications deriving from data obtained in the course of the study. Except for the interview, for which participants signed a separate consent form, students and examiners who participated in the survey and rating of students' music performance were considered to have consented to participate in the study when they completed and returned the survey questionnaires and music performance scoring rubric, respectively. This was indicated in the participants' information sheet. The participants' information sheets, consent form, and complaints information sheet are included in Appendices E, F, G, and H.

3.5 Sample Selection and Data Collection

3.5.1 Sample Selection

This study's population has been broadly defined as music students enrolled in a Malaysian tertiary institution. Specifically, this population has been divided into two groups: (a) bachelor degree students who were enrolled in a music course that required them to learn and perform a musical instrument as well as undertake music performance assessment at the end of the academic semester, and (b) examiners appointed by the universities to assess students' music performance at the end of the academic semester.

In mixed methods research, the researcher is required to decide a mixed sampling design that considers the relationship of the quantitative and qualitative data produced (Collins, 2010). Teddlie and Yu (2007) propose five types of mixed sampling design: basic mixed sampling strategies, sequential, concurrent, multilevel, and a combination of mixed sampling strategies. Sequential mixed sampling is employed in this study, such that "the implementation of one component (e.g., quantitative) follows the other component (e.g., qualitative), and the relationship between the two components is dependent" (Collins, 2010,

p. 363). Different sampling techniques, such as random and purposive sampling techniques, have been implemented for each component during each phase of data collection.

The samples for the quantitative component are selected according to the procedures and criteria of purposive sampling. Purposive sampling is a non-random sampling technique which involves "seeking out specific individuals meeting specific criteria to participate in a research study" (Hibberts, Johnson, & Hudson, 2012, p. 67). The rationale for applying this sampling technique instead of the originally planned random sampling was to maximise potential participation, so as to overcome the limitations of having a very limited number of universities that offered music programs and, therefore, an equally limited number of music students. The consideration of a minimum sample size was required in order to achieve meaningful and interpretable results from statistical procedures employed to analyse quantitative data. Thus, all the possible participants (i.e., music students) who met the criteria (specified above) were invited to participate in this study.

According to Onwuegbuzie and Collins (2007), selecting samples for each phase of a study by identifying the relationships between quantitative and qualitative samples is part of the mixed sampling design. The participants of the qualitative study were drawn from the pool of students who participated in the quantitative data collection phase of the study. Onwuegbuzie and Collins (2007) classify this as a nested sample in which the sample chosen for one phase of the study (i.e., qualitative) represent a subset of sample participated in the other phase (i.e., quantitative). The participants were selected with care to include a range of characteristics (e.g., year level, musical instrument types).

The sampling procedure began by identifying a list of Malaysian universities that offered music programs. Subsequently, the researcher contacted the administrative department and the head of the music department of the universities from the list to request participation in this study through email, phone calls, and in person. After the universities agreed to participate in the study, further details regarding data collection procedures were discussed. The following section provides more details about the data collection procedures.

3.5.2 Data Collection Procedures

Three forms of data have been collected for this study: student survey, student interview, and music performance assessment. Students were recruited to participate in survey questionnaires, modified from existing instruments, to measure the factors examined

in this study. Participating universities facilitated the administration of the surveys by providing a suitable schedule for the researcher to distribute the questionnaires to the students and, then, collect the questionnaires from the students on the same day. In the cases where the presence of the researcher was not appropriate, the university's staff members facilitated the survey administration process. The survey design was chosen because of its efficiency in collecting data from a large number of participants for statistical analysis (Creswell, 2012). Using the survey design also had the advantage of collecting data about attitudes, beliefs, opinions, and practices to examine the relationship between these variables and predict outcomes (Creswell, 2012).

Students were asked to indicate their willingness to participate in an interview session at the end of the survey questionnaire. The researcher purposively selected from these willing students to capture a diversity of perspectives from different program year levels and musical instrument types. The selected students were contacted, based on the contact details provided, for the purpose of scheduling face-to-face interview sessions. Each of the interviews lasted from approximately five to fifteen minutes and was audio recorded. The interview focused on the impact of the home learning environment on the development of students' musical interests.

Students' music performance assessment data were collected during their end of academic semester's on-stage performance assessment. Examiners employed by the universities were recruited to assess students' music performance. Examiners who agreed to participate in this study used the music performance scoring rubric provided by the researcher to rate students' music performance. Examiners completed the rating process as an addition to the routine marking required by their respective institutions.

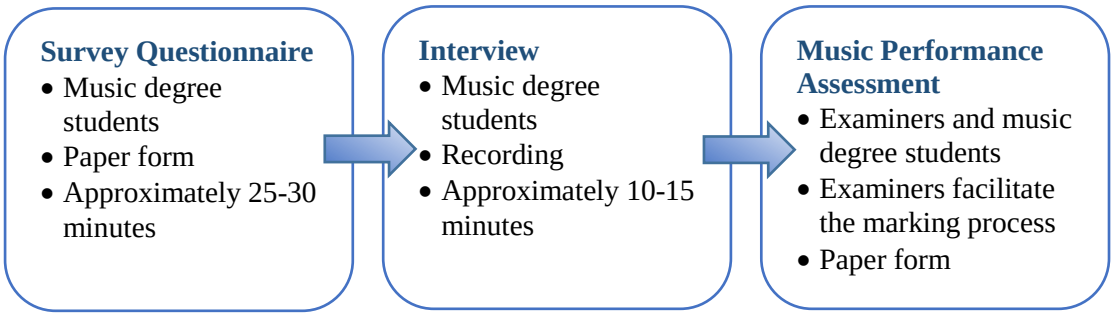


Figure 3.1. The sequence of data collection.

3.6 Instrument Design

The instruments employed to collect data in this study consist of a survey questionnaire, music performance rating scales, and a semi-structured interview guide. For quantitative instruments, several scales from previous established instruments were examined to determine their suitability for use in achieving the goals of this study. Items were chosen with care, as some of the items from the existing instruments addressed aspects that were not of concern in this study. Items selected were slightly modified to suit the need of this study within the higher education sector, because the existing instruments were mostly developed for research within the primary and secondary school levels. Minor modifications were also needed to ensure that the English language used in the questionnaire was accessible for Malaysian students who learned English as a second language. Likert scales were utilised to collect quantitative data. Many researchers have studied the effects of the number of response categories in Likert scales/ratings scales (e.g., Parducci & Wedell, 1986; Preston & Colman, 2000; Revilla, Saris, & Krosnick, 2014); however, there are no definite conclusions about the optimal number of categories. The number of categories in this study was determined with the aim of achieving a suitable compromise between, on the one hand, clarity and speed and ease of use for the participants, and, on the other, sufficient richness of data to produce insightful results. On these grounds, a five-point level of agreement scale, and a four-point frequency scale, based on the empirical support, were appropriate for this study (OECD, 2013a; Preston & Colman, 2000; Revilla et al., 2014).

The interview aimed to establish a deeper understanding of the study topic and allow new perspectives to emerge (Fletcher, 2015). This was achieved through open-ended conversations intended to provide a micro-view of students' real life experiences and perspectives (Cohen, Manion, & Morrison, 2007). Semi-structured interviews were used in this study as this approach offered a balance between the flexibility to explore students' individual 'voices' and a focus on gaining insights specific to the study topic consistently across the whole group of interviewees. A semi-structured interview guide was developed to facilitate the interview process. The following section describes the development of the instruments and interview guide used in this study.

3.6.1 Survey Questionnaire

The survey questionnaire consists of four major sections:

a) Demographic information
b) Student motivation towards learning instrumental music
c) Parental involvement
d) Self-regulation.

Further detail regarding the close-ended items and scaled instruments are presented in the following sections.

3.6.1.1 Demographic Information

Students' personal information and home musical learning environment are part of the focus of this study. Demographic information such as student's age, gender, music degree program (i.e., music performance), principal musical instrument, level of expertise (i.e., total years of learning the principal musical instrument, number of other musical instruments known how to play, performing experience, the highest level of qualification in music[1] before entering university), and total average hours of practice per week are included. In addition, parents' occupation, highest education level, musical background, and home musical possessions are included as part of the family socio-economic status measure. The home musical possessions scale measures students' early home musical learning environment through the musical resources available at home. The home musical possessions scale has been adapted from the home possessions scale from *Trends in International Mathematics and Science Study* (TIMSS) 2011's Student Questionnaire, and *Programme for International Student Assessment* (PISA) 2009's Student Questionnaire. As TIMSS and PISA's Student Questionnaires are designed to measure home possessions in terms of science, mathematics, and literacy, items have been modified to suit the musical context of this study.

3.6.1.2 Student Motivation towards Learning Instrumental Music Instrument

The student motivation towards learning instrumental music (SMLIM) instrument has been developed to measure students' motivation towards learning musical instruments determined by their various observable behaviours. The SMLIM instrument consists of four scales designed to measure students' motivation: self-concept, self-efficacy, personal

[1] Qualification in music refers to the graded examination system for music from 1 to 8. Grade 1 is the beginner level. Students are required to demonstrate sufficient level of skills according to the grade level requirements in order to be awarded a certificate of attainment.

interest, and perceived values. Each scale was developed from several existing scales which had previously been used and validated. This is discussed in detail, with supporting references, in the following sections. However, as some of the items in the existing scales measure different aspects of motivation that are not the concern of this study, selection and modification of the items have been required in order to suit the operationalised definition for each of the scales used in this study. The following sections describe the development of these four scales.

Self-Concept Scale

The self-concept scale measures students' self-perception of their ability to learn music in general. Marsh's (1990b) Academic Self-Description Questionnaire (ASDQ), an instrument based on the Self-Description Questionnaire (SDQ) (Marsh, 1988, 1990a), has been adapted and modified to measure students' self-concept. The model used to develop the SDQ instrument is a revision of a model by Shavelson et al. (1976), which proposes academic self-concept as a single general construct. However, Marsh and Shavelson (1985) subsequently suggest that self-concept is multidimensional. Thus, the SDQ instrument is developed by them to test academic self-concept with more specific academic subjects, resulting in a better fitting model (Marsh & Shavelson, 1985). Subsequently, the ASDQ instrument is developed to measure self-concept according to a diverse range of academic subjects. As suggested by the author, Marsh (1990b), the ASDQ instrument is appropriate for researchers who are interested in studying academic specific self-concept, especially for subjects such as physical education, arts, and music. Hence, the ASDQ instrument is considered appropriate for this study.

There are two types of ASDQ instruments, ASDQ I and ASDQ II. ASDQ I measures Grade 5 to 6 students' self-concept while ASDQ II measures Grade 7 to 10 students' self-concept. ASDQ II was chosen as an instrument to be adapted in this study, because it measures higher grade students' self-concept, and is therefore more likely to suit the higher education context of this study. The ASDQ II instrument consists of 16 scales with 15 academic subject-specific self-concept scales and a general self-concept scale. The 15 academic subjects include English language, English literature, foreign languages, history, geography, commerce, computer studies, science, mathematics, physical education, health, music, art, industrial art, and religion. A six-point Likert-type response scale (false, mostly false, more false than true, more true than false, mostly true and true) is used for the ASDQ II instrument. The ASDQ II instrument has been validated and the results have indicated

good model fit (Marsh, 1990b). This also suggests that students are able to differentiate self-concept in different subject area (Marsh, 1990b). Thus, adapting the ASDQ II instrument is considered appropriate to measure students' self-concept in the music area for this study, specifically. In addition, this instrument has yielded high reliability coefficients ranging from 0.885 to 0.949 for the 16 scales.

As this study focuses on music, only items used to measure music self-concept from the ASDQ II instrument have been adapted. The ASDQ II instrument consists of eight items measuring music self-concept. However, only six items were adapted to measure music students' self-concept for this study. The reason for this was there were two similar items: "I have always done well in music classes" and "I get good marks in music classes". These two items have been combined into one item: "I usually get good marks in music". The other item, "it is important to me to do well in music classes", was not relevant to this study's operationalised definition of self-concept. This particular item describes how a student values music rather than how the student perceives his/her musical ability. The ASDQ II items have also been modified slightly to fit the higher education context of this study. For example, the ASDQ II item, "I am satisfied with how well I do in music classes", has been modified to "I am satisfied with how well I do in my music degree". A five-point Likert-type response scale is used to replace the original six-point response scale employed in the ADSQ II instrument to ensure that all the response scales used for the SMLIM instrument remain the same so as to reduce participants' confusion.

Self-Efficacy Scale

Self-efficacy is also referred to as students' self-perception of their ability (Bandura, 1977; Schunk & Pajares, 2010). However, self-efficacy places emphasis on students' self-perception of their ability relating to their music performing skills, specifically, while self-concept focuses on students' self-perception of their ability relating to music learning in general. For example, a self-concept item can be "I always do well in music" whereas a self-efficacy item can be "I always do well in music performance". Thus, there is a need to develop different scales to measure students' self-concept and self-efficacy, separately. The self-efficacy scale from Miksza's (2012) Self-Regulated Practice Behaviour Questionnaire (SRPBQ) has been adapted and modified to measure students' self-efficacy in this study. The SRPBQ instrument measures a range of self-regulation dimensions of beginning and intermediate instrumental music students. The SRPBQ instrument consists of five scales measuring different dimensions of self-regulation including motive, method, behaviour, time

management, and social influences. According to Miksza (2012), the motive dimension refers to "a student's self-beliefs and how they may or may not affect learning" (p. 321). He adapts C. P. Schmidt's (2007) self-efficacy scale (10 items) as the motive dimension. This particular self-efficacy scale from the SRPBQ instrument presented as suitable for this study because it measures music students' self-efficacy. Although other scales were also considered, such as the Self-Efficacy Writing scale developed by Pajares, Miller, and Johnson (1999), and the self-efficacy scale used in PISA 2006 study, they have been rejected for use in this study as they are not designed to measure students' self-efficacy in the music area.

In the item selection procedure, Miksza (2012) conducts exploratory inter-item and item-total analyses for the hypothesised self-efficacy scale. The statistical results suggested that removing one item from the self-efficacy dimension increases internal consistency (Miksza, 2012). The results also indicate that the self-efficacy scale yields a relatively high reliability coefficient of 0.83 (Miksza, 2012). Additionally, Miksza examines the construct validity of the SRPBQ instrument using confirmatory factor analysis (CFA). The final results confirm that self-efficacy is reflected by nine items in SRPBQ instrument. However, only six of the nine items from the SRPBQ instrument have been adapted for this study. Two of the items – "compared with others in the band, I think I am a good musician" and "compared with other band students, I expect to do well" – refer to self-concept instead of self-efficacy according to the operationalised definition used in this study. The third item omitted, "I expect to do well in music in the future", was deemed to be too similar to the other item, "I expect to be known as a good musician", as they both relate to students' expectation to succeed.

The other scales employed in the SRPBQ instrument (as mentioned above) have been adapted to develop the self-regulation measure in this study. This is described in further details in the Self-Regulation Instrument section (p. 54).

Personal Interest Scale

There are many published scales and instruments developed as a way of measuring personal interest. The existing scales and instruments taken into consideration include the interest scale from PISA 2006 and 2009's Student Questionnaires, and C. P. Schmidt's (2005) Motivation Survey Instrument (MSI). The PISA instruments have been chosen because they are well-established instruments developed by the Organisation for Economic Co-Operation

and Development (OECD) to conduct large-scale international research studies. The PISA instruments have been developed and validated by professionals in the measurement field. Thus, items from the PISA instruments are considered reliable, and suitable to be adapted for this study. Detailed information regarding the development and validation of the PISA instruments can be found in the PISA 2006 technical report (OECD, 2009) and PISA 2009 technical report (OECD, 2012b). However, the PISA instruments are designed to measure students' personal interest within the subject areas of science, mathematics, and reading. Therefore, the interest items from the PISA instrument have been modified to suit the music context of this study. For example, "I like talking about *books* with other people" has been modified to "I like talking about *music* with other people".

C. P. Schmidt (2005) MSI instrument was considered because this instrument measures different dimensions of students' motivation in the music area: mastery, intrinsic, individual, co-operative, competitive, ego, approach success, avoid failure, commitment to band, and self-concept. There are two items developed to measure each dimension. However, only the interest items are considered, due to the other items not addressing students' personal interest in music. The interest items are referred to as intrinsic in the MSI instrument. Only one out of the two items has been adapted for use in this study, because the other item referred to band music learning while this study focused on individual music learning. In addition, C. P. Schmidt (2005) reported high reliability coefficients for the motivation scales, ranging from 0.80 to 0.93. The intrinsic scale had a high factor loading of 0.82, as indicated in the CFA results (C. P. Schmidt, 2005).

Perceived Values Scale

The perceived values scale measures students' extrinsic motivation. The researcher had difficulty in finding a suitable instrument to measure students' extrinsic motivation in the music area. Thus, extrinsic motivation scales from PISA 2006's Student Questionnaire and R. Schmidt, Boraie, and Kassabgy's (1996) motivation questionnaire have been adapted. PISA 2006 and R. Schmidt et al.'s (1996) extrinsic motivation scales are designed to measure students' motivation to obtain an external reward in science and English language, respectively. As mentioned in the previous section, the PISA instrument is considered because it is a well-established instrument used in international large-scale research studies. Detailed information regarding the development and validation of the PISA instruments can be found in from PISA 2006 technical report (OECD, 2009).

Additionally, R. Schmidt et al.'s (1996) extrinsic motivation scale has been adapted for this study. This scale comes from Carreira's (2005) study, and consists of a total of 15 items. In the original study, the extrinsic motivation scale and other motivation scales are constructed based on existing questionnaires, concepts of motivation found in the literature, and discussions with teachers, administrators, and students. The internal consistency of each motivation scale is assessed by Cronbach's alpha coefficient. The extrinsic motivation scale yields relatively high internal consistency of 0.75. In addition, according to Carreira (2005), R. Schmidt et al.'s (1996) instrument has been employed as a basis to develop extrinsic motivation scales in numerous research studies (e.g. Carreira, 2004; Kimura, Nakata, & Okumura, 2001; Takagi, 2003). Thus, these two scales (PISA and R. Schmidt et al.'s extrinsic motivation scales) can readily be adapted for this study, with minor modification to suit the music context.

3.6.1.3 Parental Involvement Instrument

Parental involvement is another focus of this study. The parental involvement (PI) instrument measures the frequency of parents' participation in a range of activities related to students' music learning processes. In this study, parental involvement is measured in two forms: early parental involvement and current parental involvement. The following sections describe the development of these two scales in further details.

Early Parental Involvement Scale

The early parental involvement scale measures the frequency of parents' involvement in activities associated with students' music learning processes in the early stage. Zdzinski's (1992) Parental Involvement Measures (PIM) has been adapted to construct the early parental involvement scale. The PIM instrument is based on Brand's (1985) Home Musical Environment Scale (HOMES). The HOMES instrument consists of 15 items. Content validity of the HOMES instrument was assessed by a panel of music educators and the concurrent validity of the instrument was assessed by comparing the music teachers' and parents' evaluations of the home musical environment using the HOMES instrument (Brand, 1985). The HOMES instrument yielded a high reliability coefficient of 0.86. Similarly, the PIM instrument also yielded a high reliability coefficient of 0.85. In addition, the PIM instrument was subjected for test-retest reliability and yielded a high reliability coefficient of 0.94. However, the PIM instrument is preferred over the HOMES instrument, because the HOMES instrument is designed to collect information from parents (Brand, 1985) while the PIM instrument is designed to measure students' perceptions on the

frequency of their parents' involvement in their music learning activities (Zdzinski, 1992). In consideration of the feasibility of collecting information from the parents, the PIM instrument has been chosen instead of the HOMES instrument.

The PIM instrument consists of 15 items. However, only 12 items have been adapted and modified to measure parental involvement for this study. This is because the PIM instrument is a means of measuring parental involvement at the secondary level. Thus some of the items are not suitable for measuring parental involvement within the higher education context of this study.

Current Parental Involvement Scale

The current parental involvement scale measures the frequency of parental involvement in activities associated with students' current music learning process. For the current parental involvement scale, seven of the 12 items from the early parental involvement scale have been adapted, because the remaining five items are not relevant to the definition of this scale. For example, the item "sing with you" might not be an activity that university students usually do with their parents, especially for students who study away from home, where singing with their parents becomes not viable.

3.6.1.4 Self-Regulation Instrument

Students' self-regulation refers to music learning strategies, including cognitive strategies, metacognitive strategies, adaptive learning strategies, and resource management used by students to achieve the goals of learning. The self-regulation (SR) instrument to measure students' self-regulation is based on the model used by Miksza (2012), which derives from McPherson and Zimmerman's (2002) theoretical model of self-regulation. There are five dimensions of self-regulation as outlined in Miksza's (2012) study:

a) *Motive*. A student's self-beliefs and how they may or may not affect learning.
b) *Method*. Task-oriented learning strategies, mental strategies, and other general approaches to self-instruction.
c) *Behaviour*. Orientations toward reflective thinking, metacognition, and learners' abilities to self-evaluate or monitor their own learning processes.
d) *Time management*. Students' abilities to concentrate, focus on tasks, and plan the use of their time
e) *Social influences*. Learners' tendency to engage others through help-seeking behaviours. (pp. 322-323)

The five dimensions are used by Miksza (2012) to develop the Self-Regulated Practice Behaviour Questionnaire (SRPBQ). The SRPBQ instrument consists of 47 items measuring: motive (10 items), method (14 items), behaviour (7 items), time management (6 items), and social influences (10 items). However, as mentioned in the previous section (pp. 49-51), students' self-efficacy, which is incorporated as part of the motive dimension, has been excluded from the self-regulation measures because self-efficacy measures students' self-beliefs instead of their learning strategies. Thus, only four scales have been used to measure students' self-regulation in this study: method, behaviour, time management, and social influences.

In addition, the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich & DeGroot, 1990) and the Norwegian adaptation of the MSLQ instrument (MSLQ-inventory) (Nielsen, 2004) have also been considered in the development of the self-regulation measures. The MSLQ instrument yields relatively high reliability coefficients, ranging from 0.74 to 0.89. However, several studies, such as Austin and Berg (2006), Miksza (2006), and the MSLQ-inventory (Nielsen, 2004), which employ the MSLQ instrument to measure self-regulation within the music-specific context, report middle range reliability coefficients from 0.60 to 0.70 (Miksza, 2012). As the reliability coefficients are within the acceptable range, the MSLQ instrument and the MSLQ-inventory are taken into consideration for this study, because the MSLQ instrument wisas widely used for self-regulation studies (e.g., Credé & Phillips, 2011; Duncan & McKeachie, 2005; Dunn, Lo, Mulvenon, & Sutcliffe, 2012; Rotgans & Schmidt, 2010). In addition, the MSLQ-inventory has been developed specifically to measure students' self-regulation in the higher education sector, a setting similar to that of this study. However, as the full MSLQ-inventory is not freely available for non-commercial university research, only items that were published have been adapted for this study.

Despite the inclusion of items from the MSLQ instrument and the MSLQ-inventory, items from the SRPBQ instrument contribute primarily to the development of the self-regulation scale for this study. The SRPBQ instrument was designed to measure middle school band students' self-regulation, according to the framework cited above. The SRPBQ instrument yields high reliability coefficients for the scales associated with the hypothesised self-regulation dimensions, ranging from 0.76 to 0.85. The test-retest reliability also yields high reliability coefficients, ranging from 0.75 to 0.91. Miksza (2012) also conducts CFA to examine the construct validity of the SRPBQ instrument. The statistical results indicate good

model fit for the self-regulation model (Miksza, 2012). Thus, the SRPBQ is considered suitable for developing the self-regulation measures. Miksza also has given permission and has provided a copy of the SRPBQ instrument to the researcher. However, minor modification of the wordings have proven necessary, as the SRPBQ instrument measures middle school band students' self-regulation while this study focuses on measuring university music students' self-regulation. Items from the SRPBQ instruments have also been adapted selectively to fit the context of this study.

3.6.2 Music Performance Rating Scale

A music performance rating scale (MPRS) has been developed to measure students' music performance achievement level. It was necessary to develop the MPRS instrument, instead of collecting existing achievement results, to ensure comparable results by using the same rating criteria to assess students' music performance across the participating universities. The items employed in the MPRS instrument have been adapted from S. Thompson and Williamon's (2003) assessment form, which they use in their research study to examine inter-rater agreement and utility of the measurement system in music performance at the Royal College of Music (RCM) in London. Their assessment form consists of 14 categories: a category of overall rating of the performance quality; three overall ratings of the main categories (perceived instrumental competence, musicality, and communication), taken from the guidelines of the Associated Board of the Royal Schools of Music; and a total of ten subcategories under each main category defined through consultation with the instrumental professors at the RCM. According to S. Thompson and Williamon (2003):

> The scheme of the Associated Board of the Royal Schools of Music was chosen as the basis because of its ubiquity within the U.K. music education system and the fact that, more than most comparable systems, it has been in constant use and development for many years. (p. 29)

In addition, S. Thompson and Williamon's (2003) assessment form is chosen to be adapted for this study because their instrument is designed to assess performances of different musical instruments compared to the purpose of other existing instruments (e.g., Parkes, 2010; Wrigley & Emmerson, 2013; Zdzinski & Barnes, 2002), which assess performance of specific musical instruments.

In terms of the utility of the measurement system, the results exhibit a narrow range of discrimination between categories. S. Thompson and Williamon (2003) explain that the

examiners may have arrived at a holistic mark first, and then assigned the same mark for all categories. If this is the case, the reason for this may be the lack of specific guidelines for completing the form resulting in the examiners adopting the above strategy. Thus, the overall rating categories have been omitted in the MPRS instrument and descriptions added to explain each category to reduce the possibility of the situation above occurring. The original ten-point rating scale, designed to rate student's music performance, has been adopted in the MPRS instrument. According to S. Thompson and Williamon (2003), the ten-point rating scale is chosen because it maps more directly onto the 100-point scale commonly used in the educational context, and with which examiners are familiar. The ten-point rating scale used in the MPRS instrument has been modified with descriptions added to assist the examiners to interpret consistently the proficiency level of students' music performance.

3.6.3 Semi-Structured Interview Guide

The qualitative component of the study aims to develop a further and in-depth understanding of the factors that students perceive as impacting on their motivation to learn instrumental music. In contrast to the quantitative component of the study that tests models and provides information at a macro level, the qualitative component has the advantage of capturing an integrated picture of the phenomena under study at a micro level. Interviewing was chosen as the method because this approach provides opportunities for the students to speak to the researcher about their experiences and views (Cohen et al., 2007; Flick, 2014). There are several types of interview: focus group, structured interview, and semi-structured interview. The semi-structured interview was selected on the basis that it consists of a set of prepared questions which guide the interview, and, at the same time, it has the flexibility to ask additional questions to explore and make the interviewee's perspective more explicit (Denscombe, 2010; Flick, 2014).

A total of five open-ended and theory-driven questions were prepared as the basic interview format. The interviews start with a question that encourages students to speak about their music learning experiences. This particular question aims at gaining an in-depth understanding of interviewees' music learning processes. In addition, theory driven questions were devised based on the hypothesised model employed in the quantitative study to guide the direction of the interview. This is to ensure interview data which is theoretically relevant to the purpose of the study. Probes such as "how do you feel…" and "why…" are used to encourage participants to elaborate their thoughts. Basic information relating to the interview (i.e., interview date, interview venue, interview time, and interviewee

demographic information) has been recorded, and a checklist has been used to ensure the systematic carrying out of each interview.

3.7 Pilot Study

Pilot studies have important functions in the research process. According to van Teijlingen and Hundley (2001), pilot studies are used in social science research: (i) as feasibility studies that are a small-scale version or trial run done in preparation for the main study, or, (ii) to pre-test or try out a particular research instrument. The primary aim of this pilot study was to test the adequacies of the research instruments developed for this study, as well as to test the validity of the instruments before using them in the main study. Further details about the pilot study are explained in the following sections.

3.7.1 Student Survey Questionnaire

The student survey questionnaire consists of three instruments and ten scales to measure students' motivation towards learning instrumental music (SMLIM instrument, 4 scales); students' perceptions of the frequency of parental involvement associated with their music learning processes (PI instrument, 2 scales); and their self-regulation (SR instrument, 4 scales). Table 3.1 provides details of the scales included in each of the instruments.

Table 3.1. Scales included in SMLIM, PI, and SR instruments.

Instrument	Scale
SMLIM	Self-concept
	Self-efficacy
	Personal interest
	Perceived values
PI	Early parental involvement
	Current parental involvement
SR	Method
	Behaviour
	Time management
	Help-seeking

Each scale used in this study is based on existing scales. Thus, items that came with the existing scales have been adapted with care, taking into consideration their suitability in the context of music in the Malaysian higher education context. The purpose of conducting the

pilot study was to test the usability of these ten scales in the student survey questionnaire, and also to have an initial view of their validity in the context of the present study.

The survey questionnaire was subjected to face validation before proceeding to collect data from the students. Experts from among the researcher's faculty members were invited to review the adequacy of the instrument, including word usage and presentation of the items. The survey questionnaire was also face validated by Malaysian university students to check the comprehensibility of the English language usage within the Malaysian context. Minor modifications of the items and the presentation of the survey instrument were undertaken according to the recommendations provided by the experts and Malaysian university students

The pilot study participants were drawn from a private music school and a private music teaching studio in Malaysia. Students from universities in Malaysia were not invited to participate in the pilot study to preserve them as potential participants for the main study. This was because only ten universities offer music degrees in Malaysia and a large enough sample size was required to enable quantitative data analysis in this study. The private music school and the private teaching studio were chosen for convenience, because the researcher had contact with them. The sample for the pilot study was made up of students who were going to undertake Grade six and above music practical examinations from external organisations (i.e., Trinity College London and Associated Board of the Royal Schools of Music). These selection criteria were decided so as the sample used in the pilot study was as similar as possible to the sample selection criteria (i.e., music degree level) in the main study.

Initial permission was sought from the principal of the private music school and the teacher in charge of the private teaching studio before conducting the pilot study. A total of 45 students who met the pre-defined criteria participated in the pilot study. As the students were taught on a one-to-one basis, it was impractical for the researcher to collect data in person. Thus, the administration officer of the private music school and the teacher in charge of the private teaching studio facilitated the distribution of the questionnaire. The researcher later collected the completed questionnaires. Before distributing the survey questionnaire, the participants were given an information sheet consisting of details about the study and their consent. This was to ensure that the pilot study was in compliance with ethical conduct.

After the completed questionnaires were collected, the items used in the questionnaire were subjected to preliminary CFA and item analysis to examine the construct validity of the survey instrument. The pilot data were entered into a Microsoft Excel spreadsheet and later transferred into other software packages for the purpose of analysis. IBM Statistical Package for the Social Sciences (SPSS) version 21.0 and ConQuest 2.0 software were used to conduct CFA and item analysis, respectively. The analyses were carried out to check the preliminary structure of the scales for each instrument and the functions of the items in the survey questionnaire, because the instruments were developed based on different existing scales and instruments. SPSS software was also used to analyse and determine reliability based on Cronbach's alpha coefficients for each scale in the instrument.

3.7.2 Music Performance Rating Scale

The pilot study was carried out to determine the adequacy of the MPRS instrument. The MPRS instrument consists of ten items designed to measure different aspects of music performance. Face validation was conducted initially to check the word usage and presentation of the MPRS instrument. Teachers from the private music school and private teaching studio were invited to use the MPRS instrument to rate music performances of students who participated in the survey pilot study. In order to increase the consistency of the rating process, music performances being rated were musical pieces which students prepared for their examination. The rating process occurred during students' one-to-one lesson time so that arrangement of another pilot study session is not required, to minimise extra workload for the teachers and students. Participants' consent was obtained prior to distribution of the MPRS form to ensure that the pilot study was conducted ethically. An information sheet was distributed to the participants before conducting the pilot study. The information sheet indicated that students' consents were given at the time they completed and returned the MPRS form.

Completed MPRS forms were collected by the researcher and subjected to preliminary CFA and item analysis to examine the construct validity of the MPRS instrument. Similar to the survey pilot study, the pilot data were entered into a Microsoft Excel spreadsheet and later transferred into other software packages for the purpose of analysis. IBM SPSS version 21.0 and ConQuest 2.0 software were used to conduct CFA and item analysis, respectively. SPSS software was also used to facilitate reliability analysis of the MPRS scale.

3.7.3 Semi-Structured Interview Guide

Experts from amongst the researcher's faculty were invited to review the adequacy and suitability of the interview questions. These experts have extensive experience in conducting qualitative studies. Several modifications were made in response to the feedback received, particularly so as to structure the questions in a semi-formal style to create a more relaxed interview session.

3.8 Finalisation of the Instruments

3.8.1 Student Survey Questionnaire

The survey instrument used in this study was named "Music Student Survey Questionnaire: Malaysian Higher Education (2014)". A total of 99 items constitute the four sections of the survey instrument:

a) Demographic information
b) Home music learning environment
c) Student attitudes towards music
d) Self-regulation.

Results from CFA conducted using SPSS software suggested that there were three misfitting items that may not have been useful and/or meaningful for the survey instrument. In addition, results from item analysis conducted using ConQuest indicated that there were seven misfitting items that may not be useful and/or meaningful were they to be included in the survey instrument. However, it was considered possible that these items may have not been able to discriminate appropriately due to the small sample size used in the pilot study. Reliability analysis results (Cronbach alpha using SPSS) mostly showed acceptable values, ranging from 0.61 to 0.83. The alpha value below the acceptable range of 0.70 could be affected by factors such as length of the questionnaire, time limit given to the participants, and group heterogeneity (Alagumalai & Curtis, 2005). Nevertheless, since the reliability values were mostly within the acceptable range, and an overall adequacy of the instrument was obtained, all the items were retained for the final survey instrument.

3.8.2 Music Performance Rating Scale

The MPRS instrument used in this study is named "Music Performance Assessment Report". There were initially ten items developed for the MPRS instrument. However, in the final instrument, as a result of a follow-up discussion with the experts, only nine items

assessing three aspects of students' music performance, including instrumental competence, musicality, and communication are retained. The particular item that was removed was constructed to measure students' stress levels on the stage during performance, which may have been impractical through mere observation.

The CFA results indicated that students' music performance achievement level was reflected by the nine items. In contrast, item analysis results suggested that there were two misfitting items that may not be useful and/or meaningful were they to be included in the MPRS instrument. As the reliability analysis results exhibited high reliability of 0.97, it was decided to keep the nine items in the MPRS instrument.

3.9 Data Preparation

Several software programs were used to prepare and process the data collected. Raw numerical data collected from the student survey questionnaire and music performance rating scale were entered into Microsoft Excel software. Microsoft Excel was chosen because this software program is readily available, and enables the transformation of data to formats compatible with other software programs for specific data analyses. Each item entered into the Microsoft Excel software was assigned a code. The raw data in the Microsoft Excel spreadsheet format were then converted into SPSS file format for data processing. In cases where nominal and ordinal data existed, the data were then assigned numbers (e.g., gender: 0 for male, 1 for female; performing experience: 1 for none, 2 for less than once a year, 3 for once a year, 4 for more than once a year) using SPSS software. Missing data were coded as number '-99' or left blank for software programs which recognised blank space as missing value by default. Items in the instrument that required reverse scoring were recoded and saved in a different file with the addition of a suffix 'recode'. SPSS software was also used to obtain basic descriptive statistics and to assist in identifying and removing typographical errors. A codebook was created to record all the coding used for the quantitative instruments in this study (Appendices I, and J, pp. 231-243).

For qualitative data, student interviews were transcribed word-for-word and translated by the researcher (where necessary) into text form using Microsoft Word software. The interview data was processed to de-identify the participants by replacing their names with alphabetical codes to reserve their anonymity. The de-identified data were then converted into a format compatible with NVivo software for data analysis.

3.10 Validity and Reliability of the Instruments and Data

3.10.1 Validity and Reliability of the Quantitative Instruments

A valid and reliable instrument is especially important in quantitative research to produce valid and reliable measures for making useful and meaningful inferences and informed decisions. It is crucial to always ensure that the instrument is used within the context as intended. According to Chan (2014):

> *Validity* refers to the quality of the inferences, claims, or decisions drawn from the scores of an instrument and *validation* is the process in which we gather and evaluate the evidence to support the appropriateness, meaningfulness, and usefulness of the decisions and inferences. (p. 9)

In the other words, validity ensures that the instrument developed is measuring what it purports to measure. The instruments employed in this study have been adapted and modified from previous instruments that were used in different context. Thus, it is crucial to carry out validation procedures to examine that the instrument is used within the context as intended for this study. Among all the existing validation practices, construct validity remains the central component of validation work to evaluate the psychometric properties of an instrument (Zumbo & Chan, 2014). In the contemporary view of validity, construct validity is related to evidence of validity based on internal structure that determines the extent to which the observed scores collected using the instrument are related to the expected or hypothesised theoretical model (Creswell, 2012). This form of validity is examined by conducting statistical procedures such as factor analysis and item response modelling. Both statistical methods have been adopted in this study to check the construct validity of the quantitative measurement instruments, namely the student survey questionnaire and music performance rating scale.

Specifically, validation of the instruments used in this study is conducted using CFA and Rasch modelling. The CFA method seeks to confirm that the hypothesised relationship between the observed variables and underlying latent constructs is consistent with the empirical data (Diamantopoulos & Siguaw, 2000). CFA is commonly adopted when there is an explicit prior hypothesised factor structure or model specification (MacCallum, 2009). As the scales have been developed based on existing literatures and instruments, CFA is considered an appropriate statistical technique to examine the factor structure of the scales for this study. Item analysis using Rasch modelling is conducted in addition to CFA to test for unidimensionality of the scales. In contrast to the CFA method, which examines the factor structure of the scales, Rasch item analysis examines the conformity of the responses

obtained from items to the requirements of measurement model. This is the unique feature of Rasch modelling, which focuses on inspecting whether each item contributes in a meaningful way to the measurement of a single underlying construct/concept (Bond & Fox, 2015). Since prior test of dimensionality is required before assessing unidimensionality using Rasch modelling, validation approaches using both CFA and Rasch item analysis are complementary of each other (Tennant & Pallant, 2006). The use of both approaches for validation is also advocated by Hailaya, Alagumalai, and Ben (2014), and R. B. Kline (2016). Further information regarding the validation approaches employed in this study can be found in Chapter 4.

Reliability is a necessary, though not sufficient, condition for validity (Kane, 2013; B. Thompson, 2004). In general terms, reliability refers to the measurement of consistency (Creswell, 2012). Scores from an instrument need to be stable and consistent before they can be interpreted meaningfully (i.e., valid inferences) (Creswell, 2012). The existence of both reliable and valid scores is the key to making informed and sound inferences. In this study, the internal consistency of the scores obtained from the instrument has been tested using coefficient alpha (Cronbach, 1984).

3.10.2 Quality of the Interview Data

In terms of qualitative research, validity and reliability are associated with the accuracy and trustworthiness of the data and research findings, through strategies such as member checking and triangulation (Creswell, 2012). Guba (1981), as one of the pioneers in establishing a framework for assessing trustworthiness in qualitative inquiry, proposes four criteria to be considered: credibility, transferability, dependability, and confirmability. Further information regarding these four criteria is presented in Chapter 4. This study employs the method of member checking to confirm the data and findings. Some of the interview transcriptions undertaken for this study required translation, and confirming the accuracy of the translated data and findings is especially important to ensuring a trustworthy study.

3.11 Data Analysis

After the collected data had been processed using Microsoft Excel, Microsoft Word, and SPSS software, analysis of the data proceeded. The analysis began with quantitative data analysis employing SPSS, LISREL, and ConQuest software. There were several procedures

involved, including validation of the research instruments, transformation of the raw scores into measures, and carrying out multiple regression analysis and path analysis. Quantitative data analysis was followed by qualitative data analysis employing NVivo software to organise the interview data, which enabled the researcher to carry out thematic analysis.

3.11.1 Quantitative Data Analysis

Multiple regression analysis and path analysis are employed in this study to enable the researcher to examine the relationships among students' motivation towards learning instrumental music, home musical learning environment, self-regulation, and music performance achievement. Both multiple regression analysis and path analysis are statistical methods used to explain or predict a dependent variable (outcome) using one or more independent variables (predictor) (Schumacker & Lomax, 2016; Sullivan, 2009). Thus, these statistical analysis techniques are considered appropriate within the context of this study to investigate the relationships between the above mentioned factors. Further details about these statistical analysis techniques are described and discussed in Chapter 6.

3.11.2 Qualitative Data Analysis

As the qualitative study serves as a supporting component of this study, thematic analysis is considered useful for integrating and comparing qualitative and quantitative findings. Thematic analysis is a strategy commonly used to identify patterns of meaning within the textual data (Braun & Clarke, 2006). This analytic strategy extends beyond counting the word and code frequencies to capturing the complexities of the meaning within the data, such as interpreting the relationships between the themes identified (Guest, MacQueen, & Namey, 2012). Further details about thematic analysis are provided in Chapter 6.

3.12 Summary

A mixed methods approach has been chosen for this study as the combination of quantitative and qualitative research methods are complementary to each other. This approach enables the researcher to answer the research questions from a macro-perspective level using quantitative method, and further explore the study topic from a micro-perspective level using qualitative method. A series of systematic procedures carried out to collect and analyse data based on the mixed methods design is discussed in this chapter; these include research instrument development, pilot study, methodological considerations to ensure

quality of the study, and data analytic techniques employed. Additionally, ethics clearance and sample selection procedures have been described. Considerations taken for all these aspects are particularly important to ensure the rigour of the study, so as to yield meaningful inferences and interpretations concerning the factors that impact on measured achievement of students' music performance in Malaysia. Comprehensive descriptions of the procedures employed to examine the quality of the study and to analyse the data are outlined in Chapter 4 and 6 respectively. The analyses of the results are presented in Chapter 5 and 7.

Chapter 4:
Methodological Considerations

4.1 Introduction

Research instruments play an important role in this study, as they underpin the empirical investigation of the associations between students' motivation, home learning environment, self-regulation, and measured achievement of their music performance. This mixed methods study employs a student survey questionnaire and music performance rating scales to collect quantitative data, and semi-structured interviews to collect qualitative data. As the quality of the data collected using these instruments is crucial to the capacity to make credible and meaningful inferences from the study's findings, ensuring the validity and reliability (also known as trustworthiness within the qualitative context) of the data collected employing these instruments is fundamental.

As suggested by O'Cathain (2010), there are three types of approach that can be used to assess the quality of mixed methods study: the generic research approach, the individual components approach, and the mixed methods approach. Each of these has its strengths and limitations. The individual components approach assesses the quality of the quantitative and qualitative components separately (O'Cathain, 2010). Creswell and Plano Clark (2011) have raised the concern that this method may overlook the fact that inferences are made from both components, rather than individual components. However, the individual components approach is employed as the techniques used to assess the quality of quantitative and qualitative components are different in nature. In addition, the data can only be integrated for analysis and inference-making if each of the qualitative and quantitative components is valid, reliable, and trustworthy. Regardless of the approach taken, the core concept is to address the quality of the study by ensuring the rigour of the research process, accuracy of the data collected, application of sound analytic methods, and drawing of meaningful inferences which inform decision-making. This chapter begins with a description of the concept of measurement in the context of quantitative study. The measurement models and procedures employed to examine the validity and reliability of the quantitative data are also outlined. This is followed by a description of the concept of trustworthiness and the strategies employed to maintain the quality of the qualitative data. A summary is provided at the end of this chapter.

4.2 What is Measurement?

Measurement "involves the processes of description and quantification" (Alagumalai & Curtis, 2005, p. 1). In most cases, measurement is defined as "the assignment of numbers to categories of observations" (Wilson, 2005, p. 4). The measurement applications in the educational and psychological context are associated with measuring attributes of educational interest using four common types of scale – nominal, ordinal, interval, and ratio – proposed by Stevens (1946). The nominal scale is used when the objects of measurement can be placed into (unordered) categories (i.e., male, female); the ordinal scale is used when the objects of measurement can be placed into ordered categories (i.e., low, medium, high); an interval scale is used when the objects of measurement can be labelled with numbers that can be added and subtracted (i.e., strongly disagree, agree, strongly agree); and a ratio scale is used when the objects of measurement can be labelled with numbers that can be used as divisors (possesses a meaningful zero value/absolute zero, i.e., height, weight) (Stevens, 1946, cited in Wilson, 2005).

In this study, the particular constructs of interest (i.e., students' attributes) are measured using scales proposed by Stevens that consisted of categories labelled with numbers (i.e., Likert-type scale: 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree). The participants' responses provide information in the form of a raw score. However, raw scores cannot be treated as measures; they are only indications of possible measures (Wright & Mok, 2004). Wright and Mok (2004) state that:

> Raw counts cannot be the measures sought because in their raw state, they have little inferential value. To develop metric meaning, the counts must be incorporated into a stochastic process which constructs inferential stability. Suppose we want to measure how long we can support a heavy pile of books. We may take a stop-watch to record the length of time, but the seconds counted do not 'measure' our experience. (p. 2)

In an educational setting, the performance of a person is commonly expressed as a total raw score, summing up the correct or incorrect responses from the test items (Bond & Fox, 2015). Thus, it is imperative that raw scores are converted to 'measures' to serve as a means to ascertain the measuring properties of a particular scale (Wilson, 2005).

To ensure that a measurement scale is sufficient to make useful and meaningful inferences, a series of rigorous statistical procedures is carried out to confirm that the measurement scale satisfies the properties of measurement requirements. Validity and reliability are the two major attributes of a measuring instrument used to produce useful and

meaningful inferences. The following sections discuss in more detail the concepts of validity and reliability.

4.3 Importance of Validity and Reliability

Validity and reliability are important concepts, especially in quantitative studies. Validity generally refers to "the extent to which a test measures what it was designed to measure" (Gipps, 1994, cited in Brady & Kennedy, 2009, p. 33). The general concept of reliability is the measure of consistency and stability (Brady & Kennedy, 2009; Creswell, 2012). Validity and reliability are complementary of each other. As indicated by Creswell (2012), "if scores are not reliable, they are not valid; scores need to be stable and consistent first before they can be meaningful" (p. 159). In this study, the measurement scales employed in the student survey questionnaire and music performance rating scale are examined for their validity and reliability.

4.3.1 Validity

The importance of validity has always been emphasised in the educational and psychological assessment system (AERA, APA, & NCME, 1999; Creswell, 2012) The seminal work on the unitary view of validity published by Messick (1989, 1990) became influential in the field of measurement and is reflected in the *Test Standards* (AERA, APA, & NCME, 1985; AERA et al., 1999) (Zumbo & Chan, 2014). According to Messick (1990), validity is "an integrated evaluative judgement of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of interpretations and actions based on test scores or other modes of assessment" (p. 5). He suggests that the two key components of validity are: (a) the meaningfulness of the measures obtained from the measurement process, and (b) the usefulness of the measures in research and/or practice (Keeves & Masters, 1999). Under the unified view of validity, the traditional forms of evidence of validation, such as content validity, concurrent validity, consequential validity, predictive validity, and construct validity should merge into considerations of validation practices.

Chan (2014) provides further contemporary conceptualisation of validity, stating that it is "about the inferences, claims, or decisions that we make based on instrument scores, not the instrument itself" (p. 10). Therefore, validation is an ongoing process through which to accumulate various sources of evidence of validation to support the interpretation and use of

the instruments (Zumbo & Chan, 2014). In other words, validation should be carried out whenever an instrument is used in a different context (e.g., such as in a different cultural background, a different cohort, and timelines) to ensure compatibility of the instrument and validity of the inferences made. The instrument employed in this study has been developed on the basis of various existing instruments. This instrument was adapted for Malaysian Music Education settings, which differ from the settings in which it was originally used. Thus, validation of the instrument becomes vital. The standards and guidelines of the contemporary conceptualisation of validity can be found in Chan's (2014, p. 10) work.

Cronbach and Meehl (1955), and Messick (1989), suggest that construct validity is of central importance, however, other evidence of validation is also important to ensuring the quality and utility of the instruments (Linn, 2010). This study establishes four types of validity: face validity, content validity, criterion validity, and construct validity. A graphical representation with descriptions of the types of validity being examined is shown in Figure 4.4 (p. 85).

4.3.2 Reliability

Reliability is a necessary, although not sufficient, condition for validity (Kane, 2013). Reliability refers to "the degree to which test scores are free from errors of measurement" and is broadly defined in terms of "consistency and generalizability" (Miller, 2010, p. 27). Almost all test score interpretations depend on generalisation over certain conditions of observations, such as consistency of the observers' ratings and the location/time at which a test takes place. These conditions can lead to an increase in measurement errors, and, thus, underpin the need to establish reliability as a necessary condition for validity (Kane, 2013). In addition, Messick (1990) states that "the principles of validity apply not just to interpretive and action inferences derived from test scores as ordinarily conceived, but also to inferences based on any means of observing or documenting consistent behaviours or attributes" (p. 5). This statement also confirms the importance of both validity and reliability co-existing in an assessment situation.

Using different statistical analysis techniques, there are various indicators of test or survey scale reliability. These techniques have been generally grouped under two testing and statistical modelling theories. These are the Classical Test Theory (CTT) and Item Response Theory (IRT). In CTT, different reliability indices can be computed depending on the concerns of the study. A summary of the reliability tests associated with the measurement

errors to be examined, based on the purpose of a particular test, can be found in Creswell's (2012) publication: *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. This current study reports the internal consistency of the instruments, which is the commonly conducted reliability test. Internal consistency is used to examine whether individuals' responses are consistent across items within a single test form (Creswell, 2012). For estimates of internal consistency, Cronbach's alpha coefficient of 0.70 and above are used in this study as the minimum cut-off point to indicate consistent responses across the items on the instruments (Nunnally & Bernstein, 1994, cited in Schumacker, 2010b).

The reliability indices in terms of standard errors computed based on CTT, however, have several shortcomings. The shortcomings are addressed using IRT, and are elaborated in the following section. Apart from that, the reliability estimates could also be affected by extraneous factors, such as measurement precision, group heterogeneity, and test administration settings (Alagumalai & Curtis, 2005; Brady & Kennedy, 2009). These factors are also taken into account in the design and use of instruments in this study.

4.4 Validation Procedures

Performing appropriate statistical procedures is necessary as part of the instrument scale validation process. This study employs the confirmatory factor analysis (CFA) model and the Rasch model to validate instruments. The measurement models help in understanding and evaluating the raw scores and guides the use of the scores in practical applications (Wilson, 2005). CFA is considered a 'macro-level' analytic method, as it is widely used to examine whether the structure obtained from a set of observed measures is consistent with the a priori factor structure of the scale. Rasch analysis, however, is considered to be a 'micro-level' analytic method, as it emphasises unidimensionality, which requires that each item measure only a single construct at a time (Hailaya et al., 2014). The research conducted by Hailaya et al. (2014) utilises both CFA and Rasch models, and the researchers highlight Wright's (1996) statement that the use of both models are complementary validation techniques. The following sections describe these models in further details.

4.4.1 Confirmatory Factor Analysis

Factor analysis is a type of Structural Equation Modelling (SEM) used to test the relationship between observed variables (manifest variables or indicators) and latent variables (constructs or factors). To be more specific, factor analysis is carried out as a statistical procedure that "attempt[s] to determine which sets of observed variables share common variance-covariance characteristics that define theoretical constructs or factors (latent variables)" (Schumacker & Lomax, 2016, pp. 87-88). There are two major types of factor analytic models: Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). In EFA, the researcher seeks to explore the number and nature of underlying factor structures of a set of observed measures (MacCallum, 2009). In CFA, the researcher has specific expectations regarding: (a) the number of factors, (b) which [observed] variables reflect given factors, and (c) whether the factors are correlated (B. Thompson, 2004, p. 6). Therefore, CFA is useful when there is prior theoretical knowledge of the factor model, as is the case of this study. CFA is used to test whether the observed measures confirm the pre-specified or hypothesised factor model. The present study aimed to examine the factor structures of the constructs, including students' motivation, parental involvement, self-regulation, and music performance achievement.

There are five steps involved in the process of examining the factor structures of instruments using CFA: model specification, model identification, model estimation, model testing, and model modification (Schumacker & Lomax, 2016).

The first step is model specification, which involves specifying the hypothesised factor model, represented either in graphical or equation form. The graphical factor model (as shown in Figure 4.1) consists of latent variable (LV), observed variable (OV) and measurement error (e). A latent variable is represented by an oval; observed variables are represented by rectangles; and the measurement error by a small circle. The arrow directed from the latent variable to an observed variable denotes the relationship between the factor and the observed measure. The graphical display shows that LV represents the common variation among OV1, OV2, and OV3. The measurement error indicates that part of each observed variable is measuring something different from the hypothesised factor that has not been explicitly modelled (Schumacker & Lomax, 2016).

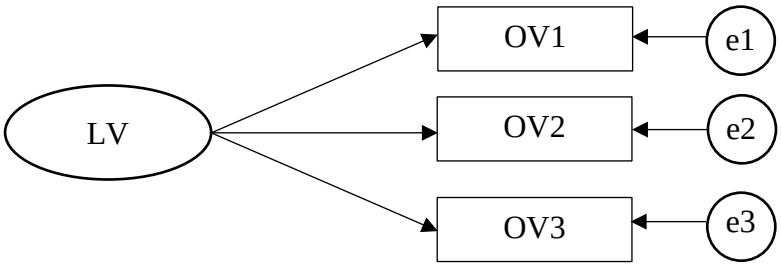


Figure 4.1. Example of a factor model.

These relationships can also be expressed as the following equation:

$$OV1 = LV + e1$$
$$OV2 = LV + e2$$
$$OV3 = LV + e3$$

The second step is model identification, which aims to determine whether there is a unique set of parameter estimates that can be found between the observed data and the specified factor model to satisfy the identification conditions for subsequent model estimation in the third step (Schumacker & Lomax, 2016).

In the model estimation process (third step), statistical results are produced to depict the relationship between the factor and the observed measure (factor loadings) and to inform the fit of the observed data to the factor model.

The fourth step is model testing that involves analysing and interpreting the factor loadings and model fit. Factor loadings indicate how well the observed measures reflect their respective construct. There is a range of model fit indices that are used to investigate whether the observed data are consistent with the measurement model.

When the model fit is acceptable, the specified factor model is confirmed. Otherwise, the fifth step, model modification, is carried out to improve the factor model when model fit is poor.

CFA tests were carried out using specialised statistical software, LISREL 8.80 (Jöreskog & Sörbom, 2006). LISREL is a SEM statistical software that is effective for CFA tests. This

software is also introduced in many books in relation to running CFA tests (e.g., Cramer, 2003; Diamantopoulos & Siguaw, 2000; Schumacker & Lomax, 2016; B. Thompson, 2004). Additionally, LISREL was chosen because this software was made available for the researcher's use. All the measurement scales were subjected to one-factor CFA:

a) Survey questionnaire
    - Student motivation towards learning instrumental music (SMLIM) instrument
        - Self-concept scale (6 items)
        - Self-efficacy scale (6 items)
        - Personal interest scale (6 items)
        - Perceived value scale (6 items)
    - Parental involvement (PI) instrument
        - Early parental involvement scale (12 items)
        - Current parental involvement scale (7 items)
    - Self-regulation (SR) instrument
        - Method scale (13 items)
        - Behaviour scale (5 items)
        - Time management scale (5 items)
        - Help-seeking scale (6 items)
b) Music performance rating scale (MPRS).

One-factor model is a measurement model whereby all items reflect a single factor. (Cramer, 2003). As shown in the example below (Figure 4.2), all self-concept items (SelCon1, SelCon2, SelCon3, SelCon4, SelCon5, and SelCon6) are loaded on their respective factor – self-concept – only. This particular model has been chosen to lessen the complexity of subsequent analysis of unidimensionality. In general terms, unidimensionality suggests that all of the observed variables reflect a single latent variable. However, it is recommended that further investigation be conducted into the structure of these scales using other models, such as the multi-factor model and the hierarchical factor model.

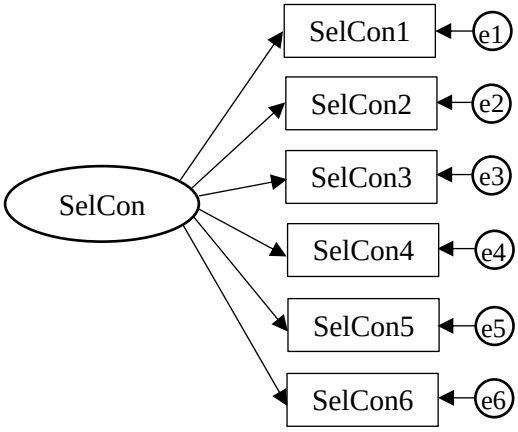


Figure 4.2. Example of one-factor model.

The CFA results provide information regarding the hypothesised measurement model, including factor loadings and model fit indices. Factor loadings are statistical results that delineate the relationship between the factor and the observed variable. The square of a standardised factor loading indicates how much variation in an observed variable is explained by the factor (Hair, Black, Babin, & Anderson, 2010). Hair et al. (2010) suggest the use of guidelines (as shown in Table 4.1) to interpret the value of the factor loadings.

Table 4.1. Guidelines for interpretation of the value of the factor loadings.

Factor Loadings	Guidelines
±0.30 - ±0.40	Minimal level acceptable for meaningful interpretation of the factor
±0.50 - ±0.60	The observed variable is moderately significant in interpreting the factor
≥ ±0.70	The observed variable is highly indicative of the factor

Note. Original source from Hair et al. (2010).

It is also important to evaluate the statistical significance of the factor loadings according to sample size. The guidelines proposed by Hair et al. (2010) are presented in Table 4.2.

Table 4.2. Guidelines for identifying significant factor loadings based on sample size.

Factor Loadings	Sample Size Needed for Significance
0.30	350
0.35	250
0.40	200
0.45	150
0.50	120
0.55	100
0.60	85
0.65	70
0.70	60
0.75	50

Note. Original source from Hair et al. (2010).

Consistent with the guidelines provided by Hair et al., this study employs a minimum factor loading of ±0.30 as the cut-off value. The observed variables with factor loadings that are ±0.30 and greater suggest significant and meaningful indicators of their respective factor. This is because the sample size of this study is 375 where ±0.30 is the minimum requirement to exhibit statistical significance. In addition, ±0.30 is the minimum value for meaningful interpretation of the factor.

Apart from factor loadings, CFA results also include model fit indices. There is a collection of fit indices available to assess different aspects of model fit. Three major categories of widely used fit indices are absolute fit indices, incremental fit indices, and parsimony fit indices. Absolute fit indices provide the fundamental indication of how well the hypothesised model fits the observed data; incremental fit indices assess model fit by comparing the hypothesised model to a baseline model; and parsimony fit indices provide information about the complexity of the model based on absolute fit indices, by adjusting loss of degrees of freedom (Hooper, Coughlan, & Mullen, 2008; Schumacker & Lomax, 2016). Each index has its own usefulness and/or limitations. It is strongly suggested to report a variety of fit indices to reflect different aspects of model fit, but also based on the modelling purpose of this study. The model fit indices reported for all the CFA tests in Chapter 5 are absolute fit indices, including chi-square (X^2), root mean square error of approximation (RMSEA), root mean square residual (RMR), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), and parsimony fit indices, including parsimony goodness-of-fit index (PGFI). Incremental fit indices are not reported, because the models have not been

compared in this study. Table 4.3 summarises the guidelines for cut-off values to indicate good model fit as recommended by various authors, as discussed in Hooper et al.'s (2008) paper.

Table 4.3 Guidelines for cut-off values to indicate good model fit.

Model Fit Indices	Values to Indicate Good Fit
Chi-Square (X^2)	Low X^2 relative to degrees of freedom Insignificant p value ($p < 0.05$)
RMSEA	≤ 0.05
RMR	≤ 0.05
GFI	≥ 0.90
AGFI	≥ 0.90
PGFI	≥ 0.90

Note. Summarised from Hooper et al. (2008).

In addition to CFA, Rasch Rating Scale Model (RSM) is used to examine the psychometric properties of the measurement scales at the item level (i.e., considering the measurement properties of individual items in a particular scale). CFA is used primarily to review the factor structure (i.e., at the macro level) of the scales, while the Rasch RSM is used to judge the characteristics of individual items (i.e., at the micro level), in terms of how they meet unidimensionality requirements. The following section explains additional details of the Rasch RSM.

4.4.2 Item Analysis using Rasch Rating Scale Model

The Rasch model, which is classified under the family of IRT, is employed in this study to undertake scale item analysis. The Rasch model was developed by Georg Rasch (1960), and was initially published in his *Probabilistic models for some intelligence and attainment tests*. The basic principle of the Rasch model "postulates that the data are the dichotomous outcomes of a probabilistic process governed by a linear combination of parameters, called here the person ability and the item difficulty" (Wright & Mok, 2004, p. 27). To further explain this statement, in the Rasch modelling approach, the probabilistic process is constructed as a logistic function that places a person's ability and test item difficulty on a common scale, known as the logit (i.e., log-odds) scale (Bond & Fox, 2015; Wright, 1999). This allows a person's level of ability to be compared to the difficulty level of the item because they are placed on the common scale, which in turn has the advantage

of addressing several limitations of the CTT models, as cited by scholars such as Embretson (1996), Keeves and Alagumalai (1999) Sharkness and DeAngelo (2011), and Wright (1996).

The CTT models have been utilised to provide solutions to numerous measurement problems (i.e., estimation of measurement error and the collection of multiple forms of validity evidence), however, CTT has been established to have measurement shortcomings because of some model assumptions (Algina & Penfield, 2009) that oppose robust measurement. The basic concept of CTT is expressed as *X* (observed score) = *T* (true score or expected observed score) + *E* (error score) (T. J. B. Kline, 2005; Schumacker, 2010a). Relatively weak assumptions have to be made to solve this equation including: (a) error scores are random and normally distributed, and (b) true scores and error scores are uncorrelated (Hambleton & Jones, 1993; T. J. B. Kline, 2005). There may be other forms of error, such as systematic error, and thus error may not be random in every test (T. J. B. Kline, 2005). It is also reasonable to expect than an individual's true score, such as test taker's ability, is likely to correlate with error score in a situation where the liability of guessing occurs. Additional shortcomings of CTT include: item and test statistics obtained are sample and test dependent, and use of nonlinear raw score as linear measures during statistical analysis procedures (Bond & Fox, 2015; Schumacker, 2010a; Wright, 2012).

The Rasch model involves linear transformation of the observed data to a common scale, which facilitates the comparison of person ability and item difficulty, overcomes the limitation of using nonlinear raw score in CTT models. This also enables the estimation of the standard errors for each person and each item, rather than the CTT's assumptions of randomly and normally distributed errors across respondents. This contributes to the requirement of measurement reliability in Rasch modelling, although the concept is slightly different from the traditional estimates of internal consistency, which use non-linear raw score and include extreme scores that raise concerns relating to appropriateness (E. V. Smith, 2004).

In addition, the underlying principles of the Rasch model offer the advantage of achieving invariant measurement during the presence of good model-data fit (Engelhard, 2013). Invariant, as explained by Bond and Fox (2015), is that the measures yielded from any measurement device should remain invariant across all suitable context. The five basic requirements for invariant measurement include: (a) item-invariant measurement of persons; (b) non-crossing person response function; (c) person-invariant calibration of test items; (d)

non-crossing item response functions; and (e) items and person must be simultaneously located on a single underlying latent variable (Engelhard, 2013, p. 14). These requirements are important in the context of the validation process employed in this study to ensure data used for analysis can yield useful and meaningful inferences. In addition, the Rasch model provides a framework for estimation of a person ability and item difficulty that are sample independent. This is crucial because the sample size of this study is considered reasonably small, while many existing measurement models have strict requirements on sample size, in order to produce optimal results.

The strengths of the Rasch model are not limited only to dichotomous data (data consists of only two possible response formats, such as yes/no), but the simplicity of the algebra permits the model to be extended to cover a range of situations including polytomous data (Keeves & Masters, 1999). This is a great advantage for the polytomously-scored survey items and music performance rating scale used in this study. The survey items mainly employ a five-point Likert type response scale (i.e., strongly disagree, disagree, don't know, agree, strongly agree) and a four-point frequency response scale (i.e., never, sometimes, almost always, always), while the music performance rating scale employs a ten-point response scale (1 indicates lowest scoring and 10 indicates highest scoring). There are two types of model to handle this type of data: Rating Scale Model (RSM) and Partial Credit Model (PCM).

RSM is a derivation of the original Rasch model, developed by Andrich (1978), which requires equal distance across response categories and shares the same response scale structure for all items. PCM is another derivation of the Rasch model, developed by Masters (1982), which allows the distance across response categories to vary, and in which each item may have distinctive response scale structure (Bond & Fox, 2015). In terms of model selection, Wright (1998) suggests that:

> Ultimately it is the meaning of the measures that motivates the choice of model. Consider an attitude survey of 30 items, each presented to the respondents with the same 4 category agreement scale: Strongly Disagree, Disagree, Agree, Strongly agree. When measures are communicated to others, it is impractical and mentally overwhelming to present a different rating scale structure for each item. (p. 641)

This is the main reason RSM has been chosen for scale validation in this study.

Given the advantages of Rasch modelling, its application in the field of music education is fairly recent (e.g., Bond & Bond, 2011; Wesolowski, Wind, & Engelhard, 2015, 2016). Hence, one aim of this study is to promote the understanding and application of the Rasch model in music education research.

The RSM validation procedures were carried out using ConQuest 2.0 (Wu, Adams, Wilson, & Haldane, 2007). ConQuest is a highly specialised software developed for fitting item response and latent regression models (Wu et al., 2007). It is particularly suitable to perform item analysis based on Rasch model that is classified under item response models. In addition, the researcher has worked extensively with this software. ConQuest generates a set of fit indices to investigate the conformity of the observed responses to the measurement model. The fit indices employed are weighted mean square statistic (weighted MNSQ) (or infit MNSQ statistic) and *t* statistic. Weighted MNSQ is "an information weighted indicator of misfit" that is weighted so that "more weight is given to the performances of those persons located closer to the item's difficulty value" (Bond & Fox, 2015, p. 67). The other MNSQ fit statistic, unweighted or outfit MNSQ, takes into account the outlying score (Bond & Fox, 2015). Since outliers are not a concern of this study, the unweighted MNSQ is not considered. Defining the acceptable range of weighted MNSQ is necessary to indicate acceptable item fit. Items with weighted MNSQ that fall outside the acceptable range are considered misfit. Misfitting items are removed during the validation process and recalibrated until all the items exhibited acceptable fit. There are no fixed rules regarding acceptable MNSQ range, but the range varies depending on the purpose and type of test. As suggested by the developer of the ConQuest software regarding item fit, "there are no hard and fast rules for removing items" (M. Wu, personal communication, July 28th, 2015). The chosen range is from 0.60 to 1.40, because of the low stake nature of the survey instrument and music performance rating that have been developed for research purposes only (Bond & Fox, 2015).

However, extra caution is exercised when removing items, because misfitting items may contain important information that is not considered in the study. When a misfitting item is detected, it is imperative to also examine the item thresholds and item discrimination indices. Thresholds are "the boundaries between categories" (Linacre, 2001, p. 794) that show the transition point or the progression from one category to the next (see Figure 4.3) (Bond & Fox, 2015; Linacre, 2001). It is generally perceived that ordered threshold values should be observed (Andrich, 1998). In the event of using a Likert scale (strongly disagree, disagree, agree, and strongly agree), 'failure to agree with' to 'succeed to agree with' would

progress across each threshold in order (Bond & Fox, 2015). Threshold disorder suggests that some categories may not be observed frequently (used frequently by the respondents), and thus, the item can be considered for removal or collapsing adjacent categories (Linacre, 2001).

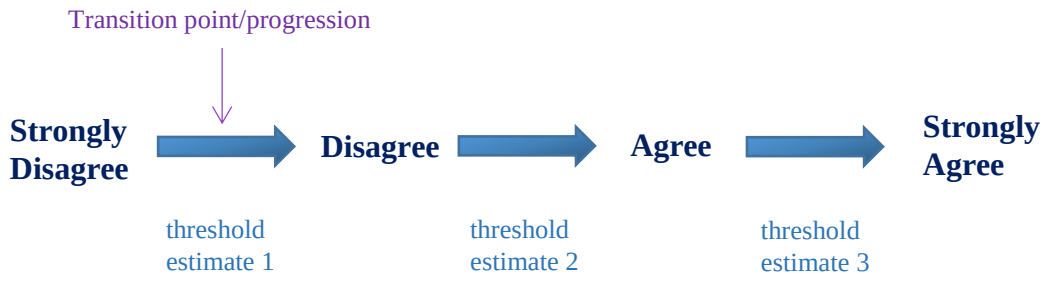


Figure 4.3. Illustration of item thresholds of a rating scale.

Item discrimination indices is "the correlation coefficient between the scores on the item and the scores on the total test and indicates the extent to which an item discriminates between high ability examinees and low ability examinees" (Alagumalai & Curtis, 2005, p. 8). This statement refers to the testing situation. For this study, in the survey and assessment rating situations, item discrimination indices suggest the extent to which an item effectively discriminates between respondents who endorse a particular category in contrast to other category on that item (e.g., choosing 'disagree' against 'strongly disagree' on a five-point Likert scale). A value lower than 0.4 indicates that the item has low discriminating power in terms of separating respondents according to categories such as agreement level on that item (Kelley, Ebel, & Linacre, 2002; Wu & Adams, 2007). Hence, the item can be considered for removal.

The following steps are taken, in terms of examining the item thresholds and item discrimination, when MNSQ statistic indicates a misfitting item: (a) inspect if the item thresholds are in order (item with disordered threshold will be considered for removal or collapsing adjacent categories), (b) when the thresholds are in order, examine the item discrimination (item with negative or relatively low discrimination statistic will be removed), and, (c) when an item exhibits reasonable item discrimination, the item statement is reviewed as to whether the item is measuring what is intended (an item that is not measuring what it purports to measure will be removed). During the recalibration process, it is also important to inspect reliability statistics. Wu suggests that "if the test reliability decreases as a result of the removal of items, then you should consider retaining the items" (personal communication,

July 28, 2015). Finally, although *t* statistic was reported in this study, the sensitivity of *t* statistic to sample size (A. B. Smith, Rush, Fallowfield, Velikova, & Sharpe, 2008; Wu & Adams, 2007) decreases its utility.

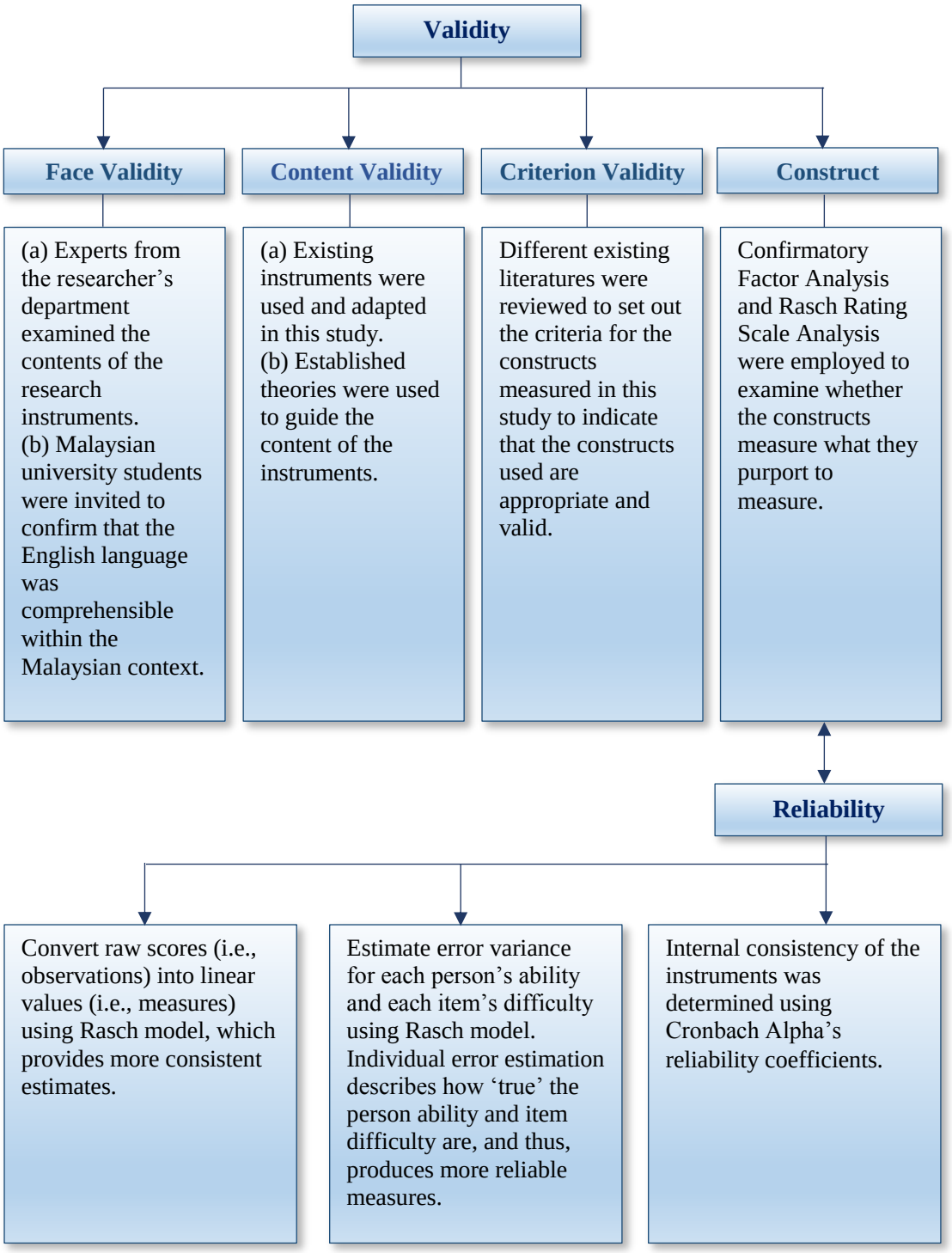


Figure 4.4. Validation of the scales used in the study.

4.5 Quality of the Qualitative Study

As discussed above, validity and reliability are important features within the quantitative context. Undoubtedly, these two components are indispensable in qualitative research as well. However, the nature of qualitative inquiry is essentially different from quantitative study. It is improper to simply apply these two terms – as used in quantitative research – in the qualitative context. In this study, the interview data collected aimed to provide a deeper understanding and rich information on the relationship between students' motivation towards music learning and their learning environment (Creswell, 2013; Kvale, 1996; Polkinghorne, 2005). The analysed and interpreted data was intended to not only assist in confirming the quantitative findings, but also to discover information in addition to the restricted quantitative variables and to take into account perspectives of different individuals. Rigour in the qualitative research component pertaining to the overall trustworthiness of the study is thus particularly important in ensuring that useful and meaningful insights can be obtained.

Various frameworks have been established to address the concerns of validity and reliability with respect to qualitative research. Some researchers have approached qualitative validation using concepts that parallel those of quantitative validation (e.g., LeCompte & Goetz, 1982; L. Leung, 2015; Pyett, 2003). Some have proposed alternative terms considered more applicable within the qualitative inquiry context (e.g., Eisner, 1991; Guba, 1981; Patton, 2015). Still other authors have reconceptualised validity within the qualitative paradigm (e.g., Altheide & Johnson, 2011; Maxwell, 1992; Sousa, 2014). Among all these seminal works, the framework advanced by Guba (1981) has received most attention and remains popular in today's qualitative studies (Creswell, 2013). Guba suggests 'trustworthiness' as a form of validity, presenting four criteria by which to assess research: credibility, transferability, dependability, and confirmability. These criteria are summarised in Table 4.4 in relation to their parallel scientific (or quantitative) concepts, respective quality assessment aspects, and key concepts.

Table 4.4. Criteria for assessing quality of qualitative research.

Qualitative Term	Scientific Term	Aspect	Key Concept
Credibility	Internal validity	Truth value	• Ensuring credibility of the findings and interpretations using various sources from which data were drawn. • Often referred to as 'member check' in which participants are involved in reviewing the data, interpretations, and conclusions so as to judge the accuracy and credibility of the account.
Transferability	External validity/ Generalisability	Applicability	• To determine the extent to which the findings can transfer from one context to another depending on the degree of 'fit' between the contexts. • It is suggested to use thick descriptions to provide audiences or readers with a comprehensive understanding of the research to make their own judgements about transferability.
Dependability	Reliability	Consistency	• Trackability of the alterations made necessary to the research designs because of the changing context. • This is associated with audit trail which increases transparency of the research.
Confirmability	Objectivity	Neutrality	• To provide evidence that the interpretations and findings are rooted in and reflective of the participants' perceptions. • External review is useful to ensure consistency or reliability between the results and participants' perceptions.

Note. Adapted from Creswell (2013), Given (2008), and Guba (1981, pp. 80-81).

Regardless of the diverse existing perspectives and criteria, 'accuracy' remains central in many discussions on assessment and evaluation of the quality of qualitative research (e.g., Altheide & Johnson, 2011; Creswell, 2013; Flick, 2014). Thus, Creswell (2013) suggests that researchers employ criteria and strategies appropriate to their study context to establish the 'accuracy' of findings through rigorous research procedures. The four criteria advanced by Guba (1981) have been used to guide the quality assessment of the qualitative component of this study, as outlined in the following section.

4.6 Strategies Used to Maintain Quality of the Qualitative Study

Qualitative research focuses on understanding the social phenomena of individuals, groups, and cultures through the interpretation of a researcher. Denzin and Lincoln (2011) suggest that the world view of 'researcher-as-interpretive-*bricoleur*' (p. 91) guides the qualitative research practice. Hence, presumably, good judgement of the researcher is required to establish accuracy and rigour, which is in contrast to quantitative research which uses variables and a measurement model (Guest et al., 2012). There is no one 'right' strategy, but the chosen strategies should be appropriate within the research context and fit the research purposes (Flick, 2014). The strategies employed in this study follow Guest et al.'s (2012) proposed methods, which have been developed specifically for qualitative research using thematic analysis, and adhere to the requirements of credibility, transferability, dependability, and confirmability. Table 4.5 summarises the strategies used to maintain the quality of the qualitative component of this study.

Table 4.5. Strategies used to maintain the quality of the qualitative research.

Strategies	Criteria
Transcribe data using transcription protocol	• Transcription provides verbatim account of data collection event, thereby enhancing validity. • Using a transcription protocol ensures that transcription is done consistently, and is of the appropriate type for the analytic aims.
Establish translation expectations at beginning	• Translation techniques and styles vary greatly. Establishing the translation approach up-front increases the likelihood that data will be useful for the analysis planned.
Develop and use a precise codebook	• Good codebooks facilitate data comparison, if using the same codes in a different study.

	• Codebooks serve as documentation of the themes relevant to a given analysis, and provide easy access to code meanings for internal reviews.
External and/or peer review of coding and summaries	• Outside review facilitates coding reliability by providing checks on individual biases and variance in interpretation of code definitions.
Create an audit trail	• Documentation of analysis steps and codebook revisions makes the analysis process more transparent for other researcher to review. • An audit trail facilitates internal review of processes and the ability to accurately replicate procedures, if desired.
Negative case analysis	• Consciously including negative cases in an analysis mitigates analyst biases by forcing the analyst to look for and report any evidence contrary to prevailing patterns identified in the data.
Support themes and interpretations with quotes	• Using verbatim quotes increases the validity of findings by directly connecting the researcher's interpretations with what participants actually said.

Note. Adapted and modified from Guest et al. (2012, pp. 99-101).

The details and documentation relating to each strategy are described and provided in the following chapter. Strategies that were applied during the analysis process (i.e., negative case analysis, support themes, and interpretations with quotes) are demonstrated in chapter 7 and 8, which report the analysis procedures and results. However, the outlined strategies are applied within the data analysis context. The process of ensuring the quality of the qualitative research is not limited to the data analysis stage only, but rather commenced at the research design stage. During the research design stage, the paradigm used by the researcher to inform and guide the study was defined (see Chapter 3). As stated by Creswell (2013), "a close tie does exist between the philosophy that one brings to the research act and how one proceeds to use a framework to shroud his or her inquiry" (p. 15). Providing a detailed description of beliefs and philosophical assumptions helps the audience to understand the researcher's stance and evaluate her research in a fair and accurate manner. In addition, experts were invited to review the qualitative instrument – the semi-structured interview guide – ensuring that the questions related to the purpose of this study and would make sense to the participants. During the data collection stage, the researcher pre-tested the questions and adjusted them based on feedback, so as to increase the relevance of the questions to the study topic. These processes are important in improving the accuracy of the

data collected. Only if data collected are truthful and reliable can inferences made from the interpretation of the data be considered trustworthy.

4.7 Summary

There are two important aspects conveyed in this chapter: (a) the validity and reliability in the context of the quantitative component of this study, and (b) the trustworthiness of its qualitative component. These aspects are vital to ensuring rigour and quality in this mixed-methods research study, so as to yield meaningful data and be able to make useful inferences from the study's findings. In order to ensure that the requirements for these two aspects are achieved, validation procedures are carried out for quantitative component and different strategies are employed for qualitative component.

For quantitative research, rigour lies in the use of sound measurement processes, particularly in terms of validity and reliability. Validity ensures that the scales used to assess a particular construct measures what it intends to measure. Reliability ensures consistency of the scores yielded from the scales. There are four key aspects measured in the current study: (a) motivation towards learning instrumental music, (b) home learning environment, (c) self-regulation, and (d) measured achievement of music performance. It was imperative to carry out validation procedures to examine the validity and reliability of the scales so as to make sure that their adaptation from existing scales was appropriate and accurate within the context of the present study. CFA and Rasch models, which are complementary, were employed to guide the validation procedures. CFA was used to examine the factor structure of the scales, and Rasch model was used to examine the unidimensionality of the scales. CFA and Rasch analysis were carried out using appropriate statistical procedures at each stage.

The quality of the qualitative component of this study has been assured using strategies specific to qualitative inquiry. The strategies are used to *enhance* rather than *examine* the quality of the study, as is the case in the quantitative component of the study. The reason is due to the nature of qualitative data that are essentially interpretive and descriptive, and that employing statistical procedures is not appropriate within the qualitative context (Guest et al., 2012). In qualitative research, quality is associated with trustworthiness, which consists of four key criteria: credibility, transferability, dependability, and confirmability. These criteria were outlined to ensure the accuracy of the qualitative data and the meaningfulness

of the interpretations drawn from them. The strategies employed include an explicit research paradigm, external/peer review, development of codebook, member check, and audit trail. These strategies are used, as appropriate, in different phase of the study.

Finally, this chapter provides details about the theoretical background and procedures employed to ensure that the quantitative and qualitative data are precise and accurate for subsequent data analyses. The results of the validation procedures and further descriptions on the strategies employed to ensure the quality of the qualitative component of this study are provided in Chapter 5.

Chapter 5:
Instrument Validation and Quality of Qualitative Study

5.1 Introduction

The aims of this chapter are to discuss the results of the statistical analyses carried out to validate each scale used in the quantitative component of this study, and to describe the procedures employed so as to maintain the quality of the qualitative component of this study. For the quantitative component, there are four scaled instruments used to investigate the relationships among the factors, as guided by the research questions (see Chapter 1): (a) student motivation towards learning instrumental music (SMLIM), (b) parental involvement (PI), (c) self-regulation (SR), and (d) music performance rating scale (MPRS). As each of the instruments consists of scales adapted from various existing instruments (to best suit the context of this study), validation is especially important so as to ensure analysis results yield meaningful and useful inferences. For the qualitative component, the procedures from data collection to data analysis have been recorded systematically to create an audit trail. Various strategies have also been undertaken to ensure credibility, transferability, dependability, and confirmability.

This chapter is divided into five main sections. The first four sections consist of a brief description of the development of the instrument, and the items adapted to represent the observed variables are provided. Next, the structural and item level analyses of the scales using CFA and Rasch modelling, respectively, are discussed. In the next section of the chapter, the terms 'latent variable' and 'factor' are used interchangeably to indicate unobserved variable, trait, or construct. The fifth section discusses the strategies employed to maintain the quality of qualitative study. A summary is provided at the end of the chapter.

5.2 The "Student Motivation towards Learning Instrumental Music" (SMLIM) Instrument

Student motivation has been considered an influential factor in instrumental music learning; motivated behaviours such as students' choice to practise a challenging musical piece, and engagement in productive practice sessions (finding appropriate strategies to practise a difficult passage) are important aspects for successful learning outcomes (Austin et al., 2006; Linnenbrink-Garcia et al., 2011). The measures of motivation have been

determined by various observable behaviours identified in motivational theories, such as attribution theory (Weiner, 1985), need theory (McClelland, 1985), self-determination theory (Deci, 1980; Deci & Ryan, 1985) and expectancy x value theory (Eccles, 1983). The SMLIM instrument used in this study was developed based on the expectancy x value theory (see Chapter 2). This instrument consists of four scales, designed to measure student motivation:

a) *Self-concept*: students' self-perceived ability in general music learning
b) *Self-efficacy*: students' self-perceived ability in musical performance
c) *Personal interest*: students' personal interest in music
d) *Perceived values*: students' perceived values of learning music to obtain personal satisfaction and future job.

Details regarding the development of these scales are provided in Chapter 3. Each of the scales consists of six items. A five-point Likert-type response scale is used with response categories, including 1 – strongly disagree, 2 – disagree, 3 – don't know, 4 – agree, and 5 – strongly agree. For the purpose of data analysis, a prefix is assigned for each of the motivational measures: *SelCon* for self-concept, *SelEff* for self-efficacy, *PerInt* for personal interest, and *PerVal* for perceived values. These scales consist of positive and negatively worded statements. Negatively-worded items are 'reversed scored' to keep the scoring consistent. Table 5.1 provides a summary of the items used in the SMILM instrument, including item code, nature of the item statement, and item text.

Table 5.1. Item summary of the SMLIM instrument.

Item Code	Statement Nature	Item Text
Self-Concept		
SelCon1	Positive	I am satisfied with how well I do in my music degree
SelCon2	Positive	I learn things in music quickly
SelCon3	Positive	Compared to my classmates, I am good at music
SelCon4	Negative	I can never achieve good marks in music even if I work hard
SelCon5	Positive	I usually get good marks in music
SelCon6	Positive	Work in music is easy for me
Self-Efficacy		
SelEff1	Positive	Music performance is not too difficult for me
SelEff2	Positive	I believe I can become very good at playing my musical instrument

SelEff3	Positive	When I set music performing goals for myself, I am sure I can achieve them
SelEff4	Positive	I expect to be known as a good music performer
SelEff5	Positive	I feel I can solve any musical problem I meet
SelEff6	Positive	I am confident in my ability to improve on my music playing
Personal Interest		
PerInt1	Negative	I only practice when I have to perform music
PerInt2	Positive	I like talking about music with other people
PerInt3	Positive	I enjoy learning new musical pieces
PerInt4	Positive	I enjoy going to musical concerts
PerInt5	Positive	I like to practice difficult musical pieces
PerInt6	Positive	I enjoy the challenges in my music practice sessions
Perceived Values		
PerVal1	Positive	Working hard in music is important to help me get the job I want
PerVal2	Positive	I would like to spend all my future life time working in music related job
PerVal3	Positive	I study music because I know it is useful for me
PerVal4	Positive	If I can play music better I will be able to get a better job
PerVal5	Positive	I want to do well in music because this will show my ability to others
PerVal6	Positive	Doing well in music will give me chance to perform in different countries

5.2.1 SMLIM Instrument: Confirmatory Factor Analysis

This section discusses and presents the structural analysis results of the SMLIM instrument using confirmatory factor analysis (CFA) approach. CFA is employed to examine the hypothesised relationships between the observed and latent variables of student motivation towards learning instrumental music. Each scale from the SMLIM instrument is subjected to a one-factor CFA to examine if the latent variable (e.g., self-concept) is reflected by all the observed variables, also referred to as items (e.g., SelCon1, SelCon2, SelCon3). The hypothesised model of each scale for the SMLIM instrument is presented in Figure 5.1. The rationale of employing a one-factor CFA, rather than other models such as correlated factors and hierarchical factors, is due to these scales being developed individually based on different existing instruments. Highly specialised statistical software, LISREL, is used to carry out CFA (Jöreskog & Sörbom, 2006). A set of model fit indicators, including factor loadings and model fit indices, is used to examine how the hypothesised models fit into the

data. Detailed descriptions of the indices used to examine the structure of the scales, and values used to indicate good model fit in this study are provided in Chapter 4.

The CFA analysis results are presented in Table 5.2, showing the loading values of each observed variable onto the latent variables. An observed variable should have a minimum factor loading value of ±0.30 to indicate good model fit to the data (see Chapter 4 threshold values used). All except three of the items load reasonably well to their respective latent variables. The three items, SelCon4 (0.01), SelEff1 (0.37), and PerInt1 (0.395) do not appear to be reflective of their respective latent construct. Model fit indicators are provided in Table 5.3. Using the indices GFI, AGFI, and PGFI, SelCon, SelEff, PerInt, and PerVal appear to have poor model fit. PGFI, which indicates model parsimony ('simpleness'), shows values that are way too low compared to the accepted threshold value, indicating that the models have complex structures. This is further supported by most of the RMR and RMSEA values that are higher than 0.05 (which indicates a poor fitting model). A number of factors, including sample size and 'data noise' (Hooper et al., 2008; Iacobucci, 2010), might have contributed to this. However, further supporting information about model fit is needed, as the LISREL results did not show any warnings when the analyses were carried out. Thus, examination of individual items was considered warranted.

Using SPSS, the reliability analysis (for internal consistency) of the scales in SMLIM instrument, results in Cronbach alpha (α) values ranging from 0.64 to 0.82. Self-concept scale, in particular, shows a value of 0.64 that is below the acceptable value of 0.70 for reliability. However, there are a number of factors that can deflate the alpha: the number of test items, inter-relatedness between items, and dimensionality of the scale (Tavakol & Dennick, 2011). Thus, further examination for unidimensionality using item analytic technique based on Rasch model is carried out. This is discussed in the following section. The other three scales – self-efficacy, personal interest, and perceived value – exhibit acceptable alpha values above 0.70 (see Table 5.2).

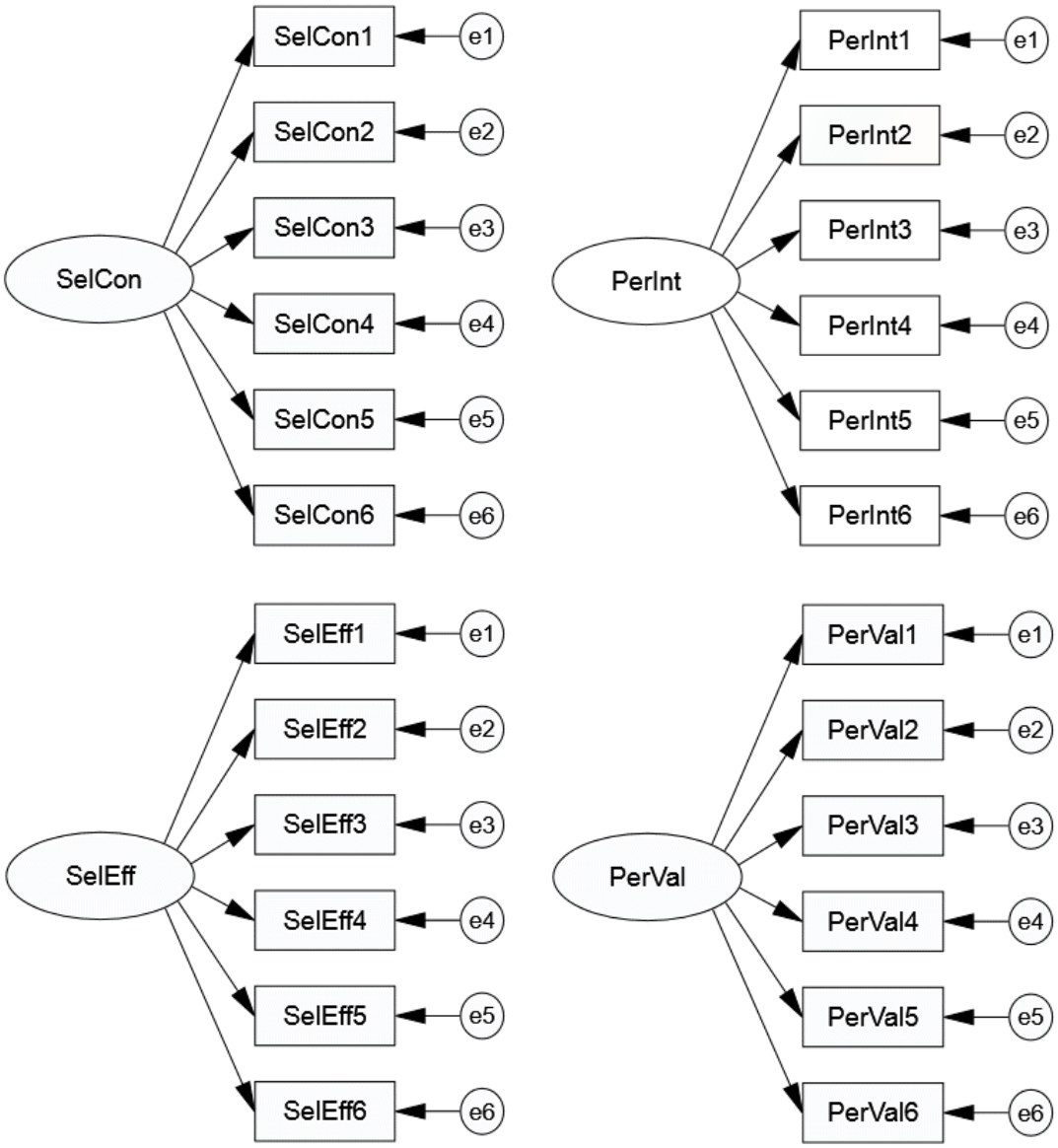


Figure 5.1. The hypothesised model of one-factor CFA (SMLIM instrument).

SelCon – self-concept scale; SelEff – self-efficacy scale; PerInt – personal interest scale; and PerVal – perceived value scale.

Table 5.2. Factor loadings of one-factor model for latent variables in SMLIM instrument.

	Factor Loadings			
Variables	**SelCon**	**SelEff**	**PerInt**	**PerVal**
SelCon1	0.53 (0.05)			
SelCon2	0.80 (0.05)			
SelCon3	0.68 (0.05)			
SelCon4	0.01 (0.06)			
SelCon5	0.69 (0.05)			
SelCon6	0.65 (0.05)			
(α = 0.64)				
SelEff1		0.37 (0.05)		
SelEff2		0.84 (0.04)		
SelEff3		0.91 (0.04)		
SelEff4		0.76 (0.05)		
SelEff5		0.54 (0.05)		
SelEff6		0.80 (0.04)		
(α = 0.81)				
PerInt1			0.40 (0.05)	
PerInt2			0.65 (0.05)	
PerInt3			0.87 (0.04)	
PerInt4			0.66 (0.05)	
PerInt5			0.68 (0.05)	
PerInt6			0.66 (0.05)	
(α = 0.74)				
PerVal1				0.81 (0.04)
PerVal2				0.68 (0.04)
PerVal3				0.76 (0.04)
PerVal4				0.72 (0.05)
PerVal5				0.72 (0.05)
PerVal6				0.68 (0.05)
(α = 0.82)				

Table 5.3. Model fit indices for latent variables in SMLIM instrument.

Model Fit Indices	Statistics			
	SelCon	SelEff	PerInt	PerVal
Chi-Square	42.05	54.92	185.79	144.97
df	9	9	9	9
GFI	0.97	0.95	0.86	0.88
AGFI	0.93	0.89	0.67	0.72
PGFI	0.42	0.41	0.37	0.38
RMR	0.05	0.04	0.09	0.07
RMSEA	0.09	0.12	0.23	0.21

5.2.2 SMLIM Instrument: Item Analysis using Rasch Rating Scale Model

Analysis based on the Rasch rating scale model is undertaken, in addition to CFA, to examine the individual scale item psychometric characteristics and properties. This process involves fitting the data into the model. In this section, the item analysis results for the constructs employed in the SMLIM instrument are discussed. The ConQuest 2.0 software has been used to carry out the item analysis (Wu et al., 2007). The assessment of the unidimensionality of the items used to reflect each of the constructs in the SMLIM instrument involves examining the item fit statistics. The weighted mean square statistic, or infit mean square statistic, is used as the basis to examine item fit. In this study, items with weighted mean square values that fall outside the range of 0.60 to 1.40 are considered misfitting, and thus considered for removal. However, extreme care is taken when removing a misfitting item. Details regarding other cautions undertaken when examining the item fit and removing an item have been discussed in Chapter 4. In addition, a *t* value outside the range of -2.0 to 2.0 is regarded as a misfit. However, as *t* statistic is sensitive to sample size (Wu & Adams, 2007), the *t* statistic is not taken into account, but rather functions as a reference in this study.

Each of four constructs consists of six items in the SMILM instrument; these are subjected to item analysis using the Rasch rating scale model. The item analysis results of each construct – SelCon, SelEff, PerInt, and PerVal – are presented in Table 5.4. These results show the final model of each construct, where detected misfitting items have already been removed. The following items have been removed from their respective constructs: SelCon4 (weighted MNSQ = 1.91, t = 10.1), SelEff1 (weighted MNSQ = 1.52, t = 6.4) and PerInt1 (weighted MNSQ = 1.62, t = 6.8). Item texts for both SelCon4 item (I *can never* achieve good marks in music even if I work hard) and SelEff1 item (music performance is

not too difficult for me) have been identified to consist of double negative wordings. Sentence with double negative wordings may be confusing for the Malaysian respondents, especially given that English is not their native language. Item PerInt1 (I only practice when I have to perform music) was found to suggest a specific musical task rather than students' interest in music performance. After removing these three items, the results indicate that the weighted mean square values for the rest of the items fall within the acceptable range. In addition, the three misfitting items are found to be consistent with the CFA results indicating that they do not load well to their respective construct. Therefore, these items are not included in their respective constructs for subsequent path analyses.

Table 5.4. Item analysis results for constructs in SMLIM instrument.

			Weighted Fit		
Variables	**Estimate**	**Error**	**MNSQ**	**CI**	***t***
SelCon1	-0.23	0.05	1.31	(0.86, 1.14)	4.0
SelCon2	-0.29	0.05	0.85	(0.86, 1.14)	-2.3
SelCon3	0.80	0.05	0.80	(0.86, 1.14)	-3.1
SelCon5	-0.35	0.05	0.79	(0.86, 1.14)	-3.1
SelCon6	0.08	0.10	1.18	(0.86, 1.14)	2.5
SelEff2	-0.60	0.08	0.95	(0.85, 1.15)	-0.7
SelEff3	-0.42	0.08	0.81	(0.85, 1.15)	-2.7
SelEff4	0.27	0.08	1.26	(0.85, 1.15)	3.2
SelEff5	1.10	0.09	1.24	(0.85, 1.14)	3.1
SelEff6	-0.35	0.08	0.85	(0.85, 1.15)	-2.0
PerInt2	-0.04	0.08	1.07	(0.84, 1.16)	0.9
PerInt3	-0.34	0.09	0.82	(0.85, 1.15)	-2.4
PerInt4	-0.98	0.09	1.11	(0.85, 1.15)	1.4
PerInt5	1.04	0.09	1.07	(0.85, 1.15)	0.9
PerInt6	0.32	0.08	1.05	(0.84, 1.16)	0.6
PerVal1	-0.22	0.06	1.03	(0.83, 1.17)	0.3
PerVal2	0.13	0.06	1.12	(0.83, 1.17)	1.4
PerVal3	-0.24	0.06	0.77	(0.83, 1.17)	-2.9
PerVal4	0.10	0.06	1.17	(0.83, 1.17)	1.9
PerVal5	0.35	0.07	1.12	(0.84, 1.16)	1.4
PerVal6	-0.12	0.13	0.94	(0.83, 1.17)	-0.7

5.3 The "Parental Involvement" (PI) Instrument

The parents' role in providing a musical learning environment for their children at home and supporting their children's music learning is investigated in this study. As Zdzinski had conducted an extensive range of parental involvement research in the music field (Zdzinski, 1992, 1996, 2002, 2011), his instrument has been adapted to develop the PI instrument, which consists of two scales:

a) *Early parental involvement*: The frequency of parental involvement in students' music learning activities during childhood based on students' perception.

b) *Current parental involvement*: The frequency of parental involvement in students' current music learning activities at the university level based on students' perception.

As the original instrument developed by Zdzinski was used to measure parental involvement at the middle school level, and considering that parental involvement is of equal importance in contributing to students' music learning process at the university level, the current parental involvement scale is included in the PI instrument. The items used to measure early parental involvement and current parental involvement are similar. The early parental involvement scale consists of 12 items, and the current parental involvement scale consists of seven items. For the purpose of data analysis, items for the early parental involvement scale have been designated with a prefix of *PInvE* and items for current parental involvement scale with a prefix of *PInvC*. A four-point frequency response scale is used where 1 is never, 2 is sometimes, 3 is almost always, and 4 is always. Table 5.5 provides a summary of the item code corresponding to the item text for the PI instrument used in this study.

Table 5.5. Item summary of the PI instrument.

Item Code	Item Text
Early Parental Involvement	
PInvE1	Sing with you
PInvE2	Play musical instrument with you
PInvE3	Talk about music with you
PInvE4	Listen to music recordings with you at home
PInvE5	Ask about your music learning process
PInvE6	Listen to your music practice sessions
PInvE7	Take you to musical concerts
PInvE8	Attend your music rehearsals
PInvE9	Attend your musical concerts
PInvE10	Record your music performance
PInvE11	Provide transport to your musical activities

PInvE12	Provide you money for musical activities and materials
Current Parental Involvement	
PInvC1	Ask about your music learning process
PinvC2	Listen to your music practice sessions
PInvC3	Attend your music rehearsals
PInvC4	Attend your musical concerts
PInvC5	Record your music performance
PInvC6	Provide transport to your musical activities
PInvC7	Provide you money for musical activities and materials

5.3.1 PI Instrument: Confirmatory Factor Analysis

The structure of the PI instrument is analysed using one-factor CFA similar to the statistical analyses carried out to examine the structure of the SMLIM instrument in the previous section. There are two latent variables included in the PI instrument: PInvE and PInvC. CFA is undertaken separately to examine the structure of each latent variable because PInvE and PInvC have been developed based on different concepts, where PInvE variable intends to measure parental involvement during a student's early stage music learning process. PInvC variable intends to measure current parental involvement in student's music learning processes at the university. The hypothesised model for PInvE and PInvC is shown in Figure 5.2. The results (Table 5.6) suggest that, except for the low factor loading of PInvC7 (0.21), all the other items load reasonably well onto their respective latent variables, ranging from a modest 0.48 to a high loading of 0.95. The model fit indices results suggest that both PInvE and PInvC have poor model fit (see Table 5.7). The GFI, AGFI, and PGFI values are way lower than the acceptable fit index value of 0.90. Additionally, the RMR and RMSEA values are much higher than the 0.05 threshold that indicates good model fit. However, as mentioned before, there are several factors such as sample size and 'data noise' which could affect the model fit results (Hooper et al., 2008; Iacobucci, 2010). Hence, PInvE and PInvC were subjected to subsequent item analysis using the Rasch rating scale model to further examine the fit of individual items.

Internal consistency/reliability has been examined using Cronbach's alpha coefficient. The results show that the early parental involvement scale has an alpha value of 0.88, and the current parental involvement scale has an alpha value of 0.82 (Table 5.6). These values are above 0.70 to indicate acceptable reliability.

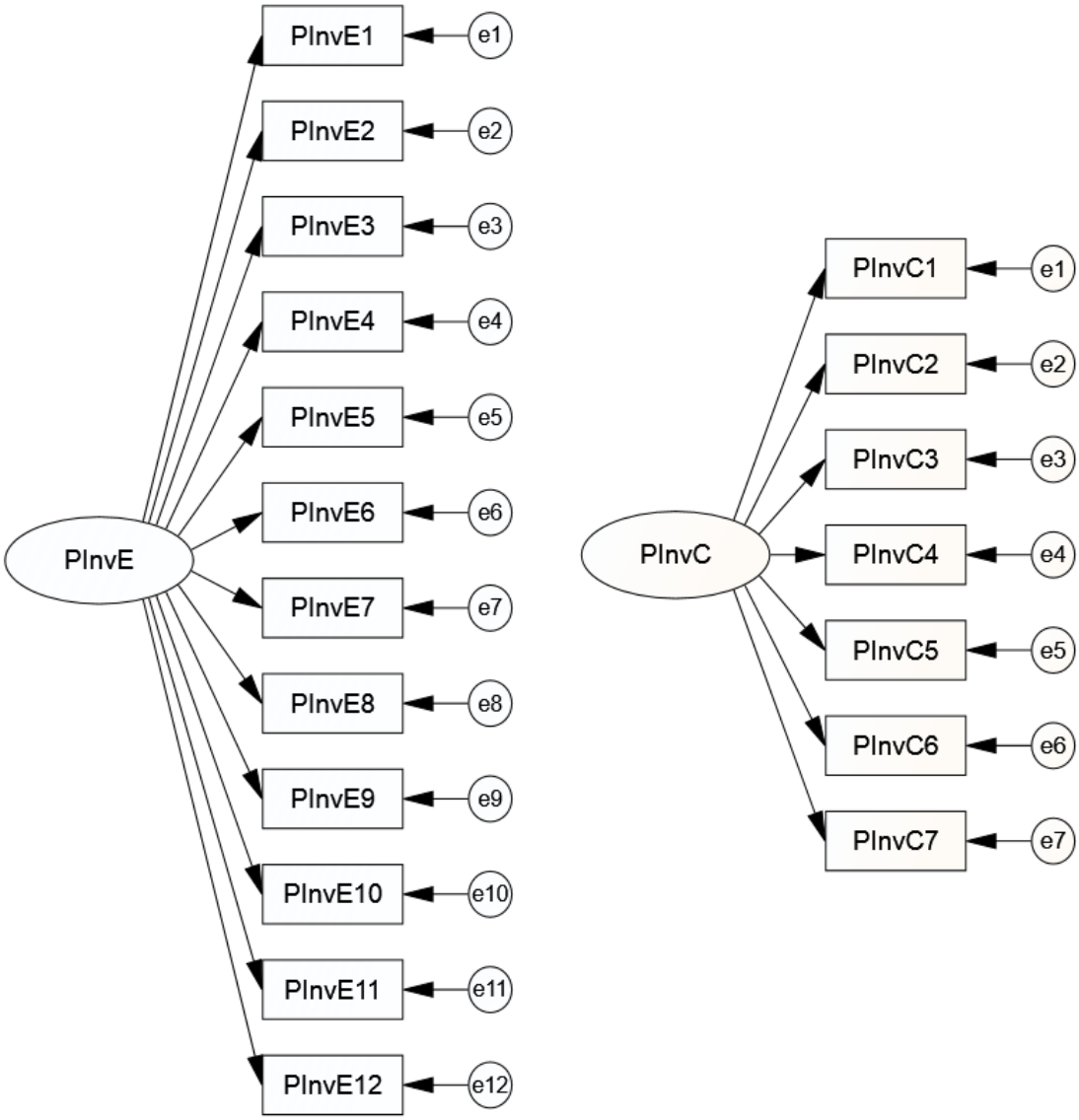


Figure 5.2. The hypothesised model of one-factor CFA (PI instrument).

PInvE – early parental involvement scale, and PInvC – current parental involvement scale.

Table 5.6. Factor loadings of one-factor model for latent variables in PI instrument.

	Factor Loadings	
Variables	**PInvE**	**PInvC**
PInvE1	0.55 (0.05)	
PInvE2	0.55 (0.05)	
PInvE3	0.64 (0.05)	
PInvE4	0.62 (0.05)	
PInvE5	0.64 (0.05)	
PInvE6	0.68 (0.05)	
PInvE7	0.80 (0.04)	
PInvE8	0.80 (0.04)	
PInvE9	0.81 (0.04)	
PInvE10	0.81 (0.04)	
PInvE11	0.58 (0.05)	
PInvE12	0.54 (0.05)	
(α = 0.88)		
PInvC1		0.48 (0.05)
PInvC2		0.58 (0.05)
PInvC3		0.85 (0.04)
PInvC4		0.95 (0.04)
PInvC5		0.88 (0.04)
PInvC6		0.58 (0.05)
PInvC7		0.21 (0.05)
(α = 0.82)		

Table 5.7. Model fit indices for latent variables in PI instrument.

	Statistics	
Model Fit Indices	**PInvE**	**PInvC**
Chi-Square	1098.12	397.83
df	54	14
GFI	0.63	0.75
AGFI	0.47	0.50
PGFI	0.44	0.38
RMR	0.12	0.14
RMSEA	0.25	0.28

5.3.2 PI Instrument: Item Analysis using Rasch Rating Scale Model

The item analysis results for the PInvE and PInvC constructs are shown in Table 5.8. Overall, PInvE items and PInvC items exhibit acceptable weighted MNSQ fit. In contrast to the CFA results, which indicate that PInvC7 was not loading well to the PInvC construct, the item analysis results suggest that PInvC was measuring PInvC construct. It was decided that all the items would be retained for the PInvC construct because item analysis results based on Rasch rating scale model explain the variance of each item, confirming the unidimensionality of all the items to measure PInvC construct (Bond & Fox, 2015). For the PInvE construct, the item analysis results were consistent with the CFA results that all the items were loading well to reflect the PInvE construct and exhibited acceptable weighted MNSQ fit. All the items have been retained for the PInvE construct.

Table 5.8. Item analysis results for constructs in PI instrument.

			Weighted Fit		
Variables	**Estimate**	**Error**	**MNSQ**	**CI**	***t***
PInvE1	-0.07	0.05	0.99	(0.87, 1.13)	-0.2
PInvE2	0.89	0.05	1.18	(0.84, 1.16)	2.1
PInvE3	-0.01	0.05	0.84	(0.87, 1.13)	-2.4
PInvE4	-0.22	0.05	0.91	(0.87, 1.13)	-1.3
PInvE5	-0.51	0.05	0.95	(0.87, 1.13)	-0.7
PInvE6	-0.09	0.05	0.89	(0.87, 1.13)	-1.7
PInvE7	0.88	0.05	0.88	(0.84, 1.16)	-1.6
PInvE8	0.87	0.05	1.00	(0.85, 1.15)	0.1
PInvE9	0.31	0.05	1.05	(0.86, 1.14)	0.8
PInvE10	0.86	0.05	1.13	(0.85, 1.15)	1.6
PInvE11	-1.13	0.05	1.32	(0.87, 1.13)	4.2
PInvE12	-1.78	0.17	1.16	(0.84, 1.16)	1.9
PInvC1	-0.70	0.05	0.89	(0.87, 1.13)	-1.7
PInvC2	0.21	0.05	0.95	(0.86, 1.14)	-0.7
PInvC3	1.10	0.05	0.88	(0.84, 1.16)	-1.5
PInvC4	0.55	0.05	0.93	(0.86, 1.14)	-0.9
PInvC5	1.07	0.05	0.99	(0.84, 1.16)	-0.1
PInvC6	-0.65	0.05	1.22	(0.87, 1.13)	3.0
PInvC7	-1.57	0.12	1.26	(0.84, 1.16)	3.0

5.4 The "Self-Regulation" (SR) Instrument

The SR instrument consists of four scales to measure different dimensions of self-regulatory approaches adopted by students during their practice sessions in order for them to achieve their goals of learning. These scales were developed based mainly on Miksza's (2012) SRPBQ instrument. Details of the development of the self-regulation scales are provided in Chapter 3. These four scales are:

a) *Method* (13 items): Self-instructed learning strategies applied by students to practise and master musical pieces.
b) *Behaviour* (5 items): Students' ability to reflect and monitor their own music learning process.
c) *Time management* (5 items): Students' ability to concentrate during their practice sessions and plan their practice schedule.
d) *Help seeking* (6 items): Students' engagement in various resources to help them to achieve their music learning goals.

Each of the self-regulation measures are designated with a prefix for data analysis purposes: *SRegM* for method, *SRegB* for behaviour, *SRegTM* for time management, and *SRegHS* for help seeking. There are positive and negatively worded statements. Negatively-worded items are reversed scored to keep the scoring consistent. A four-point frequency response scale, the same as the PI instrument's response scale, is used. Table 5.9 provides a summary of the items used in the SR instrument, including item code, nature of the item statement, and item text.

Table 5.9. Item summary of the SR instrument.

Item Code	Statement Nature	Item Text
Method		
SRegM1	Positive	I select important technical and musical parts repeat practicing them over and over again
SRegM2	Positive	I spend more time practicing difficult sections
SRegM3	Positive	When I practice, I try to find the most important musical ideas
SRegM4	Positive	I carefully look through a new musical piece before practising
SRegM5	Positive	I begin each practice sessions with warm-ups
SRegM6	Positive	I use what I have learned in the past to practice new musical pieces
SRegM7	Positive	I make connections between my understanding from listening to music and from teachers

SRegM8	Positive	I mark difficult parts in music when practicing
SRegM9	Positive	I practice difficult parts using different methods
SRegM10	Positive	I set specific practice goals
SRegM11	Negative	When I find a musical piece is difficult, I give up practicing it
SRegM12	Positive	I practice difficult music even I am not asked to do so
SRegM13	Positive	I spend some practice time to sight read new music
Behaviour		
SRegB1	Positive	I try to get one section of music perfect before practicing the next section
SRegB2	Positive	I think about musical pieces I practice by singing the music in my mind
SRegB3	Positive	If I cannot play a musical piece correctly, I stop to think about how it should sound
SRegB4	Positive	I practice to see how much better I can actually get at music
SRegB5	Positive	When I have problem with a difficult section, I try to think about the best way to work out the problem
Time Management		
SRegTM1	Negative	I can only concentrate for short periods of time when practicing
SRegTM2	Negative	I find it hard to stick to a practice schedule
SRegTM3	Negative	I am easily distracted when practicing
SRegTM4	Negative	I think about things not related to music when I practice
SRegTM5	Positive	It is easy for me to focus on my music when I am practicing alone
Help Seeking		
SRegHS1	Positive	I ask my teacher for help when practicing difficult music
SRegHS2	Positive	I use my teacher's advice when practicing
SRegHS3	Positive	I ask my classmates for help when I have problem learning the music
SRegHS4	Positive	I often rehearse by performing music for a classmate or a friend
SRegHS5	Positive	I listen to musical recordings to help me learn
SRegHS6	Positive	I look up books for musical information to help me learn

5.4.1 SR Instrument: Confirmatory Factor Analysis

Four correlated factor CFA and hierarchical factor CFA were initially considered to examine the structure of the SR instrument. The correlated factor model consists of correlated first-order factors that are reflected by their observed variables (Figure 5.3). The reason for conducting correlated factor CFA was that the SR instrument used in this study was adapted from Miksza's (2012) SRPBQ instrument, which had been validated using a

CFA approach wherein the results suggested that the correlated factor model may represent the self-regulation model. The correlated factor CFA results for SR instrument used in this study showed that the correlation among the latent variables was fairly high, ranging from 0.74 to 0.86. However, SRegTM had very low correlation with other latent variables (SRegM, SRegB, and SRegHS), ranging from -0.07 to 0.01.

Subsequent hierarchical factor CFA was conducted because the high correlation between the first-order factors may have been represented by single second-order factor (Figure 5.4). The results are consistent with the correlated factor CFA results that SRegTM does not reflect the single second-order self-regulation factor, as its loading is -0.003. In addition, most of the model fit indices suggest that the correlated and hierarchical factor models have poor fit (Table 5.10). Thus, it was decided that each latent variable would be subjected to one-factor CFA (Figure 5.5).

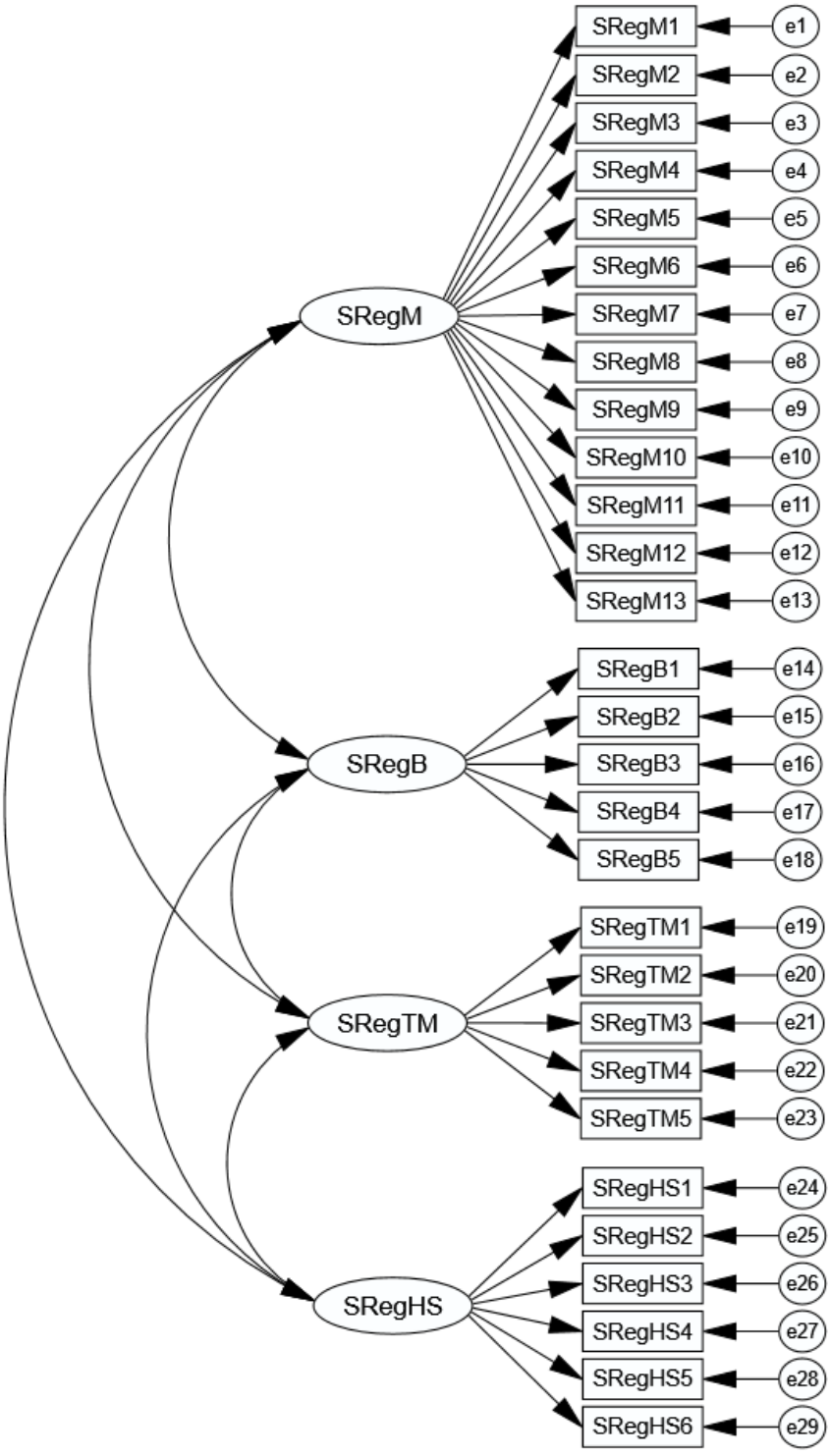


Figure 5.3. The hypothesised model of four correlated factor model (SR instrument).

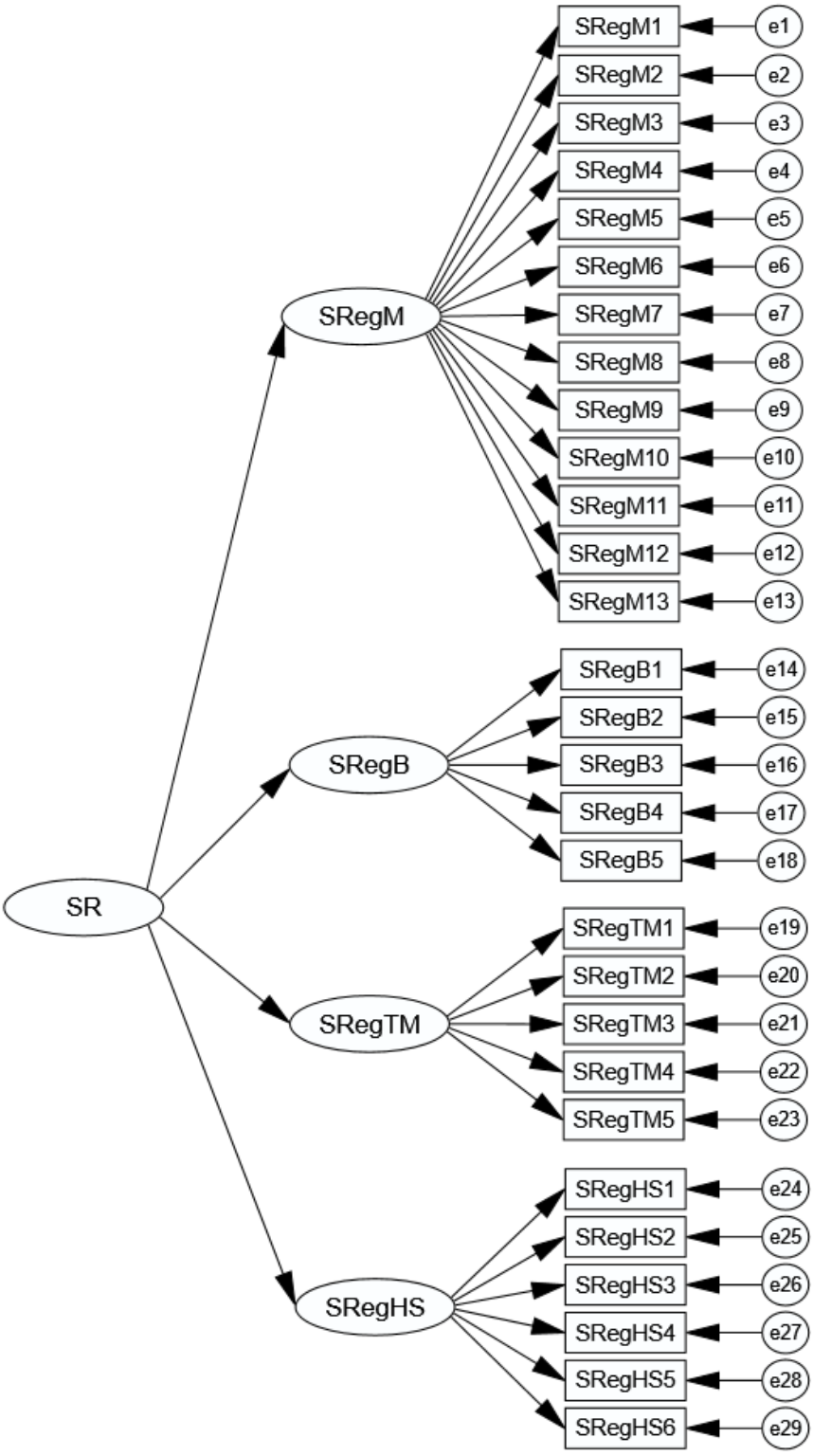


Figure 5.4. The hypothesised model of hierarchical factor model (SR instrument).

Table 5.10. Model fit indices for four correlated and hierarchical factor models (SR instrument).

	Statistics	
Model Fit Indices	**Four correlated factor model**	**Hierarchical factor model**
Chi-Square	1615.06	1618.10
df	371	373
GFI	0.77	0.77
AGFI	0.73	0.73
PGFI	0.66	0.66
RMR	0.09	0.09
RMSEA	0.09	0.09

The results of one-factor CFA are presented in Table 5.11. There are several observed variables found to not load well onto their respective latent variables: SRegM11 (0.09), SRegM12 (0.35), SRegB3 (0.26), and SRegTM5 (-0.13). All the other observed variables exhibit reasonable loadings to their respective latent variables, ranging from low loading of 0.40 to the high loading of 0.81, which indicate that the observed variables are reflective of the latent variables they purport to measure. The model fit indices of the one-factor models for SRegM, SRegB, SRegTM, and SRegHS generally show values indicative of poor fit. Most of the GFI, AGFI, and PGFI values are lower than the acceptable fit index value of 0.90. The RMR and RMSEA values for these four scales are mostly higher than the acceptable 0.05 threshold that indicates good model fit. Detailed model fit results are illustrated in Table 5.12. The items have been subjected to Rasch analysis to examine the measurement properties of individual items in the self-regulation scales. The item level Rasch analysis provides a further micro level investigation of the scales.

The reliability analysis (for internal consistency) of the scales in SR instrument, results in Cronbach alpha values ranging from 0.62 to 0.83. Time management scale, shows a value of 0.62 that is below the acceptable value of 0.70 for reliability. As mentioned previously, the number of test items, inter-relatedness between items, and dimensionality of the scale can affect the alpha value (Tavakol & Dennick, 2011). Thus, further examination for unidimensionality using item analytic technique based on Rasch model was carried out. This is discussed in the following section. Method, behaviour, and help-seeking scales indicate acceptable alpha values above 0.70 (see Table 5.11).

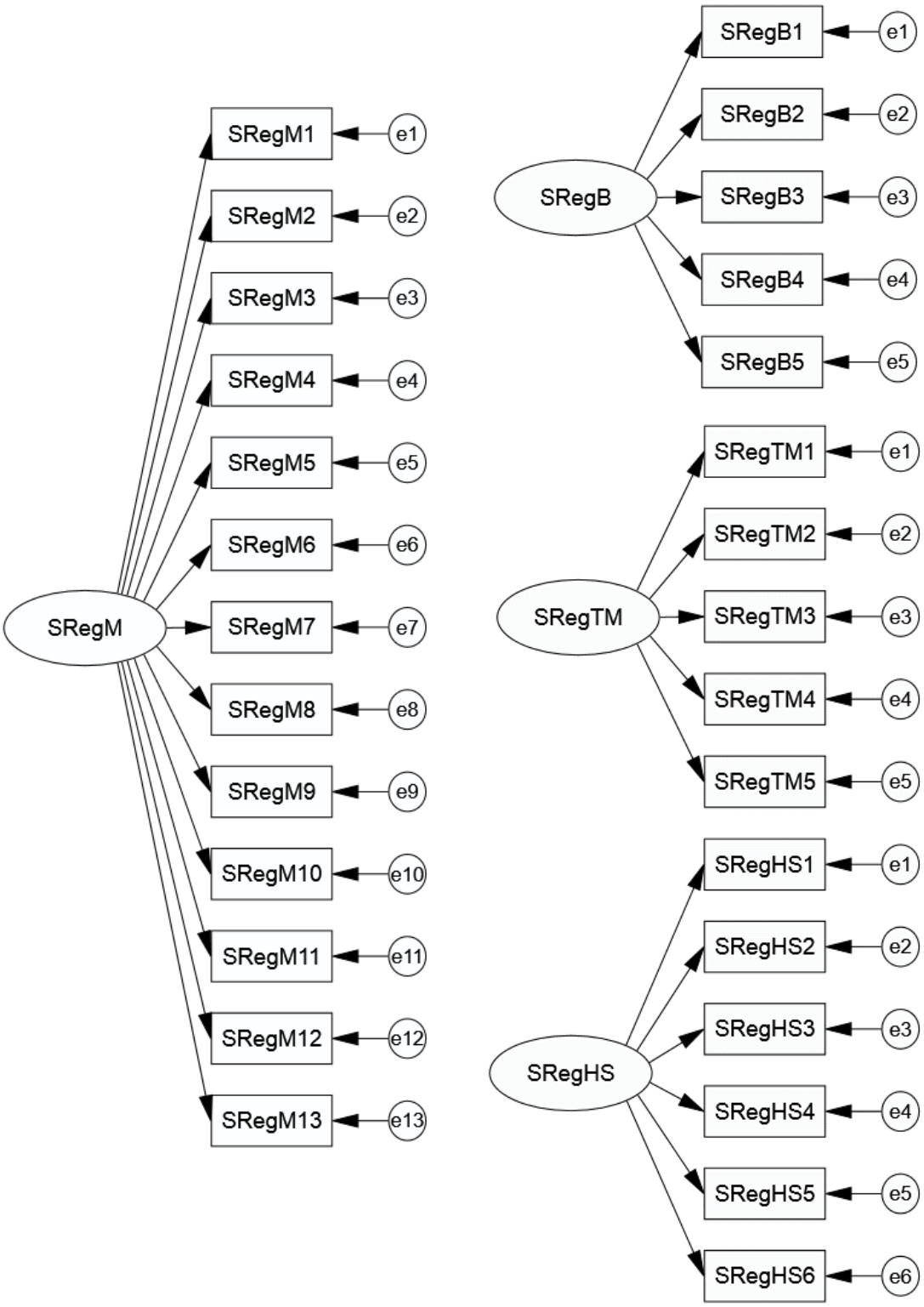


Figure 5.5. The hypothesised model of one-factor CFA (SR instrument).

SRegM – method scale; SRegB – behaviour scale; SRegTM – time management scale; and SRegHS – help seeking scale.

Table 5.11. Factor loadings of one-factor model for latent variables in SR instrument.

	Factor Loadings			
Variables	**SRegM**	**SRegB**	**SRegTM**	**SRegHS**
SRegM1	0.62 (0.05)			
SRegM2	0.66 (0.05)			
SRegM3	0.70 (0.05)			
SRegM4	0.70 (0.05)			
SRegM5	0.62 (0.05)			
SRegM6	0.73 (0.05)			
SRegM7	0.75 (0.05)			
SRegM8	0.68 (0.05)			
SRegM9	0.66 (0.05)			
SRegM10	0.66 (0.05)			
SRegM11	0.09 (0.05)			
SRegM12	0.35 (0.05)			
SRegM13	0.40 (0.05)			
(α = 0.83)				
SRegB1		0.41 (0.03)		
SRegB2		0.45 (0.03)		
SRegB3		0.26 (0.05)		
SRegB4		0.46 (0.03)		
SRegB5		0.55 (0.03)		
(α = 0.70)				
SRegTM1			0.79 (0.05)	
SRegTM2			0.81 (0.05)	
SRegTM3			0.75 (0.05)	
SRegTM4			0.53 (0.05)	
SRegTM5			-0.13 (0.06)	
(α = 0.62)				
SRegHS1				0.73 (0.05)
SRegHS2				0.77 (0.05)
SRegHS3				0.69 (0.05)
SRegHS4				0.57 (0.05)
SRegHS5				0.52 (0.05)
SRegHS6				0.47 (0.05)
(α = 0.74)				

Table 5.12. Model fit indices for latent variables in SR instrument.

	Statistics			
Model Fit Indices	**SRegM**	**SRegB**	**SRegTM**	**SRegHS**
Chi-Square	408.33	35.34	23.56	156.90
df	65	5	5	9
GFI	0.87	0.97	0.98	0.87
AGFI	0.82	0.89	0.93	0.69
PGFI	0.62	0.32	0.33	0.37
RMR	0.07	0.03	0.04	0.09
RMSEA	0.11	0.13	0.01	0.22

5.4.2 SR Instrument: Item Analysis using Rasch Rating Scale Model

The item analysis results suggest that SRegM11 (weighted MNSQ = 1.52, t = 6.8), SRegB3 (weighted MNSQ = 1.50, t = 6.3), and SRegTM5 (weighted MNSQ = 1.78, t = 8.5) are misfitting items. These results are consistent with the CFA results as discussed in the previous section, except for item SRegM12. After further reviews on the statistical results for SRegM12, it was decided that this item would be retained because the item thresholds are in order from low to high and the item discrimination index is 0.43, which is above the minimum cut off value of 0.40 (see Chapter 4 for item thresholds and item discrimination). Although the MNSQ value of SRegM12 (weighted MNSQ = 1.31, t = 4.0) is not within the acceptable threshold range, according to the discrimination index, this item still reasonably discriminates between respondents who were very decisive of their responses and those who had a dilemma. In addition, the item text of SRegM12 (I practise difficult music even if/when I am not asked to do so) is also reviewed. This item appears to reflect students' self-instructed strategies to improve their music playing skills for better performance, which corresponds to the definition of the self-regulation method construct (SRegM) it intends to measure.

The item, SRegM11 (when I find a musical piece is difficult, I give up practising it), may not be relevant to the context of this study. As the participants were preparing for their end of year assessment at the time they responded to this item, it was unlikely that they had a choice to give up practising a difficult musical piece. For SRegB3 (If I cannot play a musical piece *correctly*, I stop to think about how it should sound), the term 'correctly' might be too vague for the participants to understand consistently, and further revision is recommended if this item is to be employed in future research. Finally, it was identified that SRegTM5 (it is easy for me to focus on my music when I am practising alone) is a redundant item. 'Practising alone' is inapplicable for students who require accompanists. Additionally,

it does not necessarily mean that students are not managing their practice session effectively when they have other people present during their practice, as those people can be their audiences and rehearsal could help them to improve their performing skills. The item analysis results for constructs employed in the SR instrument are provided in Table 5.13. The results presented are the final model employed for the SR instrument to reflect the different dimensions of students' self-regulation in this study.

Table 5.13. Item analysis results for constructs in SR instrument.

			Weighted Fit		
Variables	**Estimate**	**Error**	**MNSQ**	**CI**	***t***
SRegM1	-0.30	0.06	0.90	(0.87, 1.13)	-1.6
SRegM2	-0.55	0.06	0.88	(0.87, 1.13)	-1.9
SRegM3	-0.11	0.06	0.98	(0.87, 1.13)	-0.3
SRegM4	0.11	0.05	0.88	(0.87, 1.13)	-1.8
SRegM5	0.01	0.06	1.37	(0.87, 1.13)	5.0
SRegM6	-0.70	0.06	0.77	(0.87, 1.13)	-3.7
SRegM7	-0.62	0.06	0.81	(0.87, 1.13)	-2.9
SRegM8	-0.07	0.06	1.23	(0.87, 1.13)	3.2
SRegM9	0.32	0.05	0.99	(0.87, 1.13)	-0.1
SRegM10	0.24	0.05	0.78	(0.87, 1.13)	-3.5
SRegM12	1.11	0.06	1.31	(0.86, 1.14)	4.0
SRegM13	0.55	0.18	1.18	(0.87, 1.13)	2.6
SRegB1	0.49	0.06	1.01	(0.86, 1.14)	0.2
SRegB2	-0.07	0.07	1.12	(0.86, 1.14)	1.7
SRegB4	-0.11	0.07	0.92	(0.86, 1.14)	-1.2
SRegB5	-0.32	0.11	0.96	(0.86, 1.14)	-0.6
SRegTM1	0.25	0.06	0.90	(0.86, 1.14)	-1.4
SRegTM2	0.37	0.06	0.96	(0.86, 1.14)	-0.5
SRegTM3	0.10	0.06	0.95	(0.86, 1.14)	-0.6
SRegTM4	-0.72	0.10	1.12	(0.85, 1.15)	1.6
SRegHS1	-0.33	0.06	0.97	(0.86, 1.14)	-0.5
SRegHS2	-0.78	0.06	0.77	(0.86, 1.14)	-3.4
SRegHS3	0.22	0.05	0.99	(0.87, 1.13)	-0.2
SRegHS4	0.93	0.05	1.08	(0.87, 1.13)	1.2
SRegHS5	-0.52	0.06	1.06	(0.86, 1.14)	0.8
SRegHS6	0.49	0.12	1.17	(0.87, 1.13)	2.5

5.5 Music Performance Rating Scale (MPRS)

S. Thompson and Williamon's (2003) music performance assessment tool has been adapted to measure students' music performance achievement for this study. There are three assessment criteria included in the MPRS instrument: perceived instrumental competence, musicality, and communications. Each criterion consists of three items. For the purpose of data analysis, each criterion was assigned with a prefix: *IC* for perceived instrumental competence, *M* for musicality, and *C* for communications. The original ten-point response scale used in S. Thompson and Williamon's music performance assessment tool was adapted. In this study, more precise guidelines were provided to describe each item and each category of the response scale. In terms of response scale, 1 and 2 indicate generally inadequate, 3 and 4 indicate minimal competency, 5 and 6 indicate satisfactory, 7 and 8 indicate excellent, and 9 and 10 indicate highly proficient. Table 5.14 provides a summary of the items used in the MPRS instrument. Table 5.15 provides detailed descriptions for each response category.

Table 5.14. Item summary of the MPRS instrument.

Item Code	Item Text
Perceived Instrumental Competence	
IC1	Accuracy: Secure control of notes, tempo, pulse, rhythm, pitch and intonation
IC2	Technical aspects: Fluency of performance and clarity of articulation
IC3	Sound quality: Control of tonal quality, colour and dynamic range
Musicality	
M1	Stylistic accuracy: Understanding the style/genre of the work(s)
M2	Interpretive imagination: Incorporation of musical creativity and individuality
M3	Expressive range: Musical sensitivity including appropriate use of phrasing and expressive dynamic level
Communications	
C1	Deportment on stage: Confident performance and professional appearance
C2	Deportment with instrument: Appropriate posture and demonstration of control over instrument
C3	Audience communication: Demonstration of emotional commitment and conviction that engages the audiences

Table 5.15. Descriptors of the ten-point response scale.

Score	Response Category	Descriptors
1 2	Generally inadequate	Work which is incomplete, displays an inadequate understanding of the subject matter and an inadequate grasp of relevant skills.
3 4	Minimal competency	Work which meets minimal requirements, displays a basic understanding of most of the subject matter and a basic grasp of relevant skills
5 6	Satisfactory	Work of satisfactory quality, which displays a moderate level of understanding of the subject matter and a moderate grasp of relevant skills.
7 8	Excellent	Work of good quality, which demonstrates a thorough knowledge and understanding of the subject matter, proficiency in relevant skills, and analytical and conceptual ability of a higher order.
9 10	Highly proficient	Work of exceptional quality, which demonstrates comprehensive understanding of the subject matter, mastery of relevant skills, sophisticated or original critical and conceptual analysis and interpretation, and outstanding quality in clarity, precision and presentation of work.

5.5.1 MPRS: Confirmatory Factor Analysis

Similarly, CFA has been carried out to examine the structure of the MPRS instrument. Although there were three assessment criteria, the items were originally designed to reflect the single construct of students' music performance achievement. Thus, one-factor CFA was conducted so as to examine the model structure of students' music performance achievement reflected by the nine items (Figure 5.6). The latent variable that represents students' music performance achievement is coded as *Achieve*. The results, presented in Table 5.16, show that all the observed variables load onto the latent variable with relatively high loadings, ranging from 0.88 to 0.94. This indicates that the latent variable is well reflected by the nine items. However, the model fit results (Table 5.17) indicate that MPRS generally has poor model fit as the GFI, AGFI and PGFI values are lower than the acceptable value of 0.90. Additionally, the RMSEA value is 0.25, which is much higher than the acceptable value of 0.05. RMSEA value lower than 0.05 indicates good model fit. Thus, further investigation was carried out to examine the measurement properties of the items at a micro level using Rasch based analysis.

The result of reliability analysis for internal consistency shows that music performance rating scale has an alpha value of 0.98 that is above 0.70 to indicate acceptable reliability (Table 5.16).

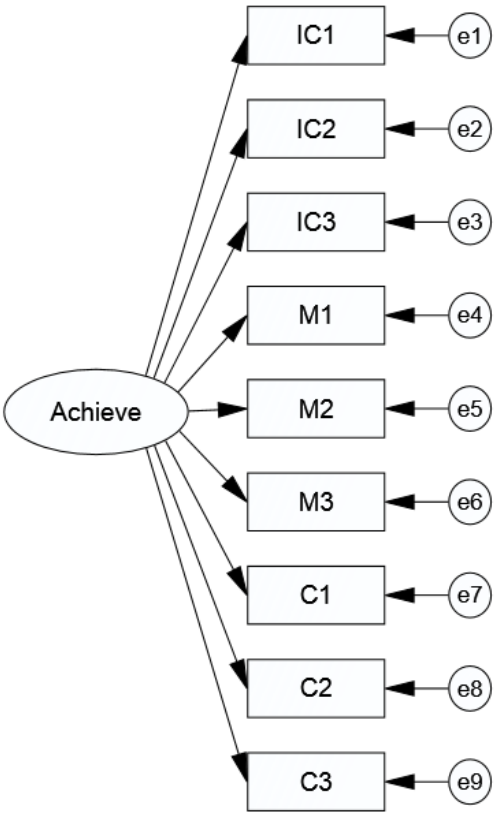


Figure 5.6. The hypothesised model of one-factor CFA (MPRS instrument).
Achieve – music performance achievement; IC – perceived instrumental competent; M – musicality; and C – communications.

Table 5.16. Factor loadings of one-factor model for latent variable in MPRS instrument.

	Factor Loadings
Variables	**Achieve**
IC1	0.88 (0.05)
IC2	0.92 (0.05)
IC3	0.90 (0.05)
M1	0.94 (0.05)
M2	0.94 (0.05)
M3	0.94 (0.05)
C1	0.91 (0.05)
C2	0.92 (0.05)
C3	0.92 (0.05)
(α = 0.88)	

Table 5.17. Model fit indices for latent variable in MPRS instrument.

Model Fit Indices	Statistics Achieve
Chi-Square	426.51
df	27
GFI	0.71
AGFI	0.52
PGFI	0.43
RMR	0.03
RMSEA	0.25

5.5.2 MPRS: Item Analysis using Rasch Rating Scale Model

The nine items in the MPRS instrument have been subjected to item analysis using the Rasch rating scale model. The results, as illustrated in Table 5.18, show that all the items exhibit acceptable weighted MNSQ values, ranging from 0.80 to 1.17. The item analysis results are consistent with the CFA results. Thus, all nine items are retained in the final model to reflect students' music performance achievement.

Table 5.18. Item analysis results for construct in MPRS instrument.

Variables	Estimate	Error	Weighted Fit		
			MNSQ	CI	*t*
IC1	0.14	0.06	1.08	(0.83, 1.17)	0.9
IC2	0.24	0.06	0.83	(0.83, 1.17)	-2.0
IC3	0.54	0.06	1.07	(0.83, 1.17)	0.9
M1	-0.25	0.06	0.80	(0.83, 1.17)	-2.5
M2	0.45	0.06	0.95	(0.83, 1.17)	-0.6
M3	0.39	0.06	1.17	(0.83, 1.17)	1.9
C1	-0.91	0.06	1.06	(0.83, 1.17)	0.7
C2	-0.51	0.06	0.97	(0.83, 1.17)	-0.3
C3	-0.09	0.17	1.04	(0.83, 1.17)	0.4

5.6 The Interview Data

Maintaining systematic and consistent records of the research process is imperative so as to ensure credibility, transferability, dependability, and confirmability of the study. Various templates were created at each stage of the research process, including an interview protocol (see Appendix G, p. 229), transcription, and translation. An example of a transcription template is shown in Table 5.19.

Table 5.19. Example of transcription template.

1	Interviewer	:	So, what got you started learning music?
2	Interviewee	:	Um… Some shows, some sounds of music I mean, and of course my family and uncle…

The number on the left column facilitates the referencing process. The interviewer's dialogue has a blue background fill and the interviewee's dialogue has no colour fill. For transcriptions that required translations, the translation was written below each dialogue. The researcher translated all the transcriptions, because Malaysia is a multilingual country in which a single conversation may draw on several different language varieties, and vocabulary forms and meanings may be very different from those of the standardised, formal language. Due to the researcher's Malaysian background, and having conducted the interviews, the researcher could understand and translate the documents with sufficient knowledge. To further ensure the accuracy of the translations, professionals with a high level of English proficiency were invited to check that the translations were comprehensible. In addition, the translated documents were sent to the interviewees to confirm that the translations conveyed their perspectives adequately. Similarly, transcriptions that did not require translation were also sent to the interviewees to confirm that the interviews were transcribed appropriately.

Additionally, a codebook was created to facilitate the documentation of the themes identified within the interview data. The interview codebook was a document used to record the codes and themes used during data analysis process, setting out their respective definitions and guidelines as to how they were to be used. It served as an important referencing document to ensure consistency and accuracy of the codes applied during data analysis. The codebook template is illustrated in Table 5.20 (for full details of the interview codebook, please see Appendix K, pp. 244-247).

Table 5.20. Example of codebook template.

Code	:	SelCon
Brief definition	:	Self-concept
Full definition	:	Students' self-perception on their ability in general music learning.
When to use	:	This code is used when students mention about their ability in general music learning. This includes their perceptions about how successful they are in music learning, how they think in comparison to others (i.e., peers) and whether music learning is difficult for them.
When not to use	:	Do not use this code when students specifically mention about their ability in relation to music performing skills. Please refer to SelEff.

Each code has its designated label, brief definition, full definition, when to use, and when not to use. Finally, external professionals and/or peers were invited to review the codes developed and the interpretation of the data to minimise personal bias, increase credibility, and produce sound qualitative analysis results.

5.7 Summary

Results of the validation procedures carried out for the quantitative study, and strategies employed to ensure credibility and accuracy of the qualitative study, are described. There are four instruments subjected to validation procedures using statistical procedures based on CFA and Rasch rating scale model:

a) Student motivation to learn instrumental music (SMLIM instrument, four scales)
b) Parental involvement (PI instrument, two scales)
c) Self-regulation (SR instrument, four scales)
d) Music performance rating scale (MPRS instrument, one scale)

Data has been collected from a sample of 375 university music students in Malaysia. One-factor CFA using LISREL 8.80 software is employed so as to examine the factor structure of the scale at the macro level. Rasch rating scale analysis using ConQuest 2.0 software is employed for item level analysis at the micro level to test the unidimensionality of the items.

The first part of the validation procedures involved CFA, which examined how the hypothesised models fit into the data. The CFA results showed that most of the items were reflective of their respective latent constructs based on the factor loading values. However,

the fit statistics generally suggested that the one-factor CFA model fitted poorly to the observed data. No items were removed when CFA was conducted.

Rasch analysis was carried out after CFA to further investigate the measurement properties of individual items in the scales. The unidimensionality of the items to measure a single construct was tested based on Rasch modelling approach, where the data was fitted to the rating scale model. There was a set of criteria used as a guide to whether an item should be removed or retained including weighted MNSQ values, item thresholds, item discrimination, and item statements.

After considering the validation results obtained from CFA and Rasch analyses, the items retained for use in this study for subsequent analyses are as follows:

a) SMLIM instrument
   - Self-concept: SelCon1, SelCon2, SelCon3, SelCon5, SelCon6
   - Self-efficacy: SelEff2, SelEff3, SelEff4, SelEff5, SelEff6
   - Personal interest: PerInt2, PerInt3, PerInt4, PerInt5, PerInt6
   - Perceived values: PerVal1, PerVal2, PerVal3, PerVal4, PerVal5, PerVal6

b) PI instrument
   - Early parental involvement: PInvE1, PInvE2, PInvE3, PInvE4, PInvE5, PInvE6, PInvE7, PInvE8, PInvE9, PInvE10, PInvE11, PInvE12
   - Current parental involvement: PInvC1, PInvC2, PInvC3, PInvC4, PInvC5, PInvC6, PInvC7

c) SR instrument
   - Method: SRegM1, SRegM2, SRegM3, SRegM4, SRegM5, SRegM6, SRegM7, SRegM8, SRegM9, SRegM10, SRegM12, SRegM13
   - Behaviour: SRegB1, SRegB2, SRegB4, SRegB5
   - Time management: SRegTM1, SRegTM2, SRegTM3, SRegTM4
   - Help-seeking behaviour: SRegHS1, SRegHS2, SRegHS3, SRegHS4, SRegHS5, SRegHS6

d) MPRS instrument
   - Achievement: IC1, IC2, IC3, M1, M2, M3, C1, C2, C3.

For the qualitative component of this study, specific strategies have been employed to ensure the data collection and analysis procedures adhered to the requirements of

credibility, transferability, dependability, and confirmability. An audit trail was created to document the research process so as to increase transparency of the study. Systematic procedures were employed to ensure the accuracy of the analysis results, including developing templates for transcribed and translated data, and developing a codebook to facilitate data analysis. Accuracy of the data was further assured through member checking. Individual bias was checked through external and peer review of the coding used, and interpretation of the data.

The validation procedures and the strategies employed in the qualitative component of the study were imperative to ensure quality of the data for subsequent analyses to yield meaningful inferences. The following chapter, Chapter 6, explains the analysis procedures employed.

Chapter 6:
Analytic Techniques and Procedures

6.1 Introduction

This chapter provides detailed descriptions of quantitative and qualitative data preparation and data analysis procedures carried out in this study. Data preparation procedures are imperative to ensure that the data are in appropriate format and accurate for subsequent data analyses. Multiple regression and path analytic techniques are employed to test the hypothesised model. The hypothesised model has been developed based on previous findings and established theoretical framework (see Chapter 2). The thematic analytic technique is used to deepen the understanding of the quantitative findings, and the research topic, through information-rich data.

6.2 Preparation of Collected Data for Analysis

6.2.1 Quantitative Data

The initial data collected from student respondents, and ratings of students' music performance by the examiners, in paper form, were entered into a spreadsheet using Microsoft Excel software. Subsequently, data were transformed into other file formats to suit analysis using SPSS, and into ACSII text file format for data cleaning and analysis using LISREL and ConQuest software. Data cleaning is "the process of inspecting the data for scores (or values) that are outside the accepted range" (Creswell, 2012, p. 181). It is common for there to be typing errors arising from the data entering process (e.g., entering '22' instead of '2'). SPSS software was used to detect typing errors such as out-of-range or misnumbered cases by conducting frequency distribution analysis (Creswell, 2012). After data cleaning, all the scales were subjected to analysis so as to address missing values, scaling procedures, and test for multicollinearity. Details regarding the scales can be found in Chapter 3.

6.2.1.1 Addressing Missing Values

The presence of missing values in psychological research is ubiquitous (Allison, 2009; Little & Rubin, 2015). Missing values can create issues for the estimation of SEM and other statistical methods (Allison, 2003), except if the proportion of missing data is 5% or less (Cheema, 2014). There are several methods developed to handle missing data. The conventional methods include listwise deletion, pairwise deletion and regression imputation. Nevertheless, several researchers (e.g., Allison, 2003; Graham, 2012; Little & Rubin, 2015)

proposed two approaches that have better statistical properties over conventional methods: maximum likelihood (ML) imputation and multiple imputation. They indicate that the conventional methods, especially listwise deletion, which eliminate all the cases that contain missing responses on the observed variables, can reduce the viability of statistical analysis. This is because a large amount of data could be reduced to a significantly small amount during the deletion process. Additionally, Cheema (2014) suggests MI imputation and multiple imputation are more efficient than conventional methods in handling large proportion of missing data of smaller sample size ($n < 1000$).

Despite the disadvantages, Allison (2002) argues that listwise deletion may be more robust than ML imputation and multiple imputation when "the probability of missing data on a particular independent variable depends on the value of that variable (and not the dependent variable)" (p. 7). Furthermore, listwise deletion is particularly useful in handling multiple regression analysis and structural equation modelling, which are the techniques employed in this study (Graham, 2012; Myers, Gamst, & Guarino, 2006). In addition, the ML imputation and multiple imputation methods replace missing values with substitute estimates based on available data, which may be an inappropriate process in relation to the data of this study. During the data collection from examiners of students' music performance ratings, there was a lack of examiner responses due to time constraints. Furthermore, some examiners decided to withdraw from participation in this study. As a result, a considerably large amount of data was missing for music performance ratings. In this case, bias may have been introduced by using imputation methods. A large proportion of missing data (e.g., more than 20%) is also found to affect the performance of multiple imputation (Hardt, Herke, Brian, & Laubach, 2013; Lubin, Colt, Camann, Davis, Cerhan, Severson, Bernstein, & Hartge, 2004; Mishra & Khare, 2014). Cheema (2014) further states in his study that, for the multiple regression analysis method, the effectiveness gained from missing data handling methods between the use of multiple imputation and listwise deletion is only about 1%, when the sample size is small and the proportion of missing data is high (which is the case in this study). Thus, listwise deletion is preferred over the two 'newer' methods in this study.

Listwise deletion was carried out using the built-in deletion feature of the LISREL 8.80 software (Jöreskog & Sörbom, 2006). The complete data set (students' survey responses and their respective music performance rating) in SPSS file format (*.sav) was imported into LISREL and then converted into *.psf format, which was the data file format in LISREL. The listwise deletion was selected by activating the 'define variables' dialog box on the 'data'

menu tab. After selecting the missing value treatment method, the output file was obtained by selecting 'output options' on the 'statistic' menu tab. A new *.psf file which contained no missing values was created and exported to spreadsheet format in Microsoft Excel for subsequent data analysis. The detailed instructions can be found in *LISREL for Windows: PRELIS user's guide* on pages 60 to 62 (du Toit, du Toit, Mels, & Cheng, 2006).

6.2.1.2 Scaling Procedures

As discussed in Chapter 4, misusing raw scores as measures can introduce bias to the analysis process and reduce the overall utility of the inferences made. In addition to the statistical procedures carried out to examine the psychometric properties of the scales, it was necessary to transform the raw scores to measures before proceeding to the final stage of data analysis. According to Salzberger (2010), a measurement model, and Rasch model in particular:

> Tests whether an a priori absolutely scaled raw score represents an a posteriori (that is after having demonstrated that a quantitative latent variable can be inferred from the data) non-linear raw score, which can be transformed into a linear interval-scaled measure of the latent variable. (pp. 1273-1275)

There are several estimation methods that could be employed including Maximum Likelihood Estimate – MLE (Lord, 1980), Bayes Modal Estimation – BME (Mislevy, 1986), Expected A-Posteriori – EAP (Bock, 1983), and Marginal Maximum Likelihood – MML (Bock & Aitkin, 1981). However, Warm (1989) argues that these estimation methods are biased, and proposes his approach of Weighted Likelihood Estimation (WLE) as a better alternative (Linacre, 2007). The WLE method has been used in international large-scale studies (such as PISA) to improve scores estimation, and thus was employed in this study. In light of the advantages of using the Rasch model, ConQuest was used to obtain WLE scores (Wu et al., 2007).

WLE scores were then transformed to W scores (Woodcock & Dahl, 1971). The equation of the W scores is expressed as a direct transformation of the Rasch logit scale (Woodcock, 2012):

$$W = 9.1024 \text{ logits} + 500 \quad (6.1)$$

The equation indicates that 500 is set as the centre point or the average score. According to Woodcock and Dahl (1971, cited in Woodcock, 2012), the W scales provides four advantages:

a) Negative values of the WLE scores are eliminated by setting the centring constant at 500. That is, as shown in the equation above, a value of 500 is added, which transforms any WLE scores that are of negative values to W scores that are expressed in positive values.
b) The need for decimal values in many applications is eliminated by the multiplicative scaling constant of 9.1024.
c) The signs of the item difficulty and person ability scales are set so that low values imply either low item difficulty or low person ability. High values imply either high item difficulty or high person ability.
d) Distances along the W scale have probability implications that are more convenient to remember and to use than distances along the logits scale. (p. 111)

The W scores were computed using the equation above in Microsoft Excel. The resulting data were exported to other file formats required for subsequent analyses.

6.2.1.3 Test for Multicollinearity

Before conducting the final analysis to examine the relationships among variables, it was imperative to test for multicollinearity. Multicollinearity, or simply collinearity, is the statistical term used to describe the problem that arises when two or more independent variables are highly correlated in a multiple regression model (Fabozzi, Focardi, & Rachev, 2014). Fabozzi et al. (2014) indicate that the presence of multicollinearity can increase the standard error of the regression, resulting in a reduced *t* value (which is used for statistical significance test) of many independent variables. The reduced *t* value could produce analysis result of insignificant relationships between variables while the regression model of these variables should, in fact, be highly significant. Investigating the Variation Inflation Factors (VIF) value is one of the ways to diagnose multicollinearity. The VIF analysis involves calculating the regression coefficients to examine the correlation between the independent variable and other independent variables (O'Brien, 2007). Mason (1987) suggests that VIF values exceeding 10 indicate serious multicollinearity. The model should be respecified by removing one or more variables that are highly correlated to reduce the effects of multicollinearity. However, O'Brien (2007) emphasises that the removing process should be done with caution as there may be other factors which affect the results of the VIF analysis. SPSS was used to carry out VIF analysis from which the results exhibited no multicollinearity, and, thus, all the variables were retained in subsequent analyses.

6.2.2 Qualitative Data

Qualitative data were collected through semi-structured student interviews. Flick (2014) highlights that "documentation of data is not merely a technical step in the research process: it also influences the quality of the data that can be used for interpretations" (p. 395). Therefore, rigorous procedures have been carried out to document the qualitative data. Flick (2014) suggests that the process of documenting the qualitative data comprises four steps: (a) recording the data, (b) editing the data (transcription), (c) constructing a 'new' reality in and by the produced text, and, (d) developing a systematic way of data management (p. 385). The researcher incorporated these four essential steps in documenting the interview data in order to ensure the quality of the data. These four steps are explained in further detail in the following section.

The researcher recorded all interviews using a digital audio recorder. An interview protocol was also used to record additional information, such as the time and venue of the interview and interviewee's demographic information. A checklist was also included so as to ensure efficiency and consistency for each interview conducted. Verbatim transcriptions were employed for each of the interviews, and these were saved as separate electronic Microsoft Word files for the ease of data organisation. Non-English transcriptions were translated by the researcher and emailed to the interviewees so as to enable them to check the translated interviews. Other English transcriptions were also emailed to the interviewees to confirm the accuracy of the transcribed interviews. The Microsoft Word files were then exported in to a qualitative data analysis software programme, NVivo. In terms of ethical considerations, the interview data has been anonymised by the use of numbers (i.e., interviewee 1, interviewee 2, and so on). Confidentiality has been taken into account by replacing any universities mentioned with alphabetical letters (i.e., University A) and ensuring the contextual information contained in the transcriptions was not able to identify particular locations.

6.3 Multiple Regression Analysis

Multiple regression is "a general linear modelling approach to analysis of data" used to predict and explain the relationship between the dependent (outcome) and multiple independent variables (predictor) (Schumacker & Lomax, 2016, p. 52). The multiple regression model can be expressed as the following equation:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \ \ldots \ + \beta_p X_{pi} + \varepsilon_i \qquad (6.2)$$

The equation indicates that Y_i, dependent or outcome variable for the ith case is a linear composite of X_{1i}, X_{2i}, … X_{pi}, the independent variables or predictors, and $\mathcal{E}_i$, a residual or error term. β_0 is the constant, and β_1, β_2, … β_p are the regression coefficients associated with the predictors (Azen & Budescu, 2009). Regression analysis was carried out to explore and obtain preliminary results indicative of relationships between the variables examined in this study. Results from the regression analysis were then used to facilitate subsequent path analysis.

According to the conceptual framework (see Chapter 2) used in this study, the variables are divided into five categories: students' level of expertise, students' motivation, home learning environment, self-regulation, and music performance achievement. The aspects and dimensions examined within the context of these five categories are as follows:

a) Students' level of expertise
   - ProgYr (programme year level)
   - InstYr (number of years playing the musical instrument)
   - OthInst (number of other musical instruments known how to play)
   - PracHour (average practice hours per day)
   - QuaGrd (highest music qualification before entering university)
   - PerfExp (performance frequency in the past 10 years)
   - PerfCom (participation in music competition in the past 10 years)

b) Students' motivation
   - SelCon (self-concept)
   - SelEff (self-efficacy)
   - PerInt (personal interest)
   - PerVal (perceived values)

c) Home learning environment
   - FEduc (father's highest level of education)
   - MEduc (mother's highest level of education)
   - Poss (home musical possessions)
   - PBcg (parents' musical background)
   - PInvE (parental involvement during early childhood)
   - PInvC (current parental involvement)

d) Self-regulation
   - SRegM (method: task-oriented learning strategies)

- SRegB (behaviour: orientations toward reflective thinking of own learning)
- SRegTM (time management)
- SRegHS (help seeking behaviour to improve learning)

e) Music performance achievement
- Achieve (music performance ratings).

The statistical analysis carried out as reported in Chapter 5 exhibited the unidimensionality of each variable, thus, the variables specified above were examined independently. These variables were subjected to regression analysis so as to examine their relationships, as follows:

a) Students' level of expertise → student motivation
b) Students' level of expertise → self-regulation
c) Students' level of expertise → music performance achievement
d) Student motivation → self-regulation
e) Student motivation → music performance achievement
f) Self-regulation → music performance achievement
g) Home learning environment → student motivation
h) Home learning environment → self-regulation
i) Home learning environment → music performance achievement.

The '→' indicates the direction of the relationship. For instance, students' level of expertise (independent variable) was hypothesised to predict student motivation (dependent variable).

The regression analysis was conducted using the LISREL software. The regression coefficients (β) were reported to indicate the strength of the relationship and *t* values to indicate statistical significance. When the *t* value is $\geq \pm 2.0$ with p value less than 0.05, the independent variable is predicting the dependent variable significantly. A stepwise regression method was employed so as to eliminate insignificant variables. One insignificant independent variable was eliminated at a time until all the insignificant variables were removed (Fabozzi et al., 2014).

6.4 Path Analysis

Path analysis is an extension of the multiple regression analytic technique which includes several regression equations (Schumacker & Lomax, 2016). It is an analytic approach that is, essentially, a Structural Equation Modelling (SEM) technique. Schumacker and Lomax (2016) further explain that "path models specify the direct, indirect, and

correlated effects among the observed variables in a theoretical model" (p. 69). Thus, path analysis is considered to be a suitable analytic technique to address the research questions, as outlined in Chapter 1. Path analysis is employed to investigate the relationships and interactions among multiple pairs of variables simultaneously as postulated in the theoretical framework.

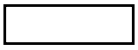
In addition to the function of exploring the relationships among variables, Menard (2010) states that path analysis has gained its popularity due to the following advantages:

a) It provides a graphical representation of a set of algebraic relationships among variables that concisely and visually summarizes those relationships.
b) It allows researchers to not only examine the direct impact of a predictor on a dependent variable, but also see other types of relationships, including indirect and spurious relationships.
c) It indicates, at a glance, which predictors appear to have stronger, weaker, or no relationships with the dependent variable.
d) It allows researchers to decompose or split up the variance in a dependent variable into explained and unexplained, and decompose the explained variance into variance explained by different variables.
e) It allows researchers to decompose the correlation between a predictor and a dependent variable into direct, indirect, and spurious effects. (p. 1019)

However, Menard indicates that path analysis alone is not sufficient in providing evidence of causal relationship, but that temporal order effects must also be taken into account. The temporal order depicts the order of the first event affecting the second event, which in turn, influences the outcome (Gelfand, Mensinger, & Tenhave, 2009). In real life, variables such as attitudes may change over time, resulting in reverse direction of the causal effects. Thus, in future similar research studies, longitudinal and experimental study designs could be considered to address temporal order effects.

Model specification is an important feature in path analysis. This is because path analysis only estimates the effects of the variables based on the model specified by the researcher (Schumacker & Lomax, 2016; P. W. Vaughan, 2007). Model specification typically involves building a model in graphical or equation form, based on an established theoretical framework and previous research. The drawing conventions of path diagrams (graphical form of path model) include:

a)  Latent variable

b)  Observed variable

c) Direction of the causal effects

d)  Correlation between variables

The path model used in this study is grounded in Hallam's (1998) *Model of Instrumental Music Learning*, as discussed in Chapter 2. The preliminary results obtained from the multiple regression analysis were incorporated to build the path models. Following specification of the model, LISREL software was employed to examine the hypothesised relationships among the variables.

LISREL software consists of a 32-bit Windows application that interfaces with PRELIS and LISREL, which are used to carry out path analysis. According to du Toit et al. (2006), PRELIS is an application for "manipulating data, transforming data, generating data, computing moment matrices, computing asymptotic covariance matrices …" and LISREL is an application for "standard and multilevel structural equation modelling" (p. 1). Path analysis using LISREL software involves several steps:

a) Convert data file from Excel format (*.xlsx) or SPSS format (*.sav) into text form and save as *.dat format ready for analysis use with LISREL software.
b) Create a PRELIS2 syntax file (*.pr2) to produce correlation and/or covariance matrices for subsequent path analysis.
c) Create a LISREL syntax file (*.spl) that exhibits the relationships of the variables based on the specified model.
d) Evaluate the results as shown in the LISREL output file (*.out). Similar to the multiple regression analysis, eliminate any insignificant variables and repeat the previous step until only significant variables remain in the model.

The same criteria used for regression analysis were applied to path analysis so as to evaluate the model. The path analysis results were used as the basis for codes and theme development throughout the qualitative analysis.

6.5 Thematic Analysis

Semi-structured interviews were conducted for this study and transcribed into textual data for qualitative analysis. Guest et al. (2012) suggests that one of the common analysis techniques for text type data is word-based analysis that is quantitatively oriented. They indicate that a researcher who uses this technique "evaluates the frequency and co-

occurrence of particular words or phrases in a body of textual data in order to identify key words, repeated ideas, or configuration of words with respect to other words in the text" (Guest et al., 2012, p. 10). However, they argue that this analysis technique may limit the exploration of the complexity and richness of the qualitative data. They then suggest the use of thematic analysis, which moves beyond a numerical approach to words and phrases in interviews, to include descriptions of both implicit and explicit ideas within the data. This helps the researcher to obtain a comprehensive understanding of the phenomena.

A similar concept is also endorsed in an earlier study by Braun and Clarke (2006), who define thematic analysis as:

> A method for identifying, analysing and reporting patterns (themes) within data. It minimally organises and describes your data set in (rich) detail. However, it frequently goes further than this, and interprets various aspects of the research topic. (cited in Flick, 2014, p. 421)

Although the qualitative component of this study was designed to support the quantitative component, it also serves as a mechanism to gain a deeper understanding of the study topic beyond the hypothesised variables and models. Thus, thematic analysis provides a strong basis for analysing the qualitative data collected.

Prior to data analysis, it was imperative to identify an analytic approach (i.e., exploratory, explanatory, confirmatory, or comparative) appropriate within the context of the study. Given the supportive role of the qualitative component to further enrich understanding of the complexity of the phenomena under study, the explanatory approach, which combines both deductive and inductive analytic methods, was employed (Guest et al., 2012). This explanatory method has often been debated in the field of qualitative inquiry, as the term 'explanatory' implies that "the research in question is intended to explain, rather than simply to describe, the phenomena studied", which is quantitative in nature (Maxwell & Mittapalli, 2008, p. 323). However, Maxwell and Mittapalli (2008), citing Miles and Huberman (1994), argue that in the effort of explaining the causal relationships, the qualitative research can create a rather powerful explanation and confirm an established causal model through interpretation and in-depth understanding of the phenomena. They further cite Creswell and Plano Clark (2011) to the effect that the explanatory approach acknowledges the advantage of qualitative investigation in explaining the results of quantitative study. Thus, this approach is particularly well suited to the context of this study.

The development of codes and themes is essential to thematic analysis. Incorporating the constructs identified in the quantitative studies was the main means of developing the codes and themes of this study. Nevertheless, such development was integral to the analysis process so that new perspectives could be discovered and lead to further understanding of the study topic. In the other words, code and theme development, and the coding process, were recursive processes. The codebook was developed in document file format (*.doc) using Microsoft Word. Guest et al. (2012) indicated that the use of a "codebook provides an efficient baseline for moving beyond basic description to an explanatory analysis" (p. 53). NVivo software was used to code the interview data, based on the codes developed and specified in the codebook. After the initial coding had been completed, the researcher reflected on the code application so as to reduce interpretation bias and ensure the codes were applied accurately, according to the definitions as delineated in the codebook. The analysis procedure was followed by seeking the relationships between the codes, comparing the findings with the quantitative results, and linking the themes to the theoretical model.

6.6 Summary

Validation procedures and the employment of various strategies to ensure the quality of the data produced from the research instrument were followed by data analysis procedures. This chapter describes the preparation of the collected data and the techniques employed for analysing the quantitative and qualitative data to answer the research questions.

The quantitative data was cleaned and converted into a file format suitable for subsequent statistical procedures. This includes (a) addressing the missing values using the listwise deletion method, (b) scaling procedures, which transformed raw scores to measures (W scores), and (c) testing for multicollinearity, in order to examine whether there was a high correlation between variables in a regression model which may affect the results of the analysis. SPSS and ConQuest software were employed to carry out these statistical procedures. For qualitative data, the transcribed and translated interview recordings were saved in document format using Microsoft Word. The interview transcriptions were de-identified to ensure the confidentiality of the interviewees. Member checking was conducted so as to ensure the accuracy of the transcriptions. Finally, the transcriptions were transferred to NVivo software for data analysis.

Multiple regression and path analyses were carried out to analyse the quantitative data. A multiple regression analytic technique was employed to provide a preliminary overview of the relationships between the variables examined in this study. Subsequently, path analysis was conducted so as to analyse the correlated effects among the observed variables and thereby address the research questions, as outlined in Chapter 1. Path analysis is particularly appropriate within the context of this study, because it takes into account interactions among multiple pairs of variables simultaneously and provides graphical representation of the relationships. LISREL software was employed to carry out the analyses.

Thematic analysis was conducted to analyse the qualitative data. This is a useful approach that does not only rely on counting recurrence of the identified themes, but also explores and interprets various aspects of the data in detail. The information-rich data helped to deepen and extend the understanding of the quantitative analysis results. NVivo software was employed so as to facilitate the analysis process. A codebook was developed as a way to ensure the codes were applied consistently throughout. The results of the quantitative and qualitative analyses are presented in the following chapter, Chapter 7.

Chapter 7:
Analysis Results

7.1 Introduction

This chapter focuses on reporting the results of the analysis carried out according to the procedures described in Chapter 6. This study aims to examine the factors that affect students' music performance achievement. These factors include students' demographic information, motivation, home learning environment, and self-regulation. Primarily, quantitative analytic techniques have been employed to address the research questions advanced in Chapter 1. However, the importance of the qualitative approach in supporting the quantitative findings, and in the discovery of new factors that may impact students' motivation towards music learning, has also been highlighted. This chapter begins with descriptive information about the participants, followed by results obtained from the different analysis procedures carried out, and concludes with a summary.

7.2 Descriptive Information

7.2.1 Quantitative Data Source

The initial quantitative sample comprised 375 undergraduate music students from seven universities in Malaysia, six of them being government-owned, and one partially government-funded. Table 7.1 provides a tabular representation of the sample's demographic information.

Table 7.1. Summary of quantitative sample distribution.

	Frequency	Percentage
Gender		
Male	157	41.9%
Female	217	57.9%
Missing	1	0.3%
Program		
Music Performance	260	69.3%
Music Education	104	27.7%
Music Composition and Arrangement	9	2.4%
Missing	2	0.5%
Program Year Level		
Year 1	127	33.9%
Year 2	123	32.8%

Year 3	105	28.0%
Year 4	20	5.3%
Principal Instrument		
Keyboard	132	35.2%
Strings	106	28.3%
Woodwinds	36	9.6%
Brass	20	5.3%
Vocal	51	13.6%
Percussions	29	7.7%
Missing	1	0.3%

However, after implementing a listwise deletion technique to address the issue of missing data, the resulting effective sample size was reduced to 81 students from four universities. The resulting dataset was then subjected to scaling procedures and subsequent analyses, as discussed in Chapter 6. Table 7.2 shows the sample's demographic information after missing value treatment.

Table 7.2. Summary of quantitative sample distribution (after addressing missing value).

	Frequency	Percentage
Gender		
Male	34	42.0%
Female	47	58.0%
Program		
Music Performance	41	50.6%
Music Education	40	49.4%
Program Year Level		
Year 1	31	38.3%
Year 2	20	24.7%
Year 3	20	24.7%
Year 4	10	12.3%
Principal Instrument		
Keyboard	26	32.1%
Strings	25	30.9%
Woodwinds	4	4.9%
Brass	5	6.2%
Vocal	14	17.3%
Percussions	7	8.6%

As shown in the table, there are more females than males in the pool of participants in this study. The distribution of music performance and music education students is almost equal. These distributions are to be noted as important, as they could create an advantage in reducing sample representation bias. Nevertheless, it should be noted that although the researcher endeavoured to carry out random sampling, a purposive sampling technique was employed, due to reasons beyond her control, including the bureaucratic processes and the limited number of universities that have music degree program. Thus, the results can only be generalised to the study sample.

7.2.2 Qualitative Data Source

Qualitative data were derived from 19 participants - 12 female and 7 male - from 4 universities. The participants were selected with care using purposive sampling technique, to capture students' perspectives from a diversity of program year levels (year 1, 2, 3, and 4) and musical instrument types (keyboard, strings, woodwinds, vocal, and percussions), as well as ensuring the transferability of the study.

7.3 Results of Multiple Regressions Analysis

Multiple regression analysis was carried out to provide an overview of the relationships between the latent variables or factors. The variables are grouped into five categories, based on the existing literature: students' level of expertise, students' motivation, home learning environment, self-regulation, and music performance achievement. The purpose of the categorisation was to facilitate multiple regression analysis to investigate the relationships between the variables under each category prior to path analysis. For example, regression analysis was carried out to examine whether the variables classified under students' level of expertise (e.g., ProgYr) were predictive of the variables classified under student motivation (e.g., SelCon). The descriptions of the variables under each category can be found in Chapter 6.

The regression analysis was carried out according to the hypothesised relationships between the variables of the model, as developed in Chapter 2:

a) Students' level of expertise → student motivation
b) Students' level of expertise → self-regulation
c) Students' level of expertise → music performance achievement
d) Student motivation → self-regulation

e) Student motivation → music performance achievement
f) Home learning environment → student motivation
g) Home learning environment → self-regulation
h) Home learning environment → music performance achievement.

The results of the analysis of the relationships as exhibited in a, b, and c were used to answer question 1; d and e to answer question 2; and f, g, and h to answer question 3. The results presented in the following sections consist of three figures that explain the predictive power of the variables. The first figure is the regression coefficients indicating the strength of the relationship; the second figure is the error term suggesting unknown disturbance to the relationship that the model is not perfect; and the third figure is the *t* value indicating significance of the relationship. Each regression model follows a general regression equation form as shown below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ ... + \varepsilon \tag{7.1}$$

where the dependent variable (Y) is predicted by single or multiple independent variables (X) plus constant (β_0) and an error ($\mathcal{E}$). The constant is also referred to as the y-intercept. It is the mean value of the dependent variable when all the independent variables are set to zero. The error is the unexplained variance in the regression equation.

Students' level of expertise → student motivation

Regression analysis was carried out to investigate the relationship between students' level of expertise and motivation. Students' level of expertise consisted of the following variables: ProgYr, InstYr, OthInst, PracHour, QuaGrd, PerfExp, and PerfCom. Student motivation is composed of variables including SelCon, SelEff, PerInt, and PerVal. The relationship between each of these variables was subjected to regression analysis. Insignificant relationships were removed using a stepwise method (i.e., the analysis was re-run after each removal). This procedure was repeated until the results only showed significant relationships. The final results are presented in Table 7.3.

Table 7.3. Regression analysis results (regression coefficients, errors and *t* values) of the relationship between students' level of expertise and motivation.

Level of expertise → student motivation		
	SelEff	PerVal
ProgYr	-0.32*	-0.29*
	(0.11)	(0.11)
	-2.96	-2.72

*$p < 0.05$

The significant relationships can be represented in equation forms, as seen below:

$$SelEff = \beta_0 - 0.32ProgYr + error \quad (7.2)$$

$$PerVal = \beta_0 - 0.29ProgYr + error \quad (7.3)$$

The results suggest that only year level (ProgYr) exhibits significant association with students' self-efficacy (SelEff) and perceived value (PerVal) towards music. The negative values of the regression coefficients indicate that the relationships are negatively associated. This suggests that higher program year level is associated with lower degree of self-efficacy and perceived value of music. The results are inconsistent with existing findings, such as those from Papageorgi et al. (2010a), that university music students' self-efficacy improved with age and experience. However, there are other findings that indicated that elementary and secondary school students' self-perceived abilities and subjective task values decreased over time (e.g., Fredricks & Eccles, 2002; McPherson & O'Neill, 2010; McPherson, Osborne, S., Davidson, & Faulkner, 2015). Hallam (2014) hypothesises that students may be becoming more realistic about their aspirations as they progress through their degree program, which could, thus, affect self-perceptions and values of music.

Students' level of expertise → self-regulation

Regression analysis was conducted so as to examine the relationships between students' level of expertise and self-regulation. Students' self-regulation comprises four dimensions, expressed in the following variables: SRegM (method: practicing strategies), SRegB (behaviour: metacognitive learning behaviour), SRegTM (time management: ability to concentrate and plan practice time) and SRegHS (help seeking: help seeking behaviour to improve music performing skills). The analysis yields the following results as shown in Table 7.4.

Table 7.4. Regression analysis results (regression coefficients, errors and *t* values) of the relationship between students' level of expertise and self-regulation.

Level of expertise → self-regulation			
	SRegM	SRegB	SRegTM
PracHour	0.25* (0.10) 2.53		0.24* (0.10) 2.25
QuaGrd		-0.24* (0.11) -2.30	
PerfExp	0.42* (0.10) 4.32	0.31* (0.11) 2.98	-0.33* (0.10) -3.13

*$p < 0.05$

Significant relationships are represented by the following equations:

$$SRegM = \beta_0 + 0.25PracHour + 0.42PerfExp + error \quad (7.4)$$

$$SRegB = \beta_0 - 0.24QuaGrd + 0.31PerfExp + error \quad (7.5)$$

$$SRegTM = \beta_0 + 0.24PracHour - 0.33PerfExp + error \quad (7.6)$$

Equations 7.4 and 7.6 suggest that average practice hours per day (PracHour) and accumulated performance experience (PerfExp) are significant predictors of self-regulation pertinent to practicing strategies used by students (SRegM) and their practicing time management. Equation 7.4 indicates a positive relationship between average practice hours and self-regulation of practicing strategies. Equation 7.6 shows a positive relationship between average practice hours per day and students' time management ability, but a negative relationship between accumulated performance experience and students' time management ability. The reason could be because greater performance experience may attribute to students a higher level of expertise, so that they require less time planning for practice. Equation 7.5 indicates that previous qualification in music (QuaGrd) and accumulated performance experience (PerfExp) are significantly associated with self-regulation pertinent to metacognitive learning processes. In this study sample, when a student has higher performing experience, he or she is more likely to engage in reflective thinking processes and self-evaluate his or her own musical skills during practice. However,

if a student has higher qualifications before entering university, he or she engages less in metacognitive learning processes.

Students' level of expertise → music performance achievement

The relationships between students' level of expertise and music performance achievement were also explored using regression analysis. Examiners rated students' performance using rating scales with specific criteria provided by the researcher, which were to be applied within the context of this study only. The rating scales were designed with care to ensure the set of criteria outlined could be used to assess quality of music performance appropriately (see Chapter 3).

Table 7.5. Regression analysis results (regression coefficients, errors and *t* values) of the relationship between students' level of expertise and music performance achievement.

Level of expertise → achievement	
	Achieve
QuaGrd	0.26*
	(0.11)
	2.39

$p < 0.05$

The significant relationship is transformed into the following equation:

$$Achieve = \beta_0 + 0.26QuaGrd + error \quad (7.7)$$

The results reveal that only the highest qualification in music (e.g., ABRSM Grade 8) before entering university is significantly related to students' music performance achievement. Prior achievement could play a role in the way that it influences students' self-esteem and motivation, which supports their subsequent learning tasks (Hallam, 2009).

Student motivation → self- regulation

According to the conceptual framework used in this study, it was hypothesised that students' motivation may impact their self-regulation. Regression analysis was carried out to explore the postulated relationships. The final results, which show significant relationships, are exhibited in Table 7.6.

Table 7.6. Regression analysis results (regression coefficients, errors and *t* values) of the relationship between students' motivation and self-regulation.

Student motivation → self-regulation				
	SRegM	SRegB	SRegTM	SRegHS
SelCon	-0.27* (0.11) -2.52		0.28* (0.11) 2.54	
SelEff	0.43* (0.12) 3.69	0.28* (0.11) 2.62		
PerInt	0.28* (0.11) 2.59	0.35* (0.11) 3.29		0.32* (0.11) 2.94
PerVal				0.28* (0.11) 2.55

*$p < 0.05$

The results obtained are translated into the following equation form:

$$SRegM = \beta_0 - 0.27SelCon + 0.43SelEff + 0.28PerInt + error \quad (7.8)$$

$$SRegB = \beta_0 + 0.28SelEff + 0.35PerInt + error \quad (7.9)$$

$$SRegTM = \beta_0 + 0.28SelCon + error \quad (7.10)$$

$$SRegHS = \beta_0 + 0.32PerInt + 0.28PerVal + error \quad (7.11)$$

The results show that different dimensions of motivation can impact upon different dimensions of self-regulation. Self-efficacy is found to have a significant positive relationship with self-regulation pertinent to practicing strategies and metacognitive learning processes (equations 7.8 and 7.9). Personal interest is positively associated with self-regulation pertinent to practicing strategies, metacognitive learning processes and help seeking behaviour (equations 7.8, 7.9, and 7.11). The results also show that perceived values of music have significant positive influence on self-regulation pertinent to help-seeking behaviour. For self-concept, the results exhibit a positive relationship, with self-regulation pertinent to time management ability (equation 7.10) and negative relationship with self-regulation pertinent to practicing strategies (equation 7.8). The negative relationship may be because when students have lower self-perceived ability they will tend to engage in more practice using strategies to help them improve their musical skills.

Student motivation → music performance achievement

The relationships between students' motivation and music performance achievement were investigated using regression. The results of the analysis indicate that there are no significant relationships between these variables. An individual can be motivated to achieve a high level of expertise in music performance, however this does not necessarily influence achievement, as music performance involves engagement in various emotions simultaneously and there could be unplanned incidents that require the performer to react spontaneously. Papageorgi (2014) suggests that performance anxiety has evident effects on the quality of music performance.

Self-regulation → music performance achievement

The relationships between students' self-regulation and music performance achievement were also examined using regression analysis. The results yielded from the analysis suggest that there are no significant relationships between self-regulation and music performance achievement. As has been suggested for motivation and achievement immediately above, although a student may devote a great amount of effort and thought into their practice, performance anxiety could be the key influence on achievement.

Home learning environment → student motivation

Regression analysis was employed to explore the effects of various home environmental factors on students' motivation. The home factors include FEduc (father's highest level of education), MEduc (mother's highest level of education), Poss (home musical possessions), PBcg (parents' musical background), PInvE (parental involvement during early childhood) and PInvC (current parental involvement). The results, consisting of regression coefficients, errors, and *t* values, are presented in Table 7.7.

Table 7.7. Regression analysis results (regression coefficients, errors and *t* values) of the relationship between students' home learning environment and motivation.

Home learning environment → student motivation		
	SelEff	PerInt
FEduc	-0.41* (0.10) -4.00	-0.36* (0.11) -3.43
PInvE	0.25* (0.10) 2.38	

*$p < 0.05$

The significant relationships are composed into the following equation form:

$$SelEff = \beta_0 - 0.41FEduc + 0.25PInvE + error \quad (7.12)$$

$$PerInt = \beta_0 - 0.36FEduc + error \quad (7.13)$$

As indicated in equation 7.12, parental involvement during early childhood has a positive impact on students' self-efficacy. Equation 7.12 and 7.13 show that father's education level has a negative relationship with students' self-efficacy and personal interest. This means that students tend to have lower self-efficacy and interest in music when their fathers have higher levels of education. This is an interesting finding because parents with higher education levels usually have higher expectations of their children, which can lead to positive motivation and learning outcomes as reported in large-scale studies such as TIMSS and PISA. However, TIMSS and PISA focus on reading, science, and mathematics subjects. Thus, it could be different in the context of music as a subject. In addition, this study was conducted in Malaysia, in which cultural differences could be a contributing factor to this result.

Home learning environment → self-regulation

The relationships between home factors and students' self-regulation were also examined using regression analysis. Table 7.8 shows the final results, which illustrate the significant relationships.

Table 7.8. Regression analysis results (regression coefficients, errors and *t* values) of the relationship between students' home learning environment and self-regulation.

Home learning environment → self-regulation			
	SRegM	SRegB	SRegHS
FEduc	-0.38* (0.11) -3.60	-0.28* (0.11) -2.49	-0.37* (0.11) -3.52
Poss	0.23* (0.11) 2.05		
PBcg	-0.23* (0.11) 2.24		
PInvC	0.25* (0.11) 2.24		

*$p < 0.05$

The significant relationships are represented in equation form as follow:

$$SRegM = \beta_0 - 0.38FEduc + 0.23Poss - 0.23PBcg + 0.25PInvC + error \quad (7.14)$$

$$SRegB = \beta_0 - 0.28FEduc + error \quad (7.15)$$

$$SRegHS = \beta_0 - 0.37FEduc + error \quad (7.16)$$

As with the previous findings related to students' motivation in this study, father's education level also has a negative relationship with students' self-regulation pertinent to practicing strategies, metacognitive learning process and help seeking behaviour (equation 7.14, 7.15, and 7.16). Interestingly, it is found that parents' musical background is negatively associated with students' self-regulation (equation 7.14). In the other words, students' self-regulation is lower when parents have a more established background in music. Perhaps, such students have developed a range of musical skills, as their parents' musical background would most likely result in them being engaged in more musical activities from the time they were young. Their self-regulatory practices may therefore have become automatic and taken-for-granted, and may have resulted in less reported self-conscious engagement in the use of practising strategies. Equation 7.14 indicates that home musical possessions and current parental involvement have a positive impact on students' self-regulation pertinent to their use of practicing strategies.

Home learning environment → music performance achievement

The regression analysis carried out suggests that there is no significant relationship between the home learning environment and students' music performance achievement. Home factors may not affect students' achievement directly, but could have indirect effects through their musical and motivation development (Creech, 2009; Davidson et al., 1996; Zdzinski, 2011).

The results yielded from multiple regressions analysis were implemented in the subsequent analysis to construct a path model to further explore the direct and indirect interactions of the variables.

7.4 Results of Path Analysis

The path analysis was carried out to confirm the relationships found using regression analysis, and to seek answers for all the research questions of the study. Multiple regression analysis provided a preliminary overview of the relationships between the variables. Path analysis was necessary to further examine the interactions of these variables based on the theoretical model as advanced in Chapter 2. Path analysis can examine the effect of a mediating variable, in addition to investigation of the direct effects between independent and dependent variables using multiple regression analysis.

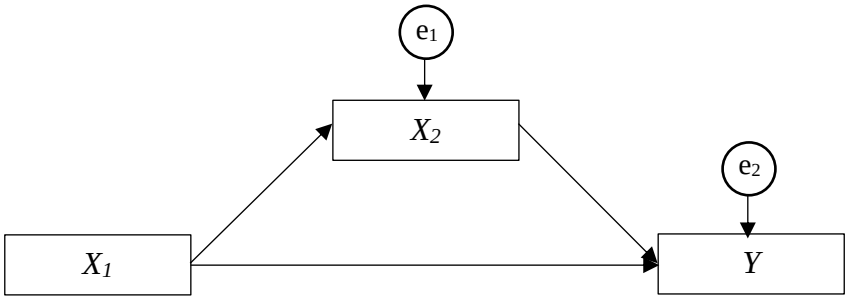


Figure 7.1. Example of a simple path diagram.

A path diagram (such as the one in Figure 7.1) is drawn to illustrate the hypothesised relationships among the variables and to present the results in graphical form. In Figure 7.1, X_1 has direct and indirect effects on Y. The path that is drawn from X_1 to Y through X_2 indicates that X_1 influences X_2, which in turn influences Y. In this case, X_2 serves as a mediator between X_1 and Y, and hence, X_1 influences Y indirectly. The path that is drawn directly from X_1 to Y without intervening variable suggests that X_1 has direct influence on Y

(Schumacker & Lomax, 2016). Therefore, path analysis permits better exploration of the hypothesised variable interactions.

Path coefficients (β), or standardised regression coefficients are the values computed to depict the magnitude and significance of the relationships between the variables. According to Schumacker and Lomax's (2016) explanation, path coefficients are different from regression coefficients computed in multiple regression analysis:

> In multiple regression, a dependent variable is regressed in a single analysis on all of the independent variables. In path analysis, one or more multiple regression equations are analysed depending on the variable relations specified in the path model. Path coefficients are therefore computed only on the basis of the particular set of independent variables that lead to the dependent variable under consideration. (p. 73)

The path coefficients can range from -1.00 to +1.00 with greater values indicating stronger relationships; the signs + and - indicate whether an independent variable results in a predicted increase (+) or decrease (-) in a dependent variable (P. W. Vaughan, 2007).

The path model of this study was constructed based on the theoretical model developed by Hallam (1998), incorporating the results obtained from previous multiple regression analyses. The model consists of 19 variables reflecting five dimensions, as shown in Table 7.9. Detailed information about the variables can be found in the codebook as attached in Appendix I (pp. 231-240).

Table 7.9. Summary of the variables used in the path model.

Variable Label	Description
Level of Expertise	
ProgYr	Program year level
PracHour	Average practice hours per day
QuaGrd	Highest qualification in music before entering university
PerfExp	Performance frequency in the past 10 years
Student Motivation towards Learning Instrumental Music	
SelCon	Self-concept
SelEff	Self-efficacy
PerInt	Personal interest
PerVal	Perceived Values
Home Learning Environment	
FEduc	Father's highest level of education
MEduc	Mother's highest level of education

Poss	Home musical item possessions
PBcg	Parents' musical background
PInvE	Parental involvement during early childhood
PInvC	Current parental involvement
Self-Regulation	
SRegM	Method: practicing strategies
SRegB	Behaviour: metacognitive learning behaviour
SRegTM	Time management: ability to concentrate and plan practice time
SRegHS	Help-seeking: help seeking behaviour to improve music performing skills
Learning Outcome	
Achieve	Music performance achievement

The relationships between these variables are constructed into a path model according to the model of instrumental music learning as shown in Figure 7.2.

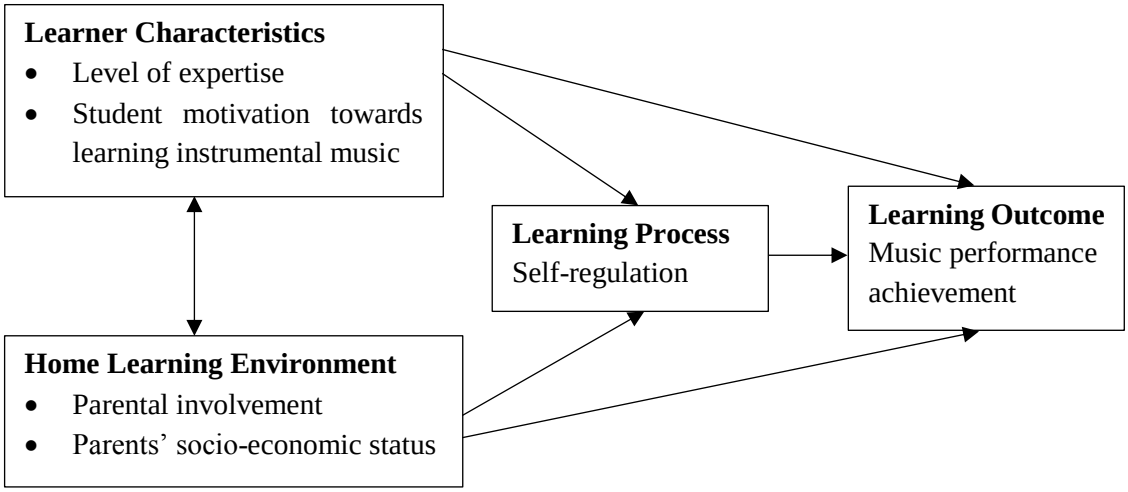


Figure 7.2. Model of instrumental music learning.

LISREL software was employed to carry out path analysis (see Chapter 6 for detailed descriptions of the path analysis procedures). The final results, which show significant relationships are presented in equation form, and in graphical form using IBM AMOS 21.0 software to draw the path diagram as shown in Figure 7.3. The subsequent sections report and discuss the final results with respect to the equations and the path diagram.

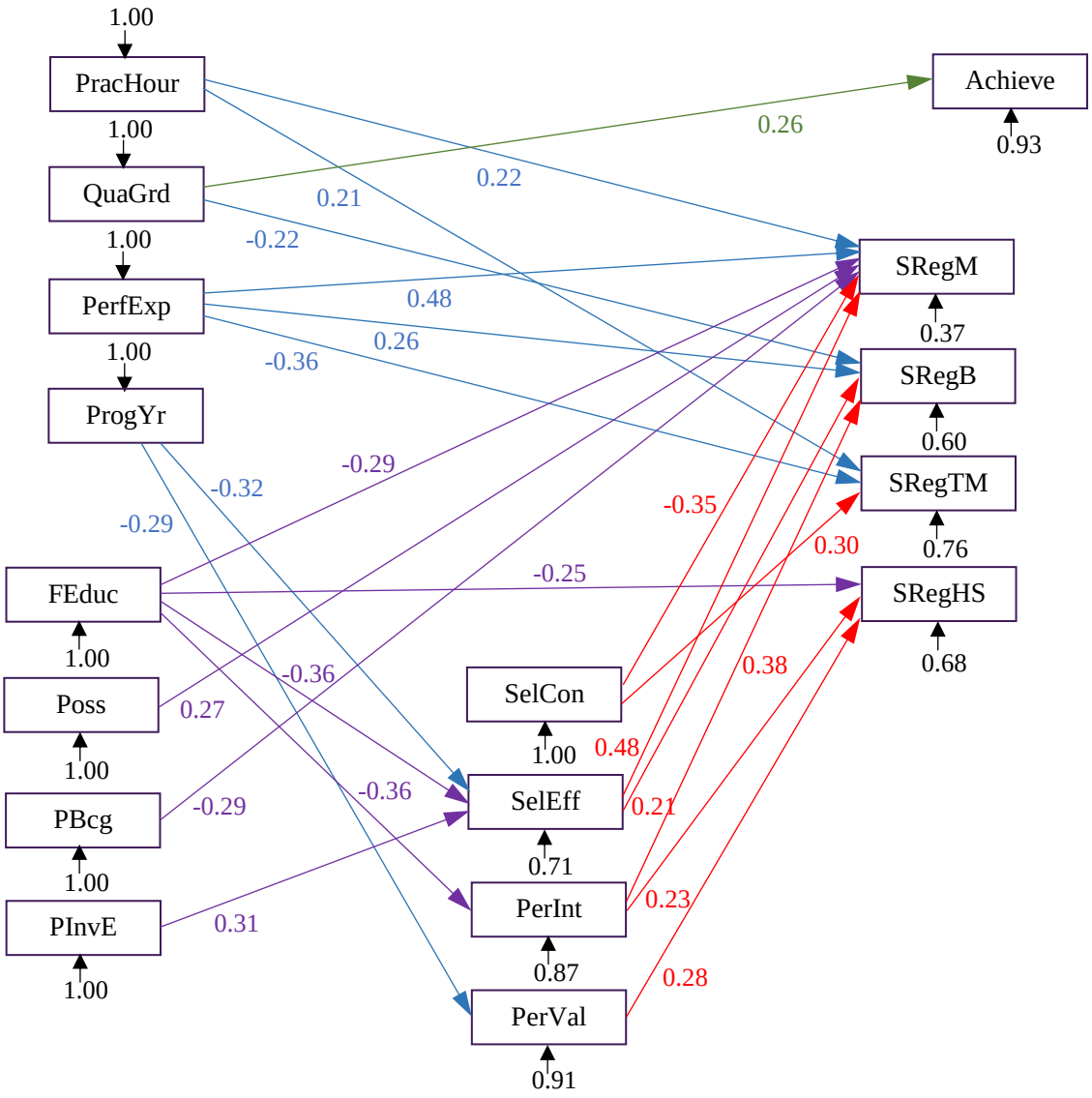


Figure 7.3. Final results of the path diagram showing the interactions among the personal-environmental factors influencing students' music performance achievement.

Note. To facilitate the interpretation of the path diagram, different coloured arrows are used: (a) a blue arrow (→) indicates causal effects predicted by variables from students' level of expertise; (b) a purple arrow (→) indicates causal effects predicted by variables from home learning environment; (c) a red arrow (→) indicates causal effects predicted by variables from student motivation towards learning instrumental music; and (d) a green arrow (→) indicates variables that have effects on students' music performance achievement.

7.4.1 Direct Effects

7.4.1.1 Direct Effects on Student Motivation towards Instrumental Music Learning

There are three factors that appear to influence the different aspects of students' motivation (self-efficacy, personal interest, and perceived values). One of the influencing factors is classified under the category of students' level of expertise, and the other two influencing factors are home environmental factors. The following sections discuss the results in further detail.

$$SelEff = \beta_0 - 0.32ProgYr - 0.36FEduc + 0.31PInvE + error \quad (7.17)$$

$$PerInt = \beta_0 - 0.36FEduc + error \quad (7.18)$$

$$PerVal = \beta_0 - 0.29ProgYr + error \quad (7.19)$$

Effects of student level of expertise

Based on the results as shown (equation 7.17 and 7.19), year level (ProgYr) appears to have negative impact on students' self-efficacy (ProgYr→SelEff, β = -0.32, t = -3.10 at $p < 0.05$) and perceived values (ProgYr→PerVal, β = -0.29, t = -2.58 at $p < 0.05$). In the other words, higher year level students seem to have lower self-efficacy and perceived values of music. These negative relationships are inconsistent with the existing findings that higher year level students have higher self-perceived ability and task values within the university context, as discussed in the regression analysis results section (see pp. 145-146). Despite the fact that students may become increasingly aware of, and realistic about, their own capabilities when they approach the final years of university (Hallam, 2014), which may deflate their self-efficacy, the lack of recognition for music in Malaysia (Ministry of Higher Education Malaysia, 2010) could limit job opportunities, as a result of which the perceived value of music is likely to decrease.

Effects of home learning environment

As shown in equation 7.17 and 7.18, and Figure 7.3, father's education level (FEduc) appears to have negative effect on students' self-efficacy (FEduc→SelEff, β = -0.36, t = -3.55 at $p < 0.05$) and personal interest (FEduc→PerInt, β = -0.36, t = -3.28 at $p < 0.05$). These results are also inconsistent with the existing literature that suggests parental role is crucial in supporting students' development of self-belief and interest in music (e.g., Buchmann, 2002; Dahl & Lochner, 2012; Davidson & Burland, 2006; Davidson et al., 1996; McClellan, 2011; Mullis et al., 2012; OECD, 2013b; Zdzinski, 2011). The extant literature indicates that parents with higher education levels generally have positive attitudes towards,

and have higher expectations of, educational achievement that may transfer to their children. However, it appears that this is not the case in this study. Cultural difference could be one of the contributing factors to this result, as music is not valued equally across cultures (Hallam, 2009). If the status of music lacks recognition in Malaysia, as mentioned, it is possible that fathers who finished education at higher levels (e.g., Masters, PhD) may prefer their children to focus on mainstream subjects such as medicine and engineering, which are believed to have better job prospects. The findings of McClellan's (2011) study suggest that parents' personal interest, attention, and support for their children's participation in musical activities are important in the development of musical self-concept. Additionally, parents' confidence in their children's musical ability contributes to the development of students' self-concept as a future music educator (McClellan, 2011). Thus, students' musical self-efficacy and personal interest could decrease when they are not supported by their parents. Nonetheless, parental involvement is shown to have positive impact on students' self-efficacy (PInvE→SelEff, $\beta = 0.31$, $t = 3.02$, $p < 0.05$) (equation 7.17). This result is generally consistent with the current findings (e.g., Borkowski, Ramey, & Bristol-Power, 2002; Cheung & Pomerantz, 2012; Fan & Williams, 2010; Sichivitsa, 2007).

7.4.1.2 Direct Effects on Self-Regulation

The results indicate that there are 10 factors that could affect students' self-regulation, pertinent to four different dimensions of method, behaviour, time management, and help-seeking behaviour. The significant relationships are presented in the equations below and in Figure 7.3.

$$SRegM = \beta_0 + 0.22PracHour + 0.48PerExp - 0.35SelCon + 0.48SelEff - 0.29FEduc - 0.29PBcg + 0.27Poss + error \quad (7.20)$$

$$SRegB = \beta_0 + 0.26PerfExp - 0.22QuaGrd + 0.21SelEff + 0.38PerInt + error \quad (7.21)$$

$$SRegTM = \beta_0 + 0.21PracHour - 0.36PerExp + 0.30SelCon + error \quad (7.22)$$

$$SRegHS = \beta_0 + 0.23PerInt + 0.28PerVal - 0.25FEduc + error \quad (7.23)$$

Effects of students' level of expertise

There are three factors from the dimension of students' level of expertise that have direct effects on their self-regulation. It is found that average practice hours per day (PracHour) has a positive effect on students' self-regulation related to the use of effective practicing strategies (PracHour→SRegM, $\beta = 0.22$, $t = 3.01$ at $p < 0.05$) and time

management ability (PracHour→SRegTM, β = 0.21, t = 2.04 at $p < 0.05$). In the context of advanced instrumental music learning at the university level, students are expected to adopt effective practicing strategies and manage their practice time in order to improve their performance skills (Clark et al., 2014; Jørgensen & Hallam, 2009; Lehmann & Jørgensen, 2012). It is also evident that accumulated practice hours are required to acquire a higher level of expertise (e.g., Ericsson, Krampe, & Tesch-Römer, 1993; Jabusch, Alpers, Kopiez, Vauth, & Altenmüller, 2009; Jørgensen, 2002). In addition, it may be inferred that students who engage in longer hours of practice tend to improve their performance skills. This explains the positive relationships between practice hours and students' self-regulation.

The results also suggest that accrued performing experience (PerfExp) has a positive influence on students' self-regulation, in terms of the use of practicing strategies (PerfExp→SRegM, β = 0.48, t = 6.11 at $p < 0.05$) and metacognitive learning processes (PerfExp→SRegB, β = 0.26, t = 2.82 at $p < 0.05$), but negatively influences their time management ability (PerfExp→SRegTM, β = -0.36, t = -3.46 at $p < 0.05$). The process of developing expertise in music spans many years (Papageorgi, 2014). Thus, the accumulated performance experience over years may develop autonomous learners who use effective practicing strategies and engage in metacognitive learning based on the knowledge and experience acquired. However, the negative relationship between performance experience and time management ability may be because students have already acquired a certain level of expertise through their previous experiences, and that, as a result, less time planning for practice is needed. As indicated by Hallam (1998), practising effectively, rather than the mere accumulation of practice time, could be considered the ultimate contributor to successful performance. Nevertheless, the study of the significance of cumulative performance experiences on students' self-regulation remains under explored in the field of music education, and further investigation is needed to confirm the current findings.

Finally, the results show that students' previous highest qualification in music (QuaGrd) has a negative effect on self-regulation pertinent to their use of metacognitive thinking skills (QuaGrd→SRegB, β = -0.22, t = -2.41 at $p < 0.05$). There appears to be a lack of research regarding the effects of prior achievement on students' self-regulation in the music education field. This could be because a student with lower grades tends to self-evaluate his/her own practice processes more frequently in order to improve performance skills. It is also important to note that students with a high level of expertise in performance

may not have taken any graded examinations prior to entering university. Thus, further research is required to address this concern.

Effects of home learning environment

As shown in equation 7.20 and Figure 7.3, the variable, home musical possession, (Poss→SRegM, β = 0.27, t = 3.42 at $p < 0.05$) appears to have a positive effect on students' self-regulation in adopting appropriate practicing strategies. This result is consistent with previous findings that home environment has an important impact on children's musical development, although the existing findings are not explicitly linked to students' self-regulation in music (e.g., Brand, 1986; Custodero & Johnson-Green, 2003; Howe & Sloboda, 1991; Wills, 2011). In contrast, parents' musical background (PBcg→SRegM, β = -0.29, t = -3.70 at $p < 0.05$) and father's education level (FEduc→SRegM, β = -0.29, t = -3.50 at $p < 0.05$) seem to have a negative influence on students' self-regulation pertinent to practicing strategies used. Father's education level (FEduc→SRegTM, β = -0.25, t = -2.34 at $p < 0.05$) also appears to have a negative effect on students' help-seeking behaviour to improve music performing skills. These results are inconsistent with findings of existing studies that parents have important roles in providing positive musical experiences for their children (e.g., Custodero & Johnson-Green, 2003; Davies-Kean, 2005; Howe & Sloboda, 1991; McClellan, 2011). As we have discussed above, differences in culture and context could possibly contribute to these results (see p. 151-152). However, empirical studies that specifically investigate the relationships between home factors and students' self-regulation remain limited. Thus, more research should be conducted on this question.

Effects of student motivation

Each aspect of students' motivation has an impact on different dimensions of their self-regulation. According to the results, as shown from equations 7.20 to 7.23, and Figure 7.3, the method dimension (learning/practicing strategies) of self-regulation (SRegM) is influenced by students' self-concept (SelCon→SRegM, β = -0.35, t = -4.65 at $p < 0.05$) and self-efficacy (SelEff→SRegM, β = 0.48, t = 6.17 at $p < 0.05$); the behaviour dimension (metacognitive learning skill) (SRegB) has a positive relationship with students' self-efficacy (SelEff→SRegB, β = 0.21, t = 2.20 at $p < 0.05$) and personal interest (PerInt→SRegB, β = 0.38, t = 4.09 at $p < 0.05$); the time management dimension is affected by students' self-concept (SelCon→SRegTM, β = 0.30, t = 2.90 at $p < 0.05$); and the help-seeking behaviour dimension is influenced by students' personal interest (PerInt→SRegHS,

β = 0.23, t = 2.22 at $p < 0.05$) and perceived values of music (PerVal→SRegHS, β = 0.28, t = 2.88 at $p < 0.05$).

The results are consistent with the existing findings, and theoretical assumptions, that motivation has an important association with students' increased self-regulation (e.g., Austin et al., 2006; McPherson & McCormick, 2006; Nielsen, 2010; Renwick & Reeve, 2012), except for the negative relationship between self-concept and the method dimension of self-regulation. This exception is in contrast to the positive relationship between self-efficacy and the method dimension of self-regulation. The contrasting result confirms Bong and Clark's (1999) conclusion that self-concept and self-efficacy have different predictive and explanatory power in relation to students' behavioural intentions. Self-efficacy is related to students' views/expectations of themselves that are constructed through their conscious reflection and is specific to the task assigned to them. This explains the positive relationship between self-efficacy and self-regulation. Self-concept is students' reflection of themselves based on comparison of themselves to other students. Thus, when students feel that their ability is lower compared to other students, there might be an increase in their self-regulation, so as to improve their musical skills.

7.4.1.3 Direct Effects on Music Performance Achievement

It was hypothesised that students' level of expertise, motivation, and self-regulation would have direct effects on music performance achievement. However, the results as exhibited in the equation below, and Figure 7.3, suggest that only the highest qualification in music prior to entering university has a direct impact on music performance achievement (QuaGrd→Achieve, β = 0.26, t = 2.27 at $p < 0.05$)

$$Achieve = \beta_0 + 0.26QuaGrd + error \quad (7.24)$$

The effects of prior achievement on students' current achievement are evident in research in other field such as science and mathematics (e.g., Guo et al., 2015; Hemmings, Grootenboer, & Kay, 2011; M. O. Martin et al., 2008; OECD, 2013c). In the music field, the number of research studies remains limited. Nonetheless, prior achievement has an important impact on students' motivation and self-esteem to engage in subsequent learning (Hallam, 2009). Thus, there is a need for more research to investigate the relationships between prior achievement and current achievement in the field of music.

7.4.2 Indirect Effects

7.4.2.1 Indirect Effects on Self-Regulation

An indirect effect occurs when the effect of one variable on another variable is intervened by one or more mediating variables (as explained at the beginning of this section, p. 154). The indirect effect is calculated by multiplying the path coefficients (Schumacker & Lomax, 2016). For example, the indirect effect of X_1 on Y through X_2 is equal to multiplying the path coefficients of β_2 and β_3.

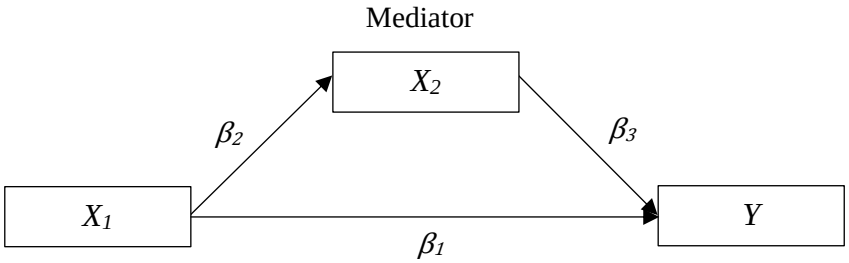


Figure 7.4. Example of a path diagram with indirect effect.

The result yielded from the multiplication is the path coefficient that describes the indirect effect. Kenny (2016) suggests that for indirect effect, 0.01 indicates a small effect, 0.09 indicates a medium effect, and 0.25 indicates a large effect. As illustrated in the path diagram (Figure 7.3), students' motivation has mediating effects between students' level of expertise and self-regulation, and between home factors and self-regulation. The results of the indirect effects are presented and discussed in the following sections.

Indirect effects of students' level of expertise mediated by student motivation

The path diagram shows that program year level (ProgYr) has an indirect influence on three dimensions of self-regulation – method (SRegM), behaviour (SRegB), and help-seeking behaviour (SregHS) – through student motivation. The calculations of the indirect effects are shown in the following equation 7.25, 7.26, and 7.27. The subscripts as shown in the equation indicate the paths of the relationships between the variables.

$$Indirect\ Effect_{SRegM} = -0.32_{ProgYr \rightarrow SelEff} * 0.48_{SelEff \rightarrow SRegM} = -0.15 \quad (7.25)$$

$$Indirect\ Effect_{SRegB} = -0.32_{ProgYr \rightarrow SelEff} * 0.21_{SelEff \rightarrow SRegB} = -0.07 \quad (7.26)$$

$$Indirect\ Effect_{SRegHS} = -0.29_{ProgYr \rightarrow PerVal} * 0.28_{PerVal \rightarrow SRegHS} = -0.08 \quad (7.27)$$

As shown in equation 7.25, ProgYr has moderate indirect effects of -0.15 on SRegM through students' self-efficacy (SelEff). The negative result suggests that higher year level could have a negative impact on students' regulated use of practicing strategies. ProgYr also has an indirect negative effect on SRegB of -0.07 through SelEff (equation 7.26). Finally, it is observed that ProgYr has an indirect influence on SRegHS through students' perceived values of music (PerVal). The indirect effect result as multiplied (equation 7.27) indicates that ProgYr has small effects of -0.08 on SRegHS. Combining all the results, through mediating effects, program year level generally has a negative impact on students' self-regulation in terms of method, behaviour, and help-seeking behaviour. Perhaps, the resulting negative impact of program year level on students' self-efficacy and perceived values of music decreases their motivation to purposefully engage in deliberate practice (which is an aspect of the self-regulated learning process). Nevertheless, more studies are needed to investigate the relationship between these two factors.

Indirect effects of home learning environment mediated by student motivation

From Figure 7.3, father's education level (FEduc) and parental involvement during childhood (PInvE), through students' motivation (self-efficacy, personal interest, and perceived values), have indirect effects on different dimensions of self-regulation, including method (SRegM), behaviour (SRegB), and help-seeking behaviour (SRegTM). The calculations of the indirect effects are given below, in equation 7.28 to equation 7.33.

$$Indirect\ Effect_{SRegM} = -0.36_{FEduc \rightarrow SelEff} * 0.48_{SelEff \rightarrow SRegM} = -0.17 \quad (7.28)$$

$$Indirect\ Effect_{SRegB} = -0.36_{FEduc \rightarrow SelEff} * 0.21_{SelEff \rightarrow SRegB} = -0.08 \quad (7.29)$$

$$Indirect\ Effect_{SRegB} = -0.36_{FEduc \rightarrow PerInt} * 0.38_{PerInt \rightarrow SRegB} = -0.14 \quad (7.30)$$

$$Indirect\ Effect_{SRegHS} = -0.36_{FEduc \rightarrow PerInt} * 0.23_{PerInt \rightarrow SRegHS} = -0.08 \quad (7.31)$$

FEduc, through students' self-efficacy (SelEff), has negative influences on SRegM (-0.17, equation 7.28) and SRegB (-0.08, equation 7.29). Furthermore, FEduc also has negative influences on SRegB (-0.14, equation 7.30) and SRegHS (-0.08, equation 7.31) through students' personal interest (PerInt). To summarise, higher father's education level, combining these effects, results in lower self-regulation specific to practicing strategies, metacognitive learning, and help-seeking behaviour. The negative impact that is inconsistent with existing studies could be because of the different parenting style and cultural values of music in Malaysia as discussed previously.

$$Indirect\ Effect_{SRegM} = 0.31_{PInvE \rightarrow SelEff} * 0.48_{SelEff \rightarrow SRegM} = 0.15 \quad (7.32)$$

$$Indirect\ Effect_{SRegB} = 0.31_{PInvE \rightarrow SelEff} * 0.21_{SelEff \rightarrow SRegB} = 0.07 \quad (7.33)$$

Despite FEduc, parental involvement in students' musical development during early childhood (PInvE) has indirect effects on their self-regulation (SRegM and SRegB) through self-efficacy. The indirect paths, through SelEff, suggest that PInvE has a moderate effect on SRegM (0.15, equation 7.32) and a small effect on SRegB (0.07, equation 7.33). To summarize the indirect effects, then, parents' higher level of involvement in students' musical development processes during early childhood increases their self-regulation in using effective practicing strategies and engaging in metacognitive learning processes.

7.4.3 Total Effects

Total effects are the sum of the direct and indirect effects that connect a predictor (exogenous variable) to an outcome (endogenous variable) (Cudeck & du Toit, 2009). An exogenous variable is a solely independent variable that does not get affected by any other variables in the model. An endogenous variable is a variable that is solely explained by the relationships and functions of other variables in the model. Figure 7.5 diagrams this concept of total effects.

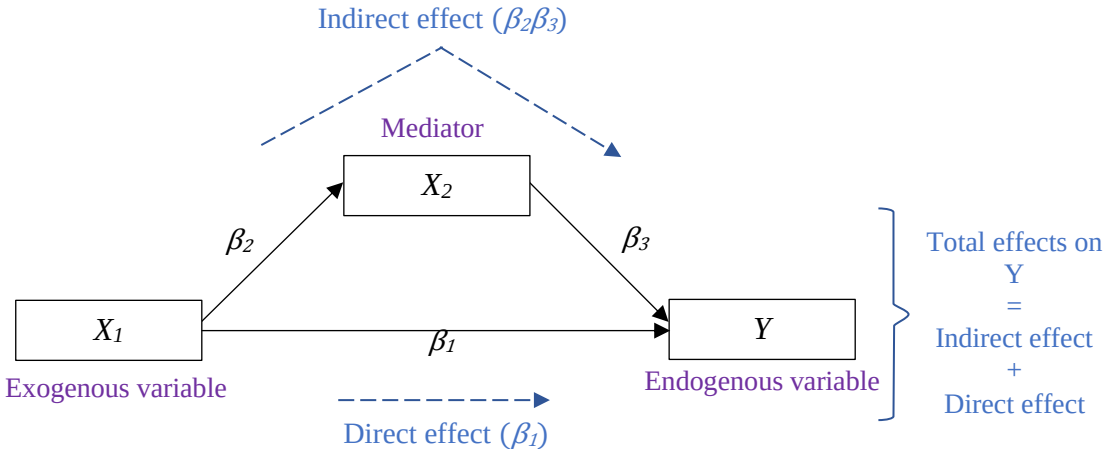


Figure 7.5. Example of a path diagram with total effects.

The causal effects of the path model shown in Figure 7.3 are presented in Table 7.10. This table provides a comprehensive overview of the causal effects of the independent variables (predictor) on the dependent variables (outcome variable). The total effects, in particular, take into account both direct and indirect effects to explain the relationships between the independent and dependent variables.

Table 7.10. Summary of causal effects for path model shown in Figure 7.3.

Dependent Variable	Independent Variable	Causal Effects		
		Direct	Indirect	Total
SelEff (R^2 = 0.29)	ProgYr	-0.32*	-	-0.32+
	FEduc	-0.36*	-	-0.36+
	PInvE	0.31*	-	0.31+
PerInt (R^2 = 0.13)	FEduc	-0.36*	-	-0.36+
PerVal (R^2 = 0.09)	ProgYr	-0.29*	-	-0.29+
SRegM (R^2 = 0.48)	ProgYr	-	-0.15	-0.15+
	PracHour	0.22*	-	0.22+
	PerfExp	0.48*	-	0.48+
	FEduc	-0.29*	-0.17	-0.46+
	Poss	0.27*	-	0.27+
	PBcg	-0.29*	-	-0.29+
	PInvE	-	0.15	0.15+
	SelCon	-0.35*	-	-0.35+
	SelEff	0.48*	-	0.48+
SRegB (R^2 = 0.17)	ProgYr	-	-0.07	-0.07+
	QuaGrd	-0.22*	-	-0.22+
	PerfExp	0.26*	-	0.26+
	FEduc	-	-0.22	-0.22+
	PInvE	-	0.07	0.07+
	SelEff	0.21*	-	0.21+
	PerInt	0.38*	-	0.38+
SRegTM (R^2 = 0.24)	PracHour	0.21*	-	0.21+
	PerfExp	-0.36*	-	-0.36+
	SelCon	0.30*	-	0.30+
SRegHS (R^2 = 0.14)	ProgYr	-	-0.08	-0.08+
	FEduc	-0.25*	-0.08	-0.33+
	PerInt	0.23*	-	0.23+
	PerVal	0.28*	-	0.28+
Achieve (R^2 = 0.07)	QuaGrd	0.26*	-	0.26+

R^2 indicates how much variance in the dependent variable was explained by the path model.

* Direct effect is significant at the 0.05 level.

+ Total effect may be incomplete due to unanalysed components.

The outcome of primary interest in this study is students' music performance achievement, which is determined by highest qualification in music before entering university (0.26). The path model explains approximately 7% of variance in students' music performance achievement.

For students' motivation, there are three outcome variables according to the path analysis results (Figure 7.3): self-efficacy, personal interest, and perceived value. The main predictor for self-efficacy is father's educational level (-0.36), followed by program year level (-0.32), and parental involvement during early childhood (0.31). This model explains approximately 29% of the variance in students' self-efficacy. Personal interest is determined by father's educational level (-0.36). Approximately 13% of the variance in personal interest is explained by the model. The predictor of perceived value is program year level (-0.29), which explains approximately 9% of variance in perceived value.

There are four outcome variables for students' self-regulation, as enumerated in different dimensions: method, behaviour, time management, and help-seeking behaviour. There are nine predictors for method dimension. The predictors with largest total causal effects are accumulated performance experience (0.48) and self-efficacy (0.48), followed by father's educational level (-0.46), self-concept (-0.35), parents' musical background (-0.29), home musical possession (0.27), average practice hour (0.22), early parental involvement (0.15), and program year level (-0.15). The model explains approximately 48% of the variance in method dimension.

Behaviour dimension is determined by seven predictors. The primary predictor is personal interest (0.38). The remaining predictors of behaviour dimension, as indicated by total causal effect, are accumulated performance experience (0.26), highest music qualification before entering university (-0.22), father's educational level (-0.22), self-efficacy (0.21), early parental involvement (0.07), and program year level (-0.07). Approximately 17% of the variance in behaviour dimension is explained by the model.

For time management dimension, the predictor with largest total causal effect is accumulated performance experience (-0.36), followed by self-concept (0.30), and average practice hour (0.21). The path model explains approximately 24% of the variance in time management dimension.

Finally, there are four predictors for the help-seeking behaviour dimension. As indicated by the total causal effect, the main predictor is father's education level (-0.33), followed by perceived value (0.28), personal interest (0.23), and program year level (-0.08), which explains approximately 14% of the variance in the help-seeking behaviour dimension.

7.5 Results of Conducting Thematic Analysis of the Qualitative Data

Based on the results yielded from the above data analyses, thematic analysis of the qualitative data was undertaken as a way of complementing the quantitative results, and with the aim of providing a deeper understanding of the interactions between students' motivation, self-regulation, and their home learning environment. It also provides for an exploration of other significant factors not included in the quantitative study. Thematic analysis is an effective strategy employed to identify themes and patterns within the interview data so as to find relationships among the constructs. The coding process – the basic thematic analytic strategy – involves labelling recurrent themes and relationships with codes. As the main focus of the qualitative component was to enhance the quantitative research, a set of a priori themes was defined based on the theoretical constructs developed for the quantitative component of the study. Each of the themes is assigned a code and categorised into its respective group (also known as a 'meta-theme', a higher level abstraction of theme that does not associate with any code) (Guest et al., 2012). There are two predefined groups of themes - student motivation and family factors - with a third group - environmental factors - emerging during the coding process. Additionally, new codes were created to label the relationships found among the groups of themes to answer the research questions. A summary of the codes used is shown in Table 7.11.

Table 7.11. Summary of interview codes.

Code	Description
Student Motivation	
SelCon	Self-concept • Students' self-perception of their ability in general music learning.
SelEff	Self-efficacy • Students' self-perception of their ability to perform music.
PerInt	Personal interest • Students' personal interest in music.
PerVal	Perceived values

	• Students' perceived values of music for external rewards (i.e., future career).
SelReg	Self-regulation • Students' music learning strategies used during practice including cognitive strategies, metacognitive strategies, adaptive learning strategies, and resource management used by students to achieve goals of learning.
Expt	Students' expectation of themselves • Students' expectation to improve and succeed in their current music study and future professional career life.
Family Factors	
FamBcg	Family's musical background • Students who have family members (i.e., parents, siblings, and relatives) with musical background.
FamSupt	Family's support to students' music learning • Family's support to students' musical development and learning in terms of providing financial support, providing moral support, and creating a musical environment at home, from early childhood to date.
Environmental Factors	
EnvCom	The influence of community surroundings on students' motivation to learn music • The impact of community surroundings on students' musical development, interest in music, choice of pursuing a music degree, their engagement in music learning, their persistence in completing the music degree and their envisioned future music-related career.
EnvUni	University's environmental influences on students' motivation to learn music • The impact of the university's environment on students' choice of pursuing a music degree, their engagement in music learning, their persistence in completing the music degree, and their envisioned future music-related career.
Relationships between Themes	
FamBcg (Associated) Student Motivation	The relationships between family musical background and students' motivation • The relationships between family musical background (family members including parents, siblings, and relatives with musical background, such as knowing how to play a musical instrument or having a music-related job) and students' motivation (students' affect and cognition that instigate their motivated behaviours).

FamSupt (Associated) Student Motivation	The relationships between family support and students' motivation • The relationships between family support (a source of financial, moral, and cultural capitals, which can include participation in students' music learning process, paying for music lessons, providing them with necessary musical items, and moral support) and students' motivation (students' affect and cognition that instigate their motivated behaviours).
EnvCom (Associated) Student Motivation	The relationships between surrounding environmental factors and students' motivation • The relationships between surrounding environment (i.e., community centres, church, neighbourhood, and music learning centres) and students' motivation (students' affect and cognition that instigate their motivated behaviours).
EnvUni (Associated) Student Motivation	The relationships between university environmental factors and students' motivation • The relationships between university environment (i.e., university system, pedagogy, teachers, and peers) and students' motivation (students' affect and cognition that instigate their motivated behaviours).

NVivo software has been used to facilitate the coding process. In order to better explain the patterns observed in the quantitative data and to answer the research questions, the findings are presented according to the relationships between the meta-themes found in the qualitative interview data. It is important to note that presentation of the results according to themes may not provide a comprehensive depiction for each case, as may be said of narrative analysis, for example. However, this approach is appropriate considering the function of qualitative research in this study. Additionally, although quantification of the codes and themes is useful in building a systematic approach for obtaining general patterns in the data, this has to be done with caution so as to ensure the numbers are meaningful. According to Guest et al. (2012), quantification may not be appropriate, depending on the structure of data collection and clarity of the presentation. In this study, semi-structured interviews were conducted, meaning that not all questions asked of a particular interviewee were necessarily asked of other interviewees. Thus, the frequencies of the codes and themes presented may not be valid. Furthermore, the data organisation and coding technique have important implications for the interpretability of the quantified findings. It may be possible that an interviewee is conveying one particular theme and explaining a point in detail, but is then interrupted by the interviewer with a question so that the theme will be coded twice

rather than once (see Figure 7.6). For the above reasons, the quantification of findings is not reported.

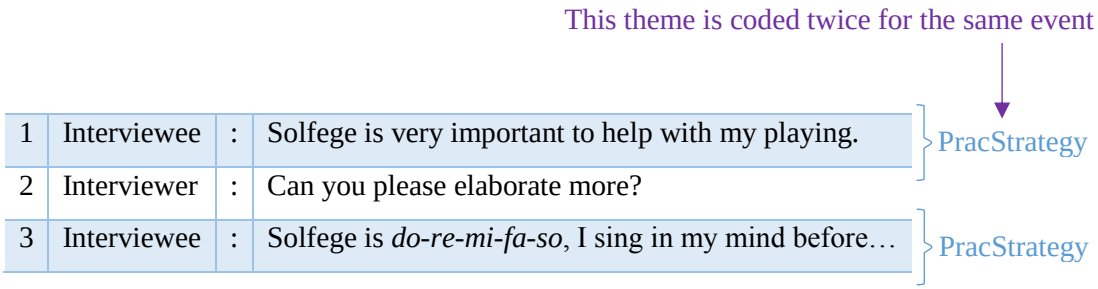


Figure 7.6. Example of coding technique used that may reduce the validity of the quantification findings.

Family musical background (associated) student motivation

It is found that the development of musical motivated behaviours in a few of the interviewees – musical interest and perceived values of music in particular – is associated with their family member's musical background:

> I like it, because I can sing with my dad. He teach me basic C major, A major. And then you can sing to everyone, I mean like children song, my hometown song, something like that. (Interviewee 15)

> I want, I really want to be a teacher, since young. Because I saw my mum, she teach music, so I get inspired. Sometimes I have her, playing piano for her as well, it's like fun. We can teach, but we like, I like to teach, it's very great communication. So, music teaching, this is what I want. So, I'm in the right track. Yes… (Interviewee 15)

> The most influential one, um… my father because my father playing guitar at church, then he want me to continue… my interest in music in school in university, and my aunty, because she teaching music at school, and I want to be like her. Teacher, music teacher. (Interviewee 9)

As illustrated above, Interviewee 15 likes music because she can sing with her father. This is one example of how parents with musical background may have greater involvement in children's learning and develop their musical interest. In addition, Interviewee 15's mother, who is a music teacher, also influences her musical interest and her perceived value of music as future career. Interviewee 9's father, who played guitar, would like his daughter to pursue

her musical interests, which may contrast with parents without musical background who may not support their children to further study music as a subject. Interviewee 9 also perceives the value of music to work as a music teacher in future, because her aunt was a music teacher.

Additionally, there is an association between family musical background and students' self-regulation, which is consistent with the quantitative findings:

> Actually, I was learning recorder that time, and then my mother, we had to buy a recorder, and then my mother played it. I think my mother should know how to sing previously, because she will talk about this, and she will say, "oh, this is *do*, this is *re*, this is *mi*", teaching me slowly. But I picked up quickly, I was also sensitive to music. … Actually, even until university, in my university, actually, what my mother taught me that time, laid a very strong basic. … Even now, you can simply play a song, I can sing the solfege, after singing the solfege, I can play on the piano, maybe play the melody line. Pick up very quickly, solfege. When solfege reaches here, my brain, it feels like it will process automatically, the solfege, *do-re-mi do-re-mi* will automatically appear. (Interviewee 17)

From the excerpt above, it can be observed that parents with a musical background could teach their children musical skills that can be applied to their later self-regulated learning process. It is also shown in the excerpt that Interviewee 17's mother, who teaches her daughter musical skills, can influence her daughter's development of self-efficacy because the daughter is able to master the skills and use the skills in her future learning. She has shown confidence in her instrumental playing, using the learned skills.

Family support (associated) student motivation

The 'family support' code, used in the analysis process, refers to family members' involvement in students' music learning and development processes through various forms of support, including, but not limited to, financial, social, cultural, and social supports. Almost all the interviewees indicated that family support had influenced their development of musical interest. Parents were considered to have played a critical role in exposing children to music prior to further development of their musical interest:

> … I am so fascinated on how the whole body moves involve with the organ, First in the organ, then my dad saw that I have actually this talent, then later he ask me to go for piano class, I think. (Interviewee 14)

> Why I learned music initially was because during kindergarten, there was a music class, during kindergarten, I saw teacher played music from a box, I got to know there was keyboard, okay, I went back and told my mother, there was a magic, what was that thing, this was very interesting, and then my mother told me, that was a piano. It happened that there was piano teacher in my neighbourhood, so I was being sent to learn piano. (Interviewee 19)

However, there are also cases where parents were less supportive towards their children's musical development:

> I started when I was form 5, it's very late because the music school is far from my place, I have to travel two hours from, two and half hour to go to music, so, my parents is very busy, they art school, so they cannot send me, so I very late to know music, study music. But I don't know where I got the interest, I just like it since I was young, but never got the chance to learn and… (Interviewee 10)

> I finished grade five exam that time, I prepared to take grade six, grade seven exams, and then I said I want, "can I have a grand piano?" My father said, "you are going to study form six for two years, at most, you will learn for another two years, and then you don't know which subject you are going to choose, and then you will study at other place, buying a piano will be a waste". I was just able to finish my grade six exam using the electronic piano. And then I tried to explain to the teacher my situation at home, because he needed the touch and feeling, especially at grade six, the exam requirements placed emphasis on feelings, melody. The grand piano's touch, it has weight, but electronic piano is very light. Um… felt aggrieved, felt aggrieved while playing, but it was very happy when playing. (Interviewee 13)

The negative cases highlight the significance of the students' personal interest, which caused them to persist in further music learning, also indicated by some of the interviewees:

> No. They didn't show a lot of interest. They learn because their mother asks them to learn. If you are not learning under your own will, it is very hard to learn well no matter how you are being forced to learn. (Interviewee 3)

> They asked why I want to stop, um, "you have learned so hard, you just have to hang on for a little while more till you finish". That time, I felt really bored already, and no mood to continue. (Interviewee 8)

This implies that there may be other environmental factors influencing students' interest and motivation to learn music, which is discussed in the following sections. Additionally, consistent with the results yielded in quantitative analysis, the interview data is indicative of an association between parental involvement and students' self-regulation:

> Actually, even until university, in my university, actually, what my mother taught me that time, laid a very strong basic. She shouldn't have expected me to study music. And then I realised, the solfege she taught me was a very strong basic for my music study. (Interviewee 17)

Surrounding environment (associated) student motivation

Many students suggested that environmental factors impacted their musical development before entering university. There were quite a few factors derived from their surrounding environment, including a music teacher, school, music learning centre, and religion. On a broader level, there were factors such as media, music examination system, and cultural values. Most of these factors were associated with the development of students' musical interest. Some factors were related to their perceived values of music and self-regulation.

Almost all the cases that suggest associations between music teacher and students' personal interest are negative cases:

> Maybe because the first piano teacher was very fierce, and then there was, there was an unpleasant piano learning experience. So, I stopped for a while. (Interviewee 13)

> When I was three, I excited to join it all, but after turning seven or eight, I start to hate all the music classes, because I cannot play the song, then the teacher keep on scolding or what, then I feel like it's something… it's like burden for me. (Interviewee 16)

> Later, that teacher kept beating us. Because I am not used to the style of being beaten and scolded, my father and mother rarely treat me like that at home… Maybe, I was only ten-year-old that time. So, I went there every time to cry, and I dared not tell my father and mother. I thought I did something exceptionally wrong, actually it was just about playing the wrong note. (Interviewee 19)

The negative effects have implications for the music teaching approach adopted in Malaysia. A revised teaching approach is needed, as the current approach can have an undesirable influence on students' self-efficacy:

> Because my cello… was not learned formally in secondary school. It was passed down from generation to generation by seniors, so there were some mistakes in terms of method. When I entered [university], the methods I used in the past seven years while learning cello were all wrong, I had to learn all over again. (Interviewee 13)

> She didn't teach well. I can be very frank now. Maybe she was not full time piano teacher, she had her regular occupation, so I discovered that, after I received formal music education, after entering college and then University H, I realised that the stuff she taught last time has a lot of flaw, hugely inadequate, knowledge was not comprehensive as well. … My foundation wasn't good, I knew it before I entered college. (Interviewee 19)

However, in terms of the effects of school on the development of musical interest, especially school with musical bands, orchestra, and choir, many students expressed their positive experiences:

> Ya, I wasn't sure, but then um… for me, music has been everything, even since secondary school, I was in choir, I was the president, I was usually like overseeing the music scene in my school. So, like… This kind of implant in me ever since… Even before secondary school, primary school also, I first started to perform there, and then I was like, when I perform, I play out with my whole heart, that's what I enjoy music. And then, after that also, of course, looking at that organ, like I mention, after I learn the skills already, I tried in the church. So since that from onwards I played in the church until now. (Interviewee 14)

> In my high school, there's a lot music co-curriculum. They have string orchestra, wind orchestra like… so I have been joining. I have been learning quite a lot music, just basic, not like expert, just basic through my high school. So, I think maybe my surrounding while I was in high school make me really like love music or something. That's how I could be studying music. (Interviewee 16)

Music learning centres also have similar effects on students' musical interest:

> I was still young that time, five years old. Maybe because I saw the musical instrument, and children's curiosity may be stronger, and the paintings in the Yamaha school were very beautiful, there were fairy, rainbow, everything was so attractive. Since then I started to pester my mother that I want to learn, plus teacher's advice, I was given the opportunity to learn. (Interviewee 6)

It is also significant that skills obtained from the music learning centres have served as a foundation to students' later self-regulated used of practicing strategies:

> No matter what song, I can just copy right playing with it in key C. And then, I don't understand also solfeggio thing, until I sign up for University H, I thought everyone can sing solfeggio just like me. When I come to class, I just knew that, oh, not everyone can exactly sing *do-re-mi* or just sight singing. Then I already get know, oh, that's how it become useful when I enter the Yamaha JMC, because they always ask us to sing first then play. So, right now, if I enter the piano class, if I cannot sing the tune, then I cannot play. (Interviewee 16)

> Very obvious, because I was trained by Yamaha, and I am a violinist. As a violinist, you cannot rely on the piano. It is unlike piano that the pitch is what you play. (Interviewee 3)

Irrespective of personal interest, the utility of music in future professional life is vital for a university student. A few students mention the negative influence of cultural values towards their future career:

> But still I have some problem to continue as a major progression you know. To go with like study for music… because of some [cultural] limitation in [my country], so, you cannot follow it as serious as Western you know. So, who is in home really I believe that you cannot follow music as serious as like Western. (Interviewee 1)

> But for the future, and for the sake of me, I take the music education. Because I know music performance in Malaysia… not mature. (Interviewee 12)

The above statements illustrate the limited and unpredictable career opportunities in the music field, which could deter students from choosing to study music as a major subject. However, it is interesting to see that religion has had a positive impact on one particular student's perception of the utility of music:

> This centre, what I mentioned just now, is opened by the church, emphasises on education. So, this is why I want to equip myself, because the church sees [the importance of] music education. Our next door is a home schooling centre, my church says that, he hopes our church members can do a good job in education, and then we will have a better society, better people to raise the next generation. So, that's why I said I want to go back to study music, want to equip myself. (Interviewee 19)

The church also has a positive influence on the musical interest of other interviewees:

> Yeah, I only hear from some, like the church, got children play music, so I like to see them, I like to see children performing, so I attract to learn music. (Interviewee 10).

> … but my dad saw that I like music in a sense that when I go to church, I was quite inspired, I quite like… I'm very fascinated about the organ. The church organ. (Interviewee 14)

In addition, students' musical interest is also associated with media and the examination system. An interviewee reports on the positive effects of 'media' on the development of her 'musical interest':

> … during twelve-year-old, and then, that time, Huang Yue Ni and Huang Jia Xuan, it was local, very popular for specialising in duet, the album they released became the trend, and then… I was especially interested with Huang Yue Ni and Huang Jia Xuan these two girls who played piano. When I saw them played the piano etc., I will take my book out to practise myself. (Interviewee 19)

On the other hand, the graded music examination system is reported by interviewees to have had a negative effect on their interest:

> I didn't enjoy playing that much last time because all I had to do is… I was told to play only exam pieces. So I was trained to play exam pieces. (Interviewee 11)

> Yeah, I was learning piano also, but didn't take any grades. The theory I did, take until like grade five something like that, then I stop, I cannot bear it already. So I prefer like music more free, less work base. (Interviewee 18)

University environment (associated) student motivation

Approximately half of the students elaborate on their university experiences in relation to their music learning. There are three major themes found to have influence on students' motivated behaviour within the university environmental context: the university system, teachers, and peers. As is the case with surrounding environment theme above, where the music teacher is seen to play an important role in fostering students' motivation during childhood, the university teacher is also found to be the most significant influencing factor. The university teacher's role, in terms of moral support and the particular pedagogical approach, has an important impact on students' self-efficacy, personal interest, perceived values of music, and self-regulation. Effective teaching can elevate students' confidence in their skills (self-efficacy) and enhance their self-regulation. Unfortunately, instead of receiving sufficient support from the teacher at the university, there is an interviewee who revealed that she sought teacher support outside the university to improve her skills, which in turn increased her confidence in music playing:

> I felt discouraged for a while during first year. Until first year, second semester, my situation improved after I looked for teacher outside of university. … Because the teacher is employed by the university, there is credit hours, so I follow this teacher. But if in terms of technique, I want a teacher who understand me more, that I felt is more suitable for me, so I find one outside of university. Because the fee we paid here every semester includes cello teacher. But if I can learn extra outside of university, I can have more feel, so I find teacher outside. (Interviewee 13)

She further explains that the teaching style employed by the 'teacher outside' helped her to develop an interest in practising:

> … he will give me a lot of freedom, such as my practice, "you don't have to play it like scale, C major, C-D-E-F-G, you don't have to memorise C-D-E-F-G rigidly, you can play staccato, and then andante, allegro, you try one a day, play different patterns", he said, "you play whatever you like, the main point is understanding the structure of C major", helped you to develop learning interest. He helped you to feel that you are more towards enjoying. And then, the basics are built up slowly and unconsciously. (Interviewee 13)

There is another interviewee who indicated a negative learning experience with her instrumental teacher, which held back her interest in music:

> When the diploma one, my principal lecturer is [name], he's from oversea also, he have high expectation on me, but this one, the local one, given easy pieces, I feel like no need to practise, only once a week. So, I begin to lost interest a little bit actually. (Interviewee 10)

Nevertheless, a university teacher's positive effect on students' self-efficacy and self-regulation was found in one case:

> Yeah, even much better than before. My principal lecturer also say my singing technique is more better than before, improving. … Yeah, because I love to learning something new. I'm still taking something from my lecturer, how to sing… (Interviewee 9)

Furthermore, teachers in the university have a positive influence in supporting students' perceived value of music as future career by giving them appropriate advice:

> Because I'm asking one of the lecturer, then I ask him, what is the best instrument or the biggest potential for my future. He said take the violin. Violin, very broad. I mean, a lot of people learn piano now. So, like my friends, they have grade eight, so like, wow, grade eight, okay… You can join orchestra with violin, that's one of the reason why I chose violin. (Interviewee 12)

> Actually, most of the time I put music first, but then, the most I'm worried is actually the job la. It's all music students actually worry. Ya, that's the thing, first thing I worried. But after I talk to Dr C, my dad was there also, we had a discussion with Dr C, then he's the one convince me, like don't worry about it, just take. So it's like, ok, I am convinced, let's do music. … Dr C told me that, music has a lot more to do, others things can relate besides performance and teaching. (Interviewee 14)

Being in a university system that was tailored to meet students' needs appears to have important effects on the development of personal interest and quality engagement in music learning:

> I am really envy with the conservatory approach, concentrate on practice only, no academic. You can choose other approach, for example, some schools, their approach is, don't look at CGPA [ranking system], just consider whether you pass or not, so your certificate does not show the level. (Interviewee 19)

> I expect more, to some more activities you know for universities because I believe that University A is not that much practical you know. They based on some classical and theory more, you know. Actually they call it like, we have the contemporary also, so we can have classical and contemporary but, it's more classical than contemporary, I believe. So, it's not what I'm exactly looking for, but as long as I can get that degree, so… (Interviewee 1)

Finally, although not frequently mentioned by the interviewees, peer pressure and peer support can have mixed positive and negative effects on students' self-confidence in music:

> I will, I will tell my classmates. Then, my classmates will say 'if you mention you did not play well once again, I will beat you' etc. … encourage each other. (Interviewee 6)

> Actually, I was okay, first I got here. Then, a little bit shock. Because back then, I was the only one who… in this music area, you know. But here, everyone can play. Oh, he is better, she is better… Like everybody can play. Okay, start to feel, yeah… and then first feeling down, okay, I'm not that great in this, a lot more are great, but I can still carry on myself, I think. (Interviewee 15)

The relationships among the themes as discussed above are summarised and presented in graphical form in Figure 7.7. Straight lines are used in the figure to indicate the relationship between the two themes. Green lines refer to positive relationships, red lines to negative relationships, and blue lines refer to cases where both positive and negative relationships are found between the themes. It is important to note that the relationships as shown in the graph cannot be generalised but limited to the participants of this study. The themes reported above are grouped as following:

a) Student motivation
   - Self-concept
   - Self-efficacy
   - Personal interest
   - Perceived values
   - Self-regulation
b) Family factors
   - Family background

- Family support

c) Surrounding environment
   - Teacher
   - School
   - Music centre
   - Examination system
   - Religion
   - Culture

d) University environment
   - Teacher
   - University system
   - Peer.

7.6 Summary

This chapter reports the results of the quantitative and qualitative data analysis. Multiple regression and path analyses were used as the quantitative data analytic techniques using the LISREL software. Both techniques were used to examine the relationships among the personal-environmental factors and students' music performance achievement. Multiple regression results provide an overview of the relationships. The preliminary results were carried forward into subsequent path analysis. The relationships were tested based on the research questions (see Chapter 1), and the hypothesised model (see Chapter 2) developed in this study.

Thematic analysis was carried out to support the quantitative findings and deepen the understanding of the research topic. This technique involved developing codes to label the themes and patterns identified within the interview data. A set of a priori codes were developed based on the constructs employed in the quantitative study, and other codes were developed based on the themes found during the analysis process. NVivo software was used to facilitate the coding process and analysis of the relationships between the themes.

The mixed methods design employed particularly for the purpose of this study, emphasised the advantages of combining quantitative and qualitative methods to address the research questions. Thus, the quantitative and qualitative results were compared and combined to answer the research questions. The findings are presented in Chapter 8.

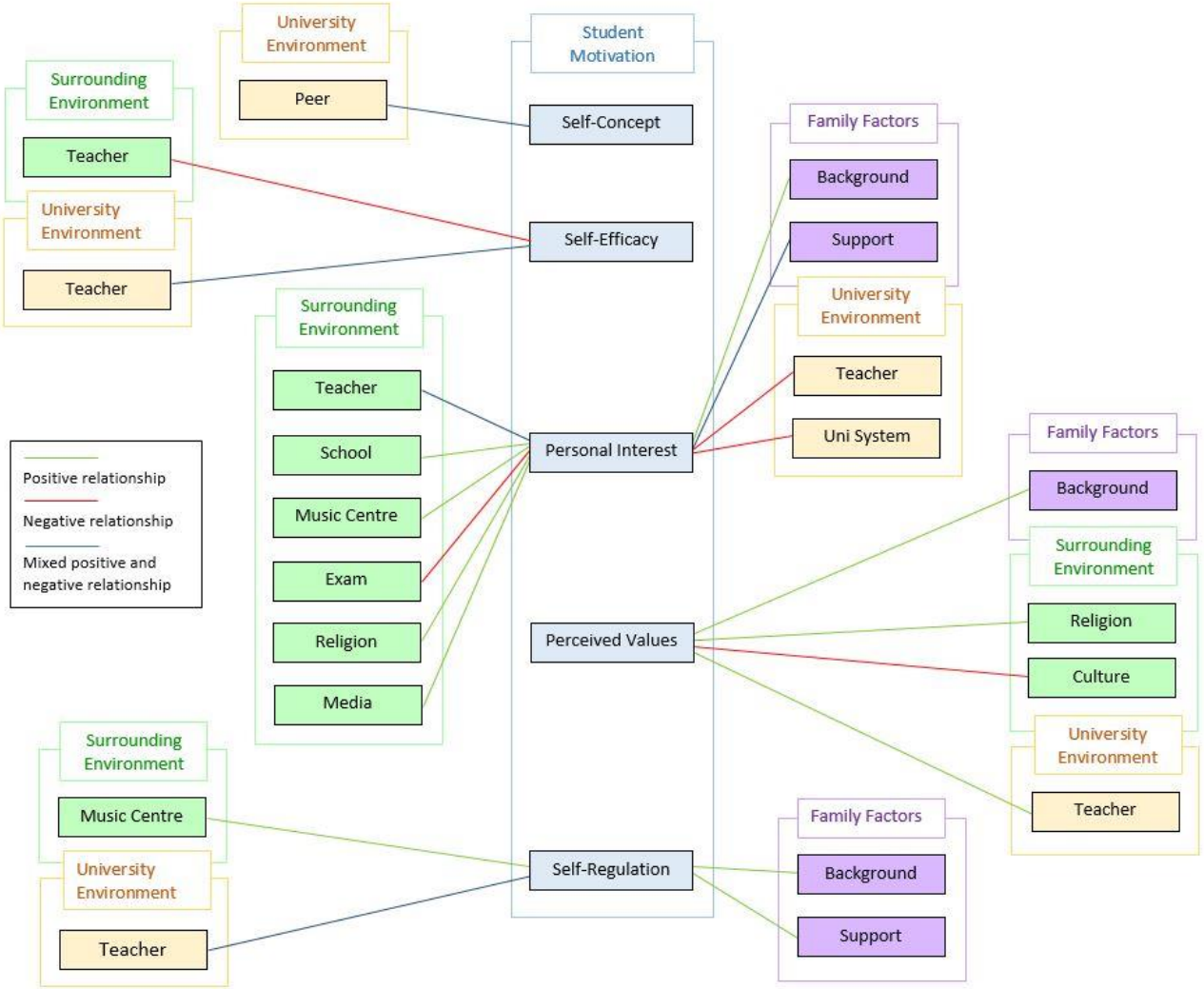


Figure 7.7. Overview of the relationships among student motivation, family and environmental factors.

Chapter 8: Conclusions

8.1 Introduction

The main purpose of this study is to examine the relationships between personal-environmental factors and measured achievement of students' music performance within the Malaysian higher education context. The rationale for the implementation of this study is the lack of empirical research on student learning processes specific to the context of music in higher education (Jørgensen, 2000, 2010) and Eastern cultural perspectives (Hallam, 2009). In the field of music, higher education plays a role in providing an optimal learning environment to foster students who are "motivated, versatile, adaptable, open to new learning opportunities, and have a strong identity as a musician" (Hallam, 2014, p. 335; see also Johansson, 2012; Jørgensen, 2000; Ministry of Higher Education Malaysia, 2010). The development of these attributes is influenced by a range of personal-environmental factors, such as self-perceived ability, perceived values of music, and home learning environment (Brand, 1986; Hallam, 2009; Zdzinski, 2011). It is important to understand students' learning processes so as to be able to develop effective teaching strategies that facilitate students' success as independent professional musicians in the future (Jørgensen, 2000).

This study uses a mixed methods approach. Contemporary and rigorous quantitative research methods are used to address the lack of advanced quantitative research methods in the music education research field (Overland, 2014; Stefanic, 2015; Zelenak, 2015b). Qualitative research methods are used to analyse information-rich data, so as to support the quantitative findings and also expand knowledge on the study topic (Creswell, 2015).

The quantitative research procedures can be summarised as follows: (a) developing a research instrument comprised of different scales designed to measure students' motivational beliefs, parental involvement, self-regulation, and achievement in music performance assessment; (b) collecting data using the scales; (c) conducting statistical analyses using confirmatory factor analysis (CFA) and the Rasch rating scale model to confirm that the scales satisfied the measurement properties, thereby establishing validity and reliability; (d) carrying out scaling procedures to handle missing data, testing for multicollinearity and transforming scores to measures; and (e) conducting data analyses using multiple regression analysis to provide an overview of the results, and path analysis to

investigate the postulated relationships among personal-environmental factors and students' music performance achievement.

The qualitative research procedures involved (a) developing a semi-structured interview protocol to guide the inquiry into the factors that impact students' motivation in music learning; (b) interviewing university music students; (c) transcribing and translating (into English) the audio recorded interviews; and (d) carrying out thematic analysis to identify and interpret the associations between significant themes. In order to ensure the quality of the study in terms of credibility, transferability, dependability, and confirmability, strategies including member checking, audit trail, use of consistent templates, development of an interview codebook, and external/peer review were employed.

8.2 Findings of the Study

This section provides responses to the research questions as formulated in Chapter 1, based on the quantitative and qualitative results. The main research question aims to identify the relationships between the factors of students' expertise level, motivational behaviours, home environment, self-regulation, and music performance achievement. In a broad sense, the findings suggest that students' level of expertise, parental factors, and home learning environmental factors are associated with their motivational beliefs and self-regulation. However, only prior achievement is found to have an effect on students' music performance achievement. The question of "what factors influence performance achievement" remains open in the present study. Interviewed students generally express the view that the parental role is crucial in providing them with opportunities to learn music and to foster their musical interest. Students also indicated the important role of the teacher in developing their musical skills and interest. The findings are discussed in greater detail in the following sections.

8.2.1 Students' Level of Expertise

RQ 1a. What is the relationship between students' level of expertise and their motivation towards instrumental music learning?

Students' level of expertise in this particular study is indicated by a range of attributes related to their accumulated musical knowledge and experiences.[2] Student motivation towards

[2] The attributes used to indicate students' level of expertise are (a) program year level; (b) number of years playing the principal musical instrument; (c) number of musical instruments known how to play; (d) average practice hours per day; (e) highest music qualification before entering university; (f) performance frequency in the past 10 years; and (g) frequency of participation in competition in the past 10 years.

instrumental music learning is measured by four variables based on the expectancy x value theory.[3]

- **Does students' level of expertise have an effect on their self-perceived ability in terms of self-concept and self-efficacy?**

  The results show that higher year level students (i.e., fourth year) tend to have lower self-efficacy than lower year level students (i.e., first year).

- **Does students' level of expertise have an effect on subjective task value in terms of personal interest and perceived value?**

  The results show that higher year level students (i.e., fourth year) tend to have lower perceived values of music than lower year level students (i.e., first year).

These results are consistent with previous research findings within the elementary and secondary school sectors (e.g., McPherson & O'Neill, 2010; McPherson et al., 2015; Wigfield & Eccles, 2002). According to McPherson and McCormick (2006), when students become increasingly skilled at playing their musical instrument, they could be more aware of their own abilities and more realistic about the benefits of playing music. McPherson and McCormick suggest that this was because of the increased complexity in advanced musicianship. Therefore, it is more difficulty to maintain and expand mastery over musical instruments. For this reason, there is a decrease in self-efficacy and perceived values of music.

RQ 1b. Does students' level of expertise have an effect on their self-regulation?

The measures of students' self-regulation were classified into four dimensions: method, behaviour, time management, and help-seeking behaviour.[4] The findings suggest that there are four attributes influencing different dimensions of students' self-regulation: program year level, average practice hours per day, accumulated performing experience, and highest music qualification (e.g., ABRSM Grade 8) before entering university. The relationships

[3] The measures of student motivation towards instrumental music learning are (a) self-concept: students' self-perception of their ability in learning music in general; (b) self-efficacy: students' self-perception of their ability specific to music performance tasks; (c) personal interest: students' intrinsic interest in music; and (d) perceived values: students' perceived values of music to obtain an external reward.

[4] The operationalised definitions of the dimensions of self-regulation in this study are: (a) method: task-oriented learning strategies; (b) behaviour: metacognition and orientations toward reflective thinking of own learning; (c) time management: ability to concentrate on task and plan the use of time effectively; and (d) help-seeking behaviour: tendency to seek help from others to improve learning.

between attributes of expertise level and self-regulation is underexplored in the music education field, although a number of studies have investigated the relationships between students' motivational beliefs and self-regulation (e.g., McPherson & Renwick, 2011; Miksza, 2006; Nielsen, 2004). Researchers and educators are encouraged to further investigate this area and seek confirmation of the findings of the present study.

RQ 1c. Does students' level of expertise have an effect on their music performance achievement?

A set of criteria is defined for the purpose of this study to measure the assessment outcomes of students' music performance. This is referred to in this study as 'music performance achievement'. The results show that students who have higher music qualifications before pursuing a music degree perform higher in their assessment. This result is consistent with the existing findings in other fields such as mathematics and science (e.g., Guo et al., 2015; M. O. Martin et al., 2008). Hallam (2009) also indicates that successful musical achievement can raise students' motivation and self-esteem, and that these attributes will be carried forward to subsequent learning tasks. Therefore, teachers and universities should create carefully structured opportunities for students to experience successful performance, ensuring they are performing according to their interest and ability levels.

8.2.2 Students' Motivation and Self-Regulation

RQ 2a. What is the relationship between students' motivation and their self-regulation?

The findings are consistent with much recent music research, which finds that motivational beliefs (e.g., self-efficacy, importance of music, and musical interest) instigate students' engagement in self-regulated musical practising (e.g., McCormick & McPherson, 2007; McPherson & McCormick, 2006; McPherson & Renwick, 2011; Miksza, 2006; Nielsen, 2004; Renwick, 2008).

- **Does students' self-perceived ability in terms of self-concept and self-efficacy have an effect on their self-regulation?**

  One noteworthy finding is that students with higher self-concept have a lower level of self-regulation specific to their use of strategies to optimise practice outcomes. This is in contrast to the finding that students with higher self-efficacy have a higher level of self-regulation. As discussed in the literature review (see Chapter 2), self-concept and self-efficacy have distinctive characteristics, although they both indicate self-perceived ability (Bong & Clark, 1999; Bong & Skaalvik, 2003). The different findings confirm

that these two constructs have different predictive and explanatory power in respect of students' behavioural and learning outcomes. Existing research into self-concept and self-efficacy as separate constructs in relation to self-regulation is limited in its ability to explain this finding, and further research is required.

- **Does students' subjective task value in terms of personal interest and perceived value have an effect on their self-regulation?**
  The results show that higher personal interest and perceived value of music can increase students' self-regulation. These are consistent with previous research findings, as mentioned above.

RQ 2b. What is the relationship between students' motivation and their music performance achievement?

- **Does students' self-perceived ability in terms of self-concept and self-efficacy have an effect on their music performance achievement?**
  This research found no significant relationship between students' self-perceived ability and their music performance achievement.

- **Does students' subjective task value in terms of personal interest and perceived value have an effect on their music performance achievement?**
  Similarly, there was no relationship found between students' subjective task value and music performance achievement.

The findings are inconsistent with previous findings that self-efficacy has a significant impact on students' performance examination outcomes (e.g., Jiang et al., 2014; McCormick & McPherson, 2007; McPherson & McCormick, 2006). However, the majority of the previous research was conducted within the primary and secondary school context. This finding shows that the effects of students' motivation on music performance achievement can change across ages. There is need to carry out more research in this area, so that empirical evidence can be provided to universities and thereby influence curriculum design and pedagogical approaches.

RQ 2c. What is the relationship between students' self-regulation and their music performance achievement?

The findings suggest that students' self-regulation has no significant association with their music performance achievement. Although numerous studies (e.g., Ericsson et al., 1993; Hallam, 2004; McPherson & Renwick, 2011; Sloboda et al., 1996; Williamon & Valentine, 2000) suggest that advanced musicians tend to have higher practice effectiveness, research that specifically examines the relationship between self-regulation and music performance achievement is limited in its ability to explain the present findings. Future research that includes these two factors is strongly recommended.

8.2.3 Home Learning Environment

RQ 3a. What is the relationship between parental involvement and students' motivation?

Parental involvement in this study refers to parents' support and participation in students' music learning processes. This construct was measured in two different states: current involvement and involvement during early childhood.

- **Does parental involvement have an effect on students' self-perceived ability in terms of self-concept and self-efficacy?**

  Students have better self-efficacy when parents are more involved in children's music learning processes. This result is consistent with existing studies (e.g., Fan & Williams, 2010; B. P. Smith, 2011; Zdzinski, 1996), which suggest that parental involvement at the early stage helps to develop students' affective learning outcomes.

- **Does parental involvement have an effect on students' subjective task value in terms of personal interest and perceived value?**

  Consistent with previous findings (e.g., Fan, Williams, & Wolters, 2012; Zdzinski, 1996), students indicated that parents have an important role in helping them to develop their musical interests.

RQ 3b. What is the relationship between parents' socio-economic status and students' motivation?

Parents' socio-economic status as a form of financial, social, and cultural capital is considered crucial to create musical learning opportunities and support children's musical interest and development.

- **Does parents' socio-economic status (highest level of education, musical background, and home musical possessions) have an effect on students' self-perceived ability in terms of self-concept and self-efficacy?**

  There is a notable finding that students have lower self-efficacy when the educational level of their father is higher (e.g., PhD degree). This is inconsistent with previous studies and established theories that higher parents' educational level has a positive effect on students' motivational development (e.g., Buchmann, 2002; McClellan, 2011; Mullis et al., 2012; Zdzinski, 2011). However, the majority of the previous studies were situated within a Western cultural context, and may not be applicable to Asian and South-Eastern cultures, where different cultural ideologies might lead to different parental beliefs and parenting practices (Cheung & Pomerantz, 2012; Custodero & Johnson-Green, 2003; Gaunt & Hallam, 2009; Hallam, 2009). Further research to explore the relationships among cultural ideologies, parental beliefs, and students' musical motivation within Asian and southeast cultural contexts is encouraged.

- **Does parents' socio-economic status (highest level of education, musical background, and home musical possessions) have an effect on students' subjective task value in terms of personal interest and perceived value?**

  The results show that students have lower interest in music when the educational level of their father is higher (e.g., PhD degree). This is inconsistent with existing findings, as shown in the answer to the above question. Again, the reason for this finding could be cultural differences that affect parental beliefs and practices.

  Additionally, students indicated that financial support from parents, such as provision of musical lesson and musical instruments, facilitates their developing musical interests. Another finding was that socio-cultural support within the home learning environment and parents' musical background make important contributions to the development of students' musical interests and perceived values of music. These findings highlight the significant role of parents in creating an inspirational and supportive learning environment for the development of students' musical motivation.

RQ 3c. How does parental involvement influence students' self-regulation?

The path analysis results show that parental involvement does not influence students' self-regulation. This does not by any means necessarily indicate that there are no relationships; it could simply be that the relationships are insignificant. This assumption is evidenced in

the interview in which the student reported parents' involvement in her music learning process helped her to established self-regulated practicing strategies. This is consistent with the literature that parental involvement plays a key role in supporting and developing children's self-regulation in practice (McPherson & Davidson, 2002, 2006; Sloboda et al., 1996). Although the evidence may not be as significant, however, to a certain extent, parental involvement could promote children's persistence in music learning and self-regulation needed to continue as an advanced learner at the university level.

RQ 3d. How does parents' socio-economic status influence students' self-regulation?

A notable finding is the significant relationship between father's educational level and students' self-regulation. It is found that higher father's educational level leads to lower students' self-regulation. This is inconsistent with the theoretical perspectives that parents with higher educational level normally hold a more positive attitude and have higher educational expectations of their children, in ways that can promote students' motivation and self-regulation (Creech, 2009; Mullis et al., 2012). As discussed in RQ 3b, the differences between cultural values might be the reason for this finding contrasting with the existing theoretical perspectives. However, research that explicitly investigates the relationships between parents' socio-economic status and students' self-regulation is almost non-existent. Therefore, it is not possible to compare the finding in relation to this research question with the findings of previous studies, so replication of this study is recommended.

RQ 3e. How does parental involvement influence students' music performance achievement?

There is no evidence found in the present study that parental involvement influences students' music performance achievement. This is similar to Zdzinski's (1992) finding that parental involvement generally does not relate to music performance achievement. The reason might be the role of parents as mediators (Creech, 2009; Fan & Williams, 2010). The mediating effects of parents, through provision of moral, music, cultural, and financial support, may not have a direct impact on students' achievement, but could facilitate their musical development which indirectly influences achievement. Zdzinski (1992, 1996) also comments that the influence of the parental role might change at different age levels. Nevertheless, with a lack of empirical research in this area, the question of the relationship between the selected aspects of parental role and students' musical achievement remains ambiguous (e.g., Brand, 1986; Davidson et al., 1996; Wills, 2011; Zdzinski, 1992, 1996). Thus, this researcher strongly encourages others to conduct more research into this area.

RQ 3f. How does parents' socio-economic status influence students' music performance achievement?

The findings suggest that parents' socio-economic status does not influence students' music performance achievement. Research that explores the relationship between parents' socio-economic status and students' music performance achievement is currently lacking. Hence, replication of this study is recommended so as to provide further empirical evidence for future reference.

8.2.4 Social Environmental Factors

RQ 4a. What are the factors that are associated with students' motivation towards instrumental music learning, other than the hypothesised factors as specified in research questions 1, 2, and 3?

Further to those discussed above, there are several additional factors identified from the students' interview data. There are two major themes derived from the students' social environment: surrounding environment at the beginning stage of their music learning, and university environment. As stated by Bandura (1989b), in the exposition of his social cognitive theory, an individual's knowledge development is situated within the context of social environmental interactions, experiences, and influences. Within the field of music, Zdzinski (2011) proposes in his *Social Environment of Instruction Model for Music Education* that social environmental factors beyond family factors, such as peer influences, school culture, and community contributions, provide important support to students' musical development. As students grow older, in particular, the need for parental support may dwindle or cease and be replaced by other form of support from their social system (Zdzinski, 2011). There are seven sub-themes identified under surrounding environment: music teacher, school, music learning centre, religion, media, music examination system, and cultural values. Three sub-themes are classified under university environment: teacher (teaching approach and advice), university system, and peer influence. All these themes are found to impact students' motivation. These findings suggest the important impact of social environmental factors. However, there is still a lack of empirical research on the relationships between social environmental factors and students' musical motivation to support and compare the findings of the present study. Thus, research within this area is encouraged and recommended.

8.3 Implications of the Study

There are four major implications arising from the findings and research design employed in this study: (a) theoretical implications, (b) methodological implications, (c) implications for music in Malaysian higher education, and (d) implications of parent-student-teacher relationships in musical motivation development. The highlights of the findings, as summarised below, contribute to implications of the study:

- Students exhibit decreased self-efficacy, perceived values of music, and self-regulation when they are progressing towards a higher level in their music program.
- Parental involvement during childhood has a positive influence on students' motivational beliefs in music (i.e., self-efficacy and musical interest).
- A father who has higher educational level leads to a lower level of student's self-efficacy, musical interest, and self-regulation.
- In the student interview data, three important factors influencing students' musical motivation are identified: teachers, university environment, and surrounding community.

8.3.1 Theoretical Implications

The current study contributes to theoretical knowledge in the music field by:

a) extending the existing theoretical framework and models on the relationships between personal-environmental factors and measured achievement of students' music performance,
b) expanding research and knowledge within the context of music in higher education, and
c) providing further understanding of the study topic within an Eastern cultural context.

There is a lack of research that investigates the influences of social environmental factors on students' musical learning outcomes. This study provides empirically-based analytical procedures that can be used to test and extend the existing theoretical frameworks, and models such as Hallam's (1998) *Model of Instrumental Music Learning*, and Zdzinski's (2011) *Social Environment of Instruction Model for Music Education*. The findings confirm that there are significant relationships between students' level of expertise, motivational beliefs, parental factors, self-regulation, and music performance achievement.

Additionally, this study expands music education research and knowledge within the higher education context. Jørgensen (2010) emphasises the need to conduct music research in higher education, as a specific area, to provide better understanding and explicit reference to the institutional context. This is particularly crucial for strategic planning and decision making, particularly in relation to the development of an effective music education system in higher education. Quality tertiary music education systems are important for the development of self-reliant, flexible, and entrepreneurial musicians, enabling graduates to manage the diverse and ever-changing working environment.

Finally, many of the existing studies have been carried out within the Western context. There are few similar research studies that have been conducted in the Eastern context. Music can have different cultural values stemming from the varying economic, social, and political stances of countries (Hallam, 2009). There is a need to model the pedagogy pertinent to the musical system rooted within the culture so as to enhance students' learning (McCarthy, 2012). For instance, an interesting finding to arise from this study conducted in Malaysia is the negative effect of fathers' highest education level on students' motivational beliefs and self-regulation. A father who has a higher educational level is perceived to have better financial ability and higher home cultural values to support students' music learning, and it might be that the cultural value of music in Malaysia may have lower status compared to mainstream subjects, such as science and mathematics. Therefore, a father with a higher educational level may cause a student to have lower self-perceived abilities, because the student is studying a subject that is not valued as much by society. Nevertheless, further investigation is needed to provide a deeper understanding of this phenomenon, and to compare and confirm this finding.

8.3.2 Methodological Implications

There are several methodological implications arising from this study:

a) Mixed methods research design
b) Contemporary measurement modelling approach (Rasch model)
c) Transformation of raw score to measures
d) Path analysis technique.

Several researchers have emphasised the need for contemporary music education research to include both macro and micro perspectives, combining multiple data sources and various methodologies to strengthen research rigor and utility (see Zelenak's (2015b)

review). The present study satisfies these aspects using a mixed-methods research design. This approach draws on the strengths of both quantitative and qualitative methods to provide a better and deeper understanding of the study topic.

In addition, contemporary statistical procedures, namely Rasch analysis, have been carried out to validate the quantitative research instruments and transform raw scores to measures. The Rasch modelling approach is a contemporary method, which offers several advantages in satisfying the requirements of measurement invariance (see Chapter 4), used in many international large-scale studies. Rasch modelling has rarely been applied in music education research. The researcher found only a few studies that used Rasch modelling for instrument validation in the field of music (e.g., Bond & Bond, 2011; C. C. Leung, Wan, & Lee, 2009; B. J. Pascoe & Waugh, 2001), and examination of rater effects in music performance examination processes (e.g., Wesolowski et al., 2015; Wesolowski et al., 2016). Thus, one of the methodological implications is to highlight and demonstrate the effectiveness of the use of Rasch modelling in music education research.

As discussed in Chapters 4 and 6, the use of raw scores as measures can raise concerns about the utility of the inferences made. A weighted likelihood estimation (WLE) technique was employed to transform raw scores to measures so as to reduce estimation bias in the study. The WLE scores are further transformed to W scores, to thereby eliminate negative and decimal values and facilitate the interpretation of the analysis results. These methods have previously been employed in large-scales studies, such as TIMSS and PISA.

Looking at the research paradigms of articles published in eminent music journals, several studies have identified a trend of using quantitative methodologies to carry out music education research (e.g., Rutkowski, Thompson, & Huang, 2011; Yarbrough, 2002; Zelenak, 2015b). Quantitative analytic techniques commonly used in previous music education research are descriptive analysis, regression analysis, chi-square test, t-test, analysis of variance (ANOVA), and factor analysis (Zelenak, 2015b). Stefanic (2015) encourages the consideration of advancing quantitative analytic techniques for music education research, and the present study has arguably answered that call, drawing on the technique of path analysis. There is little existing music education research that uses this method (e.g., McPherson, Bailey, & Sinclair, 1997; Sang, 1985). Path analysis technique has the advantage of testing hypothesised relationships between the measured (observed) variables. This technique also has the benefit of taking into account the interaction effects of other

variables in the path model, when compared to simple and multiple regression analyses. Furthermore, it facilitates understanding of the modelled relationships by enabling them to be depicted graphically in a path diagram.

8.3.3 Music in Malaysian Higher Education Implications

A serious concern arising from the current findings is decreased student motivational beliefs (i.e., self-efficacy and perceived values of music) and self-regulation as they progress through year levels in the university. Motivation and self-regulation in musical practice are crucial to producing self-directed musicians capable of achieving a sustainable career (Lehmann et al., 2007; McPherson & Zimmerman, 2002; Renwick & Reeve, 2012). Thus, there is a need to map a learning environment that facilitates the development of students' motivational beliefs. During interviews, students commented on the teaching approach and the learning environment at the university. The findings that derive from these data provide important implications on the role of teachers and universities in improving music education within the higher education context.

Unfortunately, Collens and Creech (2013) argue that many instrumental music teachers in higher education institutions "have not been trained in philosophical, conceptual or methodological approaches to education or to the interpersonal management of long-term one-to-one relationships" (p. 152). Concerns in relation to teachers' pedagogic approaches are evident in students' interview data; a significant number of students expressed their perception of the lack of teacher support. Rather than the conventional authoritative master-apprentice approach, this researcher suggests the establishment of collaborative learning relationships between teachers and students so as to work towards a mutually shared goal (Collens & Creech, 2013). From this perspective, students could be given the opportunity to take responsibility for their own learning and have a voice in their learning process, and thereby facilitate the development of their perceptions of self-ability and value as musicians.

Universities can promote students' independent learning and performing experiences by extending the collaborative learning environment from teacher-student relationship to peer learning and support. An environment that fosters a collaborative learning culture among students can encourage them to learn from each other, facilitate the development of motivation to engage in deliberate practice, create informal performing opportunities to their peers, and support each other to foster positive attitudes (Latukefu & Verenikina, 2013).

8.3.4 Musical Motivation: Parent-Student-Teacher Implications

The findings indicate that parental involvement and father's educational level are related to students' self-efficacy and musical interest. These suggest the need to establish good parent-student-teacher relationships during the early stage of music learning. Appropriate communications between teachers and parents can facilitate sustained student commitment and interest in music learning. Such communications enable parents to understand the value of learning music and their children's learning progress. These help parents to provide necessary learning resources for their children as well as behavioural, cognitive, and personal supports (Creech, 2009, 2010). The communications are also imperative to assist teachers in understanding students' needs. Teachers can design teaching strategies based on students' needs so as to give them opportunities to actively engage in the music learning processes.

8.4 Limitations of the Study and Future Recommendations

Limitations are inevitable in every research study. The challenges encountered during data collection, such as time constraints and ponderous bureaucratic processes, led to several limitations. Firstly, the anticipated number of participants was reduced. Subsequently, the plan to undertake random sampling could not be implemented, and a purposive sampling technique was adopted instead. This alternative strategy was carried out to obtain the maximum number of participants, so as to have a large enough sample size for quantitative data analysis. Thus, the findings of this study are only limited to the sample and cannot be generalised to represent music degree students in Malaysia.

The same constraints impacted on the analysis of data derived from the quantitative approach. The relatively small number of valid cases for quantitative analysis may influence the significance test of the hypothesised relationships between the variables. However, this issue was addressed using mixed methods research design, in which the qualitative results can be used to support the quantitative findings.

Furthermore, path analysis technique employed in this study is limited to single level data analysis only. The data collected are hierarchical or nested in nature, as it consists of two distinct levels: student and university. Thus, there is a need to extend this study using multilevel analysis technique. Multilevel analysis was not carried out due to the small sample size issue; there is a minimum sample size requirement to obtain reliable analysis results.

It is also important to acknowledge the potential bias of the researcher in interpreting the qualitative data. However, efforts have been made to increase the objectivity and accuracy of the interpretation. This includes creating an audit trail, conducting member checking, and asserting the philosophical stances that guide the researcher in her research. In addition, thematic analysis was chosen to better fit the purpose of using qualitative data to support the quantitative findings. Thus, the qualitative results are not able to fully represent each interviewee.

Otherwise, the factors examined in this study are not the only factors that impact students' motivation, self-regulation, and music performance achievement. The social environment is much more complicated than is able to be represented within the scope of this current study, and there is no doubt many more factors that could exert significant effects.

The complexity of the music performance assessment situation can lead to difficulty in achieving consistency across assessments. Particularly, in the context of this study, the differences in terms of assessment time allocation, choices of musical pieces for examinations, assessment locations, and musical instruments could have an impact on the ratings given to a performance. Although it is the nature of music performance assessment, attention should be given to these aspects in future research studies.

Other concerns are fairness of rater judgement and bias. Raters' characteristics, experiences, and familiarity with the students can influence the assessment outcomes. Additionally, this study relied on raters' interpretation of the assessment criteria as training was not provided. Explicit descriptions were provided to assist raters in applying the assessment criteria to judge students' music performance. It is suggested that contemporary statistical procedures can be employed to further investigate issues related to rater fairness. The results can be used to develop effective strategies, such as provision of rater training to minimise bias.

The following recommendations are made based on the limitations as discussed above:

a) Similar research could be replicated using a larger sample size and random sampling technique, so that the results are representative of the target population.
b) It is necessary to extend research beyond Malaysia to other countries to confirm and explain the findings of the current study within other contexts.

c) Multilevel analysis could be considered due to the hierarchical nature of the data, so as to explore the effects among the variables at different levels.
d) There is a need to extend the current research instrument to include other factors that influence students' musical motivation development, learning processes, and outcomes.
e) It is important to consider assessment fairness. Concerns such as rater effects and gender bias can be detected using differential item functioning and Many-Facets Rasch modelling approach.

It is important to address all the limitations of the present study so that any future replication of the research in music within the higher education context can provide more meaningful results. The rapidly changing environment also implies the vital need to advocate for continuous research in the field of music education, enabling up-to-date policy decisions and teaching practices for quality learning experiences and outcomes.

8.5 Concluding Remarks

There is still much more to explore in music education in terms of the relationships between the factors considered here and their influences on students' motivation and music performance achievement. The social learning environment is more complex, and involves more factors, than can be examined within the scope of this study. Yet, this study has embarked on a path to investigate and address concerns that demand attention in the music education field, and can serve as a basis for further research work.

One of the noteworthy findings of this research study is that when fathers have higher educational levels, students tend to have lower self-efficacy and interest in music. This contrasts with the research findings in other subject areas, such as science and mathematics. A possible reason could be the lower status of music, compared to mainstream subjects, in Malaysia. Thus, parents who accomplished a higher level of education might expect their children to focus on subjects other than music. However, as many studies have emphasised and established the benefits of music education, should universities and music schools be doing more to promote the status of music as both an academic study and a serious profession in Malaysia?

The other notable finding is that students' motivation and self-regulation have no significant impact on music performance achievement. In fact, music performance is very much presentation of self in front of others. University students, in particular, might be more self-conscious as they are mostly young adults. Motivation might help them to engage and persist in the learning process. Yet, in assessment situations, 'performance anxiety' could be the key factor that affects their performance. This speculation certainly needs further investigation.

The methodological approach used in this study is considered its major strength, as it covers both research ideals (quantitative and qualitative). Another strength is the use of contemporary statistical techniques. While still to some degree preliminary in nature, due mainly to the small number of participants, this study has nevertheless achieved high standards of rigor, and stands as a methodological model for future work.

This researcher has taken the initiative to draw together a specific framework for this study in music education research that has had little previous application in this field. Music is a realm that is unique and extraordinary, waiting for further exploration. Researchers are encouraged to engage in the development and implementation of music education-specific frameworks, so as to provide solid evidence for educators to build better teaching and learning experiences, and achieve enhanced learning outcomes, in university music education.

Appendices

A. Ethics Approval: The University of Adelaide
B. Flow Chart of Activities Involved in Applying to Conduct Research in Malaysia
C. Ethics Approval: Malaysian Economic Planning Unit (1)
D. Ethics Approval: Malaysian Economic Planning Unit (2)
E. Survey: Participants' Information Sheet and Survey Questionnaire
F. Assessment: Participants' Information Sheet and Music Performance Rating Scale
G. Interview: Participants' Information Sheet, Consent Form, and Interview Guide
H. Complaints Information Sheet
I. Codebook: Survey Questionnaire
J. Codebook: Music Performance Assessment
K. Codebook: Interview

Note: The title of the thesis has been amended.

A. Ethics Approval: The University of Adelaide

RESEARCH BRANCH
OFFICE OF RESEARCH ETHICS, COMPLIANCE AND INTEGRITY

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CRICOS Provider Number 00123M

6/03/2014

Dr I Green
School: Education

Dear Dr Green

ETHICS APPROVAL No: **H-2014-040**

PROJECT TITLE: **Malaysian Higher Music Education: Personal Environmental Factors Influencing Students' Music Performance Achievement**

The ethics application for the above project has been reviewed by the Low Risk Human Research Ethics Review Group (Faculty of Humanities and Social Sciences and the Faculty of the Professions) and is deemed to meet the requirements of the *National Statement on Ethical Conduct in Human Research (2007)* involving no more than low risk for research participants. You are authorised to commence your research on **06 Mar 2014**.

Ethics approval is granted for three years and is subject to satisfactory annual reporting. The form titled *Project Status Report* is to be used when reporting annual progress and project completion and can be downloaded at http://www.adelaide.edu.au/ethics/human/guidelines/reporting. Prior to expiry, ethics approval may be extended for a further period.

Participants in the study are to be given a copy of the Information Sheet and the signed Consent Form to retain. It is also a condition of approval that you **immediately report** anything which might warrant review of ethical approval including:
serious or unexpected adverse effects on participants,
previously unforeseen events which might affect continued ethical acceptability of the project,
proposed changes to the protocol; and
the project is discontinued before the expected date of completion.

Please refer to the following ethics approval document for any additional conditions that may apply to this project.

Yours sincerely

PROFESSOR RACHEL A. ANKENY
Co-Convenor
Low Risk Human Research Ethics Review Group (Faculty of Humanities and Social Sciences and Faculty of the Professions)

ASSOCIATE PROFESSOR PAUL BABIE
Co-Convenor
Low Risk Human Research Ethics Review Group (Faculty of Humanities and Social Sciences and Faculty of the Professions)

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Applicant: **Dr I Green**

School: **Education**

Project Title: **Malaysian Higher Music Education: Personal Environmental Factors Influencing Students' Music Performance Achievement**

Low Risk Human Research Ethics Review Group (Faculty of Humanities and Social Sciences and the Faculty of the Professions)

ETHICS APPROVAL No: **H-2014-040** **App. No.: 0000017782**

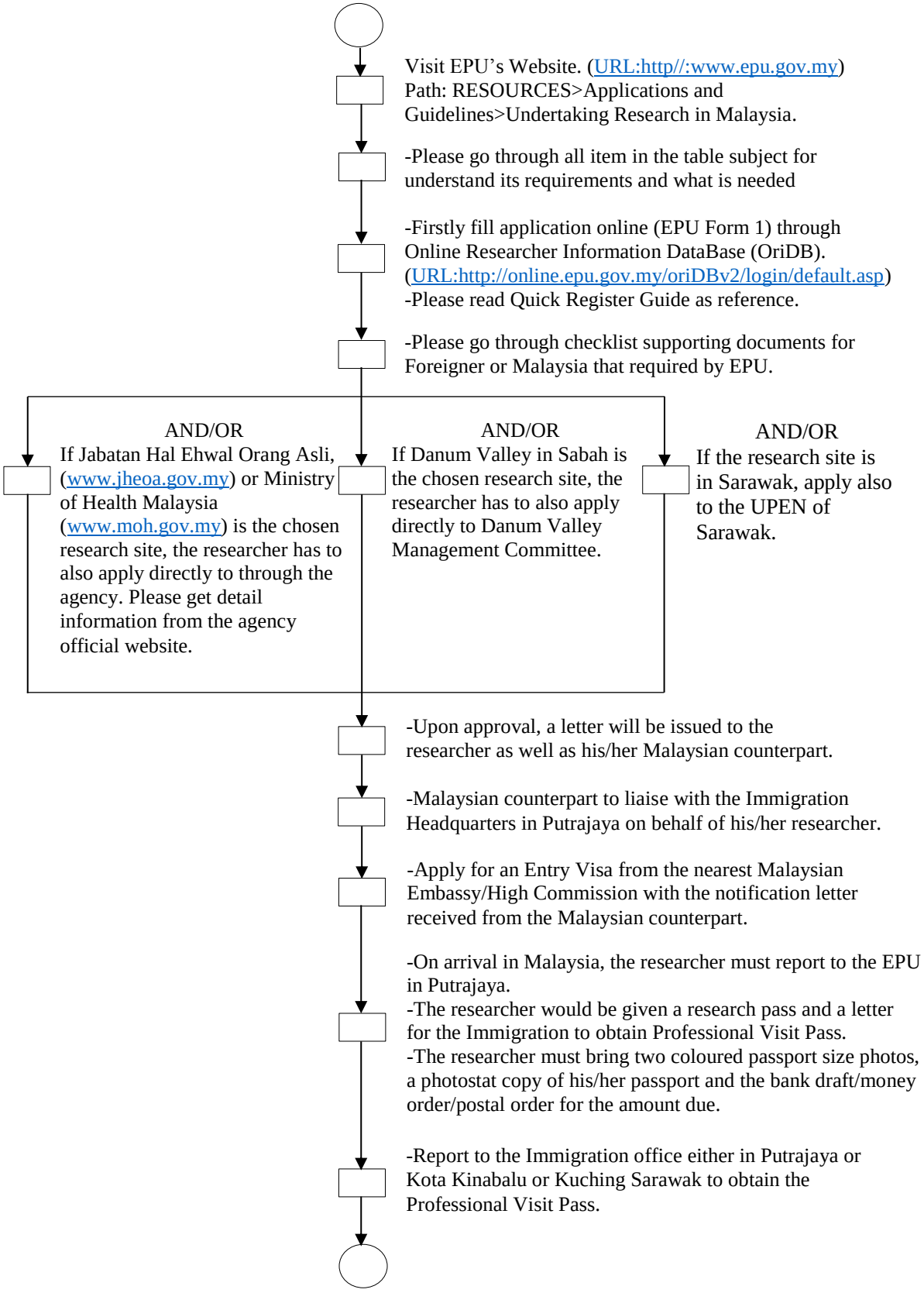
APPROVED for the period: **06 Mar 2014 to 31 Mar 2017**

Thank you for the response dated 4.3.14 to the matters raised. It is noted that this study is to be conducted by Pey Shin Ooi, PhD Candidate.

PROFESSOR RACHEL A. ANKENY
Co-Convenor
Low Risk Human Research Ethics Review Group (Faculty of Humanities and Social Sciences and Faculty of the Professions)

ASSOCIATE PROFESSOR PAUL BABIE
Co-Convenor
Low Risk Human Research Ethics Review Group (Faculty of Humanities and Social Sciences and Faculty of the Professions)

B. Flow Chart of Activities Involved in Applying to Conduct Research in Malaysia



C. Ethics Approval: Malaysian Economic Planning Unit (1)

UNIT PERANCANG EKONOMI
Economic Planning Unit
Jabatan Perdana Menteri
Prime Minister's Department
Block B5 & B6
Pusat Pentadbiran Kerajaan Persekutuan
62502 PUTRAJAYA
MALAYSIA

Telefon : 603-8000 8000

Ruj. Tuan:
Your Ref.:

Ruj. Kami: UPE: 40/200/19/3097
Our Ref.:

Tarikh: 26 February 2014
Date:

OOI PEY SHIN
5/11 , Davaar Place
Adelaide, South Australia
5000 Australia
Email: pey.ooi@adelaide.edu.au

APPLICATION TO CONDUCT RESEARCH IN MALAYSIA

With reference to your application, I am pleased to inform you that your application to conduct research in Malaysia has been *approved* by the **Research Promotion and Co-Ordination Committee, Economic Planning Unit, Prime Minister's Department.** The details of the approval are as follows:

Researcher's name	:	**OOI PEY SHIN**
Passport No./ I.C No	:	**881016-08-6164**
Nationality	:	**MALAYSIA**
Title of Research	:	**"MALAYSIAN HIGHER EDUCATION MUSIC : PERSONEL – ENVIRONMENTAL FACTORS INFLUENCING STUDENT'S INSTRUMENTAL AND VOCAL MUSIC PERFORMANCE ACHIEVEMENT".**
Period of Research Approved	:	**3 YEARS**

2. Please collect your Research Pass in person from the Economic Planning Unit, Prime Minister's Department, Parcel B, Level 4 Block B5, Federal Government Administrative Centre, 62502 Putrajaya, Malaysia and bring along two (2) colour passport size photographs.

3. I would like to draw your attention to the undertaking signed by you that you will submit without cost to the Economic Planning Unit the following documents:

a) A brief summary of your research findings on completion of your research and before you leave Malaysia; and

b) Three (3) copies of your final dissertation/publication.

4. Lastly, please submit a copy of your preliminary and final report directly to the State Government where you carried out your research. Thank you.

Yours sincerely,

(MUNIRAH BT. ABD MANAN)
For Director General,
Economic Planning Unit.
E-mail: munirah@epu.gov.my
Tel: 88882809
Fax: 88883798

ATTENTION

This letter is only to inform you the status of your application and **cannot be used as a research pass.**

D. Ethics Approval: Malaysian Economic Planning Unit (2)

Ooi Pey Shin
5/11, Davaar Place
Adelaide, South Australia
5000 Australia
Email: pey.ooi@adelaide.edu.au

UPE 40/200/19/3097
(5)
19 November 2014

APPLICATION TO CONDUCT RESEARCH IN MALAYSIA

With reference to your application, I am pleased to inform you that your application to conduct research in Malaysia has been approved by the **Research Promotion and Co-Ordination Committee, Economic Planning Unit, Prime Minister's Department.** The details of the approval are as follows:

Researcher's name	:	**OOI PEY SHIN**
Passport No./ I.C No	:	**881016-08-6164**
Nationality	:	**MALAYSIA**
Title of Research	:	**" MALAYSIA HIGHER MUSIC EDUCATION: PERSONAL-ENVIRONMENTAL FACTORS INFLUENCING STUDENTS' MUSIC PERFORMANCE ACHIEVEMENT"**
Period of Research Approved	:	**3 YEARS**

2. Please collect your Research Pass in person from the Economic Planning Unit, Prime Minister's Department, Parcel B, Level 4 Block B5, Federal Government Administrative Centre, 62502 Putrajaya, Malaysia. Bring along **two (2) colour passport size photographs.** Kindly, **get an appointment date from us before you come to collect your research pass.**

3. I would like to draw your attention to the undertaking signed by you that you will submit without cost to the Economic Planning Unit the following documents:

a) A brief summary of your research findings on completion of your research and before you leave Malaysia; and

b) Three (3) copies of your final dissertation/publication.

4. Lastly, please submit a copy of your preliminary and final report directly to the State Government where you carried out your research. Thank you.

Yours sincerely,

(MUNIRAH BT. ABD MANAN)
For Director General,
Economic Planning Unit.
E-mail: munirah@epu.gov.my
Tel: 88882809
Fax: 88883798

ATTENTION

This letter is only to inform you the status of your application and **cannot be used as a research pass.**

E. Survey: Participants' Information Sheet and Survey Questionnaire

Participant's Information Sheet (Survey)

Dear Music Students,

I am Ooi Pey Shin, a PhD candidate from the School of Education, University of Adelaide, Australia. I am carrying out a research project to examine the influence of students' motivation and home learning environment on their music performance achievement within the Malaysian higher education context. The research project title and ethics approval number are as following:

Project Title	:	*Malaysian Higher Music Education: Personal-Environmental Factors Influencing Students' Music Performance Achievement*
Ethics Approval Number	:	*H-2014-040*

As a music student, you undoubtedly have the relevant experiences that will help us to promote and enhance the development of the music education sector. Your participation in this research project will include completing a survey questionnaire and being assessed by the examiner using a separate music performance scoring rubric provided by the researcher during your usual music performance examination in your course requirements. A moderator may be present during your music performance examination upon your permission to assist in assessing to ensure reliability of the assessment. Apart from that, there may also be a 10-15 minutes audio-recorded interview upon your permission.

Your participation in this research project is voluntary. You may choose not to participate, and you may withdraw at anytime during the research project. Your decision to participate in this research will not impact on your studies at this University.

Confidentiality of your identity and responses are assured. Only the investigator (myself) and my supervisors (Dr. Ian Green: ian.green@adelaide.edu.au; Dr. Francisco Ben: francisco.ben@adelaide.edu.au; and Dr. Jennifer Rosevear: jennifer.rosevear@adelaide.edu.au) will have access to the information collected for this research project. However, you will not be individually identified in any way except for the persons mentioned above. Any results obtained will be reported in the form of dissertation, articles and journals with your identity being removed and replaced by a code.

If you have any questions or concerns, please feel free to contact me at the contact details below. You also have the right to express your concerns to my principal supervisor, Dr. Ian Green or the University of Adelaide's Human Research Committee as shown in the attached Complaint Information Sheet.

This survey will take around 20-30 minutes to complete. Thank you for your time and I genuinely appreciate your interest to participate in this research study**. By completing and returning this survey, you are consenting to being involved in this research project.**

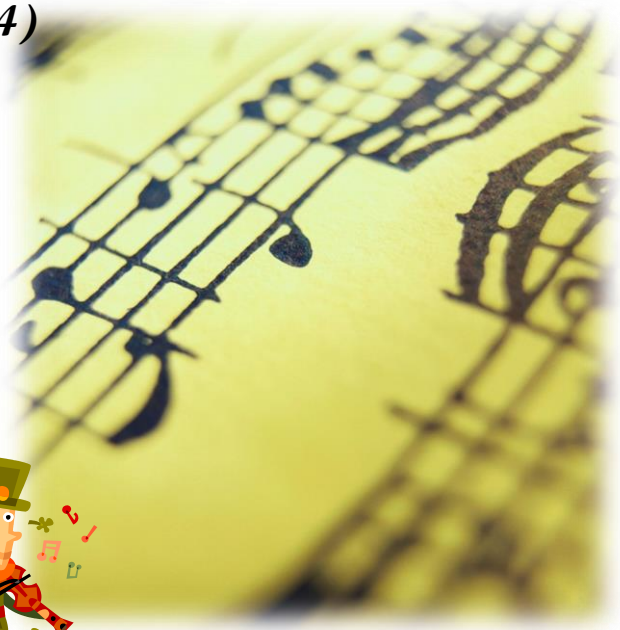
Thank you very much!

Sincerely,
Ooi Pey Shin
Email : pey.ooi@adelaide.edu.au
Phone : +61 425 199 619

Note: A copy of the Information Sheet and Complaint Information Sheet will be given to you.

Music Student Survey Questionnaire

Malaysian Higher Education (2014)



School of Education
Faculty of Humanities and Social Sciences
10 Pulteney Street
The University of Adelaide SA 5005

Dear music students,

Thank you for your interest in participating in this research project as explained in the information sheet.

This survey consists of 4 sections.
Section A : Demographic Information
Section B : Home Music Learning Environment
Section C : Student Attitudes towards Music
Section D : Self-Regulation

General Instructions:
There are two types of questions, open-ended and multiple-choice questions, included in this survey questionnaire.

If there is a space, please write your responses in the space provided. If you need to change your response, cross out the previous response (e.g. ~~mistake~~) and write the new one next to it.

For questions with options provided, please tick your responses in the circle (e.g. ✓) wherever appropriate. If you need to change your response, cross out the previous response (e.g. ×) and tick your new response.

There is no right or wrong answer.

Please ensure you indicate your response clearly and **it is important that you respond to *every question***.
Thank you very much for your understanding and co-operation.

Your time is greatly appreciated! ☺☺☺

Sincerely,
Ooi Pey Shin

Please write your response in the space provided. If you need to change your response, cross out the previous response (e.g. ~~mistake~~) and write the new one next to it.

For questions with options provided, please tick your response (e.g. ✓) wherever appropriate. If you need to change your response, cross out the previous response (e.g. ×) and tick your new response.

A. Demographic Information

Name : _____

Age : _____

1. What is your gender?

◯ Male ◯ Female

2. What music degree programme are you enrolled in? (e.g. Bachelor of Music Education)

_____

3. What year level are you in? (e.g. First Year)

_____

4. What is the main musical instrument you play?

_____

5. How many years have you been playing your main musical instrument?

_____

6. How many other musical instruments do you know how to play?

_____

7. How many hours do you practice per day on average?

_____

8. What was your highest qualification for music performance before entering university? (e.g. Trinity Grade 8)

_____

9. In the past 10 years, how often did you perform in musical concerts on average?

◯ None
◯ Less than once a year
◯ Once a year
◯ More than once a year

10. In the past 10 years, how often did you enter musical performance competitions on average?

◯ None
◯ Less than once a year
◯ Once a year
◯ More than once a year

11. What is your father's/male guardian's highest level of education?

◯ Pre-primary education
◯ Primary education
◯ Secondary education
◯ Diploma/certificate
◯ Bachelor/honours degree
◯ Master/PhD degree
◯ Others, please specify: _____

12. What is your mother's/female guardian's highest level of education?

◯ Pre-primary education
◯ Primary education
◯ Secondary education
◯ Diploma/certificate
◯ Bachelor/honours degree
◯ Master/PhD degree
◯ Others, please specify: _____

13. What is your father's/male guardian's occupation?

_____

14. What is your mother's/female guardian's occupation?

_____

B. Home Learning Environment

Do you have the following items at home?

		Yes	No
1.	Metronome (including downloaded application on smart phones)	◯	◯
2.	Music books (including music scores)	◯	◯
3.	Musical instrument(s) other than the main musical instrument you play	◯	◯
4.	Video or audio recorder	◯	◯
5.	Music player (e.g. mp3 player, radio, computer, iPod)	◯	◯
6.	Music software (e.g. Sibelius, Audacity)	◯	◯
7.	Music recordings (e.g. CD, DVD, mp3)	◯	◯
8.	Own music practice room	◯	◯

Does either one or both of ***your parents/guardians*** have the following musical background?

		Yes	No
1.	Know how to play at least one musical instrument (including singing)	○	○
2.	Play in a musical group or orchestra	○	○
3.	Work in the music industry (e.g. Sony Music Entertainment)	○	○
4.	Have a music performance certificate or music degree	○	○
5.	Perform in musical concerts	○	○

How often did either one or both of your parents/guardians do the following activities ***when you were young***?

		Never	Some-times	Almost Always	Always
1.	Sing with you	①	②	③	④
2.	Play musical instrument with you	①	②	③	④
3.	Talk about music with you	①	②	③	④
4.	Listen to music recordings with you at home	①	②	③	④
5.	Ask about your music learning process	①	②	③	④
6.	Listen to your music practice sessions	①	②	③	④
7.	Take you to musical concerts	①	②	③	④
8.	Attend your music rehearsals	①	②	③	④
9.	Attend your musical concerts	①	②	③	④
10.	Record your music performance	①	②	③	④
11.	Provide transport to your musical activities	①	②	③	④
12.	Provide you money for musical activities and materials	①	②	③	④

How often does either one or both of your parents/guardians do the following activities ***now***?

		Never	Some-times	Almost Always	Always
1.	Ask about your music learning process	①	②	③	④
2.	Listen to your music practice sessions	①	②	③	④
3.	Attend your music rehearsals	①	②	③	④
4.	Attend your musical concerts	①	②	③	④
5.	Record your music performance	①	②	③	④
6.	Provide transport to your musical activities	①	②	③	④
7.	Provide you money for musical activities and materials	①	②	③	④

C. Student Attitudes towards Music

How much do you disagree or agree with the following statements?

		Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1.	I am satisfied with how well I do in my music degree	①	②	③	④	⑤
2.	I learn things in music quickly	①	②	③	④	⑤
3.	Compared to my classmates, I am good at music	①	②	③	④	⑤
4.	I can never achieve good marks in music even if I work hard	①	②	③	④	⑤
5.	I usually get good marks in music	①	②	③	④	⑤
6.	Work in music is easy for me	①	②	③	④	⑤
1.	Music performance is not too difficult for me	①	②	③	④	⑤
2.	I believe I can become very good at playing my musical instrument	①	②	③	④	⑤
3.	When I set music performing goals for myself, I am sure I can achieve them	①	②	③	④	⑤
4.	I expect to be known as a good music performer	①	②	③	④	⑤
5.	I feel I can solve any musical problem I meet	①	②	③	④	⑤
6.	I am confident in my ability to improve on my music playing	①	②	③	④	⑤
1.	I only practice when I have to perform music	①	②	③	④	⑤
2.	I like talking about music with other people	①	②	③	④	⑤
3.	I enjoy learning new musical pieces	①	②	③	④	⑤
4.	I enjoy going to musical concerts	①	②	③	④	⑤
5.	I like to practice difficult musical pieces	①	②	③	④	⑤
6.	I enjoy the challenges in my music practice sessions	①	②	③	④	⑤
1.	Working hard in music is important to help me get the job I want	①	②	③	④	⑤
2.	I would like to spend all my future life working in music related job	①	②	③	④	⑤
3.	I study music because I know it is useful for me	①	②	③	④	⑤
4.	If I can play music better I will be able to get a better job	①	②	③	④	⑤

		Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5.	I want to do well in music because this will show my ability to others	①	②	③	④	⑤
6.	Doing well in music will give me chance to perform in different countries	①	②	③	④	⑤

D. Self-Regulation

How often do you do the following when you are practicing your musical pieces?

		Never	Some-times	Almost Always	Always
1.	I select important technical and musical parts repeat practicing them over and over again	①	②	③	④
2.	I spend more time practicing difficult sections	①	②	③	④
3.	When I practice, I try to find the most important musical ideas	①	②	③	④
4.	I carefully look through a new musical piece before practising	①	②	③	④
5.	I begin each practice sessions with warm-ups	①	②	③	④
6.	I use what I have learned in the past to practice new musical pieces	①	②	③	④
7.	I make connections between my understanding from listening to music and from teachers	①	②	③	④
8.	I mark difficult parts in music when practicing	①	②	③	④
9.	I practice difficult parts using different methods	①	②	③	④
1.	I set specific practice goals	①	②	③	④
2.	When I find a musical piece is difficult, I give up practicing it	①	②	③	④
3.	I practice difficult music even I am not asked to do so	①	②	③	④
4.	I spend some practice time to sight read new music	①	②	③	④

How often do you do the following?

		Never	Some-times	Almost Always	Always
1.	I try to get one section of music perfect before practicing the next section	①	②	③	④
2.	I think about musical pieces I practice by singing the music in my mind	①	②	③	④
3.	If I cannot play a musical piece correctly, I stop to think about how it should sound	①	②	③	④
4.	I practice to see how much better I can actually get at music	①	②	③	④
5.	When I have problem with a difficult section, I try to think about the best way to work out the problem	①	②	③	④
1.	I can only concentrate for short periods of time when practicing	①	②	③	④
2.	I find it hard to stick to a practice schedule	①	②	③	④
3.	I am easily distracted when practicing	①	②	③	④
4.	I think about things not related to music when I practice	①	②	③	④
5.	It is easy for me to focus on my music when I am practicing alone	①	②	③	④
1.	I ask my teacher for help when practicing difficult music	①	②	③	④
2.	I use my teacher's advice when practicing	①	②	③	④
3.	I ask my classmates for help when I have problem learning the music	①	②	③	④
4.	I often rehearse by performing music for a classmate or a friend	①	②	③	④
5.	I listen to musical recordings to help me learn	①	②	③	④
6.	I look up books for musical information to help me learn	①	②	③	④

I am happy to be contacted for an interview to discuss my experience further:

◯ Yes ◯ No

If Yes, please provide the following details

Name : _____

Phone : _____

Email : _____

Thank you ♫♫

F. Assessment: Participants' Information Sheet and Music Performance Rating Scale

Participant's Information Sheet (Assessment)

Dear Examiners,

I am Ooi Pey Shin, a PhD candidate from the School of Education, University of Adelaide, Australia. I am carrying out a research project to examine the influence of students' motivation and home learning environment on their music performance achievement within the Malaysian higher education context. The research project title and ethics approval number are as following:

Project Title	:	*Malaysian Higher Music Education: Personal-Environmental Factors Influencing Students' Music Performance Achievement*
Ethics Approval Number	:	*H-2014-040*

As an examiner of music performance, you undoubtedly have the relevant experiences that will help us to promote and enhance the development of the music education sector. To serve the purpose of this research project, students' music performance assessment results that are comparative across different Malaysian universities is needed. Hence, your assistance in using music performance scoring rubric provided to assess students' music performance apart from your usual assessment process as required by your university will be greatly appreciated. A moderator may be present to assess the students apart from you under random circumstance to assist in ensuring reliability of the assessment.

Your participation in this research project is voluntary. You may choose not to participate, and you may withdraw at anytime during the assessment process. Your decision to participate in this research will not impact on your work position at this University.

Confidentiality of your identity and responses are assured. Only the investigator (myself) and my supervisors (Dr. Ian Green: ian.green@adelaide.edu.au; Dr. Francisco Ben: francisco.ben@adelaide.edu.au; and Dr. Jennifer Rosevear: jennifer.rosevear@adelaide.edu.au) will have access to the information collected from the assessment. However, you will not be individually identified in any way except for the persons mentioned above. Any results obtained will be reported in the form of dissertation, articles and journals with your identity being removed and replaced by a code.

If you have any questions or concerns, please feel free to contact me at the contact details below. You also have the right to express your concerns to my principal supervisor, Dr. Ian Green or the University of Adelaide's Human Research Committee as shown in the attached Complaint Information Sheet.

The assessment process will take around 5 minutes to complete. Thank you for your time and I genuinely appreciate your interest to participate in this research study**. By completing and returning the music performance scoring rubric, you are consenting to being involved in this research project.**

Thank you very much!

Sincerely,
Ooi Pey Shin
Email : pey.ooi@adelaide.edu.au
Phone : +61 425 199 619

Note: A copy of the Information Sheet and Complaint Information Sheet will be given to you.

Music Performance Assessment Report

Student:		**Instrument:**						**Year Level:**			
		Generally Inadequate		Minimal Competency		Satisfactory		Excellent		Highly Proficient	
Perceived Instrumental Competence											
Accuracy	Secure control of notes, tempo, pulse, rhythm, pitch and intonation	1	2	3	4	5	6	7	8	9	10
Technical Aspects	Fluency of performance and clarity of articulation	1	2	3	4	5	6	7	8	9	10
Sound Quality	Control of tonal quality, colour and dynamic range	1	2	3	4	5	6	7	8	9	10
Musicality											
Stylistic Accuracy	Understanding the style/genre of the work(s)	1	2	3	4	5	6	7	8	9	10
Interpretive Imagination	Incorporation of musical creativity and individuality	1	2	3	4	5	6	7	8	9	10
Expressive Range	Musical sensitivity including appropriate use of phrasing and expressive dynamic level	1	2	3	4	5	6	7	8	9	10
Communication											
Deportment on Stage	Confident performance and professional appearance	1	2	3	4	5	6	7	8	9	10
Deportment with Instrument	Appropriate posture and demonstration of control over instrument	1	2	3	4	5	6	7	8	9	10
Audience Communication	Demonstration of emotional commitment and conviction that engages the audiences	1	2	3	4	5	6	7	8	9	10
Examiner Signature:								**Date:**			

*Please see next page for descriptors.

Descriptors

Generally Inadequate
Work which is **incomplete**, displays an **inadequate** understanding of the subject matter and an **inadequate** grasp of relevant skills.
Minimal Competency
Work which meets **minimal requirements**, displays a **basic** understanding of most of the subject matter and a **basic** grasp of relevant skills.
Satisfactory
Work of **satisfactory quality**, which displays a **moderate level** of understanding of the subject matter and a **moderate** grasp of relevant skills.
Excellent
Work of **good quality**, which demonstrates a **thorough** knowledge and understanding of the subject matter, **proficiency** in relevant skills, and analytical and conceptual ability of a **higher order**.
Highly proficient
Work of **exceptional quality**, which demonstrates **comprehensive** understanding of the subject matter, **mastery** of relevant skills, **sophisticated or original** critical and conceptual analysis and interpretation, and **outstanding** quality in clarity, precision and presentation of work.

G. Interview: Participants' Information Sheet, Consent Form, and Interview Guide

Participant's Information Sheet (Interview)

Dear Participants,

I am Ooi Pey Shin, a PhD candidate from the School of Education, University of Adelaide, Australia. I am carrying out a research project to examine the influence of students' motivation and home learning environment on their music performance achievement within the Malaysian higher education context. The research project title and ethics approval number are as following:

Project Title	:	*Malaysian Higher Music Education: Personal-Environmental Factors Influencing Students' Music Performance Achievement*
Ethics Approval Number	:	*H-2014-040*

You are being contacted to participate in this interview based on your interest as indicated in the survey completed by you previously. This interview is a follow-up study of the survey. A few questions will be asked during the interview to further understand students' motivation and their home learning environment in relation to their music performance achievement. Your responses in this interview can greatly contribute to the advancement of the music education. With your permission, we would also like to obtain your music performance examination results for this research project.

Your participation in this research project is voluntary. You may choose not to participate, and you may withdraw at anytime during the interview session. Your decision to whether participate or not in this research will not impact on your assessments or studies at this University.

Confidentiality of your identity and responses are assured. Only the investigator (myself) and my supervisors (Dr. Ian Green: ian.green@adelaide.edu.au; Dr. Francisco Ben: francisco.ben@adelaide.edu.au; and Dr. Jennifer Rosevear: jennifer.rosevear@adelaide.edu.au) will have access to the information collected from the interview. However, you will not be individually identified in any way except for the persons mentioned above. Any results obtained will be reported in the form of dissertation, articles and journals with your identity being removed and replaced by a code.

If you have any questions or concerns, please feel free to contact me at the contact details below. You also have the right to express your concerns to my principal supervisor, Dr. Ian Green or the University of Adelaide's Human Research Committee as shown in the attached Complaint Information Sheet.

This is a 10-15 minutes interview. The interview will be audio-recorded upon your permission. Thank you for your time and I genuinely appreciate your interest to participate in this research study**. Please read and sign the Consent Form on next page**.

Thank you very much!

Sincerely,
Ooi Pey Shin
Email : pey.ooi@adelaide.edu.au
Phone : +61 425 199 619

Note: A copy of the Information Sheet, Consent Form and Complaint Information Sheet will be given to you.

Consent Form (Interview)

1. I have been informed the purpose of the research project and agree to take part in the following research project:

Project Title	:	*Malaysian Higher Music Education: Personal-Environmental Factors Influencing Students' Music Performance Achievement*
Ethics Approval Number	:	*H-2014-040*

2. I have had the project, so far as it affects me, fully explained to my satisfaction by the research worker. My consent is given freely.

3. Although I understand the purpose of the research project, it has also been explained that involvement may not be any benefit to me.

4. I have been informed that, while information gained during the study may be published, I will not be identified and my personal results will not be divulged.

5. I understand that I am free to withdraw from the project at any time and that this will not affect my study at the University now or in the future.

6. I agree to the interview being audio recorded. ☐ Yes ☐ No

7. I am aware that information gained from me for the research project includes my responses to the survey questionnaire, my responses during the interview, and my music performance examination results.

8. I am aware that I should keep a copy of this Consent Form, when completed, and the attached Information Sheet.

Participant:
I have read the above information and I understand it.

Name : _____

Signature : _____

Date : _____

Researcher:

_____

Ooi Pey Shin
Email : pey.ooi@adelaide.edu.au
Phone : +61 425 199 619

Interview Protocol

Date	:
Time	:
Venue	:
Interviewee	:
Interviewer	:
Interviewee's Demographic Information:	

Checklist:
○ Describe the purpose of the research project to the interviewee
○ Describe what will be done with the data to protect interviewee's confidentiality
○ Indicate how long the interview will take
○ Have the interviewee read and sign the consent form
○ Turn on the audio recorder

Questions:
1. What got you started learning music?
2. Do you feel that your parents have played an important role in your music learning journey?
3. How do you think your parents influenced your music learning motivation?
4. How do you feel about your current achievement in music?
5. Do you feel that your parents have an influence on your music achievement?

* Thank the interviewee for his/her co-operation and participation in this interview. Again, assure him/her of the confidentiality of his/her responses.

H. Complaints Information Sheet

Contacts for Information on Project and Independent Complaints Procedure

The following research project has been reviewed and approved by the University of Adelaide Human Research Ethics Committee:

Project Title: *Malaysian Higher Music Education: Personal-Environmental Factors Influencing Students' Music Performance Achievement*
Ethics Approval Number: *H-2014-040*

The Human Research Ethics Committee monitors all the research projects which it has approved. The committee considers it important that people participating in approved projects have an independent and confidential reporting mechanism which they can use if they have any worries or complaints about that research.

This research project will be conducted according to the NHMRC National Statement on Ethical Conduct in Human Research (see http://www.nhmrc.gov.au/publications/synopses/e72syn.htm).

1. If you have questions or problems associated with the practical aspects of your participation in the project, or wish to raise a concern or complaint about the project, then you should consult the project co-ordinator:

Name	**:**	Dr. Ian Green Ooi Pey Shin
Phone	**:**	(+61) 438 756 936 (+61) 425 199 619
Email	**:**	ian.green@adelaide.edu.au pey.ooi@adelaide.edu.au

2. If you wish to discuss with an independent person matters related to
   - Making a complaint, or
   - Raising concerns on the conduct of the project, or
   - The University policy on research involving human participants, or
   - Your rights as a participant,

   Contact the Human Research Ethics Committee's Secretariat on the phone (+61) 8 8313 6028 or by email to hrec@adelaide.edu.au

Sincerely,
Ooi Pey Shin (Researcher)

I. Codebook: Survey Questionnaire

Code	Code Label	Value	Value Label
Section A: Demographic Information			
A1 – Demographic Information			
StudID	Student ID	-	(Number)
StudName	Student name	-	(Alphabet)
SchID	School ID	-	(Number)
SchName	School name	-	(Alphabet)
Age	Age	-	(Number)
Gender	Gender	0	Male
		1	Female
A2 – Level of Expertise			
Prog	Music degree programme enrolled	1	Music Performance
		2	Music Education
		3	Music Com & Arr
ProgYr	Year level	-	(Number)
Inst	Principal instrument	1	Keyboard
		2	Strings
		3	Woodwinds
		4	Brass
		5	Vocal
		6	Percussions
InstYr	Total years playing the principal instrument	-	(Number)
OthInst	Number of other instruments known how to play	-	(Number)
PracHour	Number of practice hours per day on average	-	(Number)
QuaGrd	Highest level of music performance qualification before entering university	-	(Number)
PerfExp	Frequency of performing in musical concerts in the past ten years on average	1	None
		2	Less than once a year
		3	Once a year
		4	More than once a year
PerfCom	Frequency of entering music performance competitions in the past ten years on average	1	None
		2	Less than once a year
		3	Once a year
		4	More than once a year
A3 – Family Socio-Economic Status			
FEduc	Father's highest level of education	1	Pre-Primary Education
		2	Primary Education
		3	Secondary Education
		4	Diploma/Certificate
		5	Bachelor/Honours
		6	Master/PhD
		7	Others

MEduc	Mother's highest level of education	1 2 3 4 5 6 7	Pre-Primary Education Primary Education Secondary Education Diploma/Certificate Bachelor/Honours Master/PhD Others
FOcc	Father's occupation	-	(Alphabet)
MOcc	Mother's occupation	-	(Alphabet)
Section B: Home Learning Environment			
B1 – Home Musical Possessions			
Poss1	Metronome (including downloaded application on smart phones)	0 1	No Yes
Poss2	Music books (including music scores)	0 1	No Yes
Poss3	Musical instrument(s) other than the main musical instrument you play	0 1	No Yes
Poss4	Video or audio recorder	0 1	No Yes
Poss5	Music player (e.g. Mp3 player, radio, computer, iPod)	0 1	No Yes
Poss6	Music software (e.g. Sibelius, Audacity)	0 1	No Yes
Poss7	Music recordings (e.g. CD, DvD, Mp3)	0 1	No Yes
Poss8	Own music practice room	0 1	No Yes
B2 – Parents' Musical Background			
PBcg1	Know how to play at least one musical instrument (including singing)	0 1	No Yes
PBcg2	Play in a musical group or orchestra	0 1	No Yes
PBcg3	Work in the music industry (e.g. Sony Music Entertainment)	0 1	No Yes
PBcg4	Have a music performance certificate or music degree	0 1	No Yes
PBcg5	Perform in musical concerts	0 1	No Yes
B3 – Early Parental Involvement			
PInvE1	Sing with you	1 2 3 4	Never Sometimes Almost Always Always
PInvE2	Play musical instrument with you	1 2 3 4	Never Sometimes Almost Always Always

PInvE3	Talk about music with you	1 2 3 4	Never Sometimes Almost Always Always
PInvE4	Listen to music recordings with you at home	1 2 3 4	Never Sometimes Almost Always Always
PInvE5	Ask about your music learning process	1 2 3 4	Never Sometimes Almost Always Always
PInvE6	Listen to your music practice sessions	1 2 3 4	Never Sometimes Almost Always Always
PInvE7	Take you to musical concerts	1 2 3 4	Never Sometimes Almost Always Always
PInvE8	Attend your music rehearsals	1 2 3 4	Never Sometimes Almost Always Always
PInvE9	Attend your musical concerts	1 2 3 4	Never Sometimes Almost Always Always
PInvE10	Record your music performance	1 2 3 4	Never Sometimes Almost Always Always
PInvE11	Provide transport to your musical activities	1 2 3 4	Never Sometimes Almost Always Always
PInvE12	Provide you money for musical activities and materials	1 2 3 4	Never Sometimes Almost Always Always
B4 – Current Parental Involvement			
PInvC1	Ask about your music learning process	1 2 3 4	Never Sometimes Almost Always Always
PInvC2	Listen to your music practice sessions	1 2 3 4	Never Sometimes Almost Always Always

PInvC3	Attend your music rehearsals	1 2 3 4	Never Sometimes Almost Always Always
PInvC4	Attend your musical concerts	1 2 3 4	Never Sometimes Almost Always Always
PInvC5	Record your music performance	1 2 3 4	Never Sometimes Almost Always Always
PInvC6	Provide transport to your music activities	1 2 3 4	Never Sometimes Almost Always Always
PInvC7	Provide you money for musical activities and materials	1 2 3 4	Never Sometimes Almost Always Always
Section C: Student Attitudes towards Music			
C1 – Self-Concept			
SelCon1	I am satisfied with how well I do in my music degree	1 2 3 4 5	Strongly Disagree Disagree Not Sure Agree Strongly Agree
SelCon2	I learn things in music quickly	1 2 3 4 5	Strongly Disagree Disagree Not Sure Agree Strongly Agree
SelCon3	Compared to my classmates, I am good at music	1 2 3 4 5	Strongly Disagree Disagree Not Sure Agree Strongly Agree
SelCon4*	I can never achieve good marks in music even if I work hard	1 2 3 4 5	Strongly Disagree Disagree Not Sure Agree Strongly Agree
SelCon5	I usually get good marks in music	1 2 3 4 5	Strongly Disagree Disagree Not Sure Agree Strongly Agree

SelCon6	Work in music is easy for me	1 2 3 4 5	Strongly Disagree Disagree Not Sure Agree Strongly Agree
C2 – Self-Efficacy			
SelEff1	Music performance is not too difficult for me	1 2 3 4 5	Strongly Disagree Disagree Not Sure Agree Strongly Agree
SelEff2	I believe I can become very good at playing my musical instrument	1 2 3 4 5	Strongly Disagree Disagree Not Sure Agree Strongly Agree
SelEff3	When I set music performing goals for myself, I am sure I can achieve them	1 2 3 4 5	Strongly Disagree Disagree Not Sure Agree Strongly Agree
SelEff4	I expect to be known as a good music performer	1 2 3 4 5	Strongly Disagree Disagree Not Sure Agree Strongly Agree
SelEff5	I feel I can solve any musical problem I meet	1 2 3 4 5	Strongly Disagree Disagree Not Sure Agree Strongly Agree
SelEff6	I am confident in my ability to improve on my music playing	1 2 3 4 5	Strongly Disagree Disagree Not Sure Agree Strongly Agree
C3 – Personal Interest			
PerInt1*	I only practice when I have to perform music	1 2 3 4 5	Strongly Disagree Disagree Not Sure Agree Strongly Agree
PerInt2	I like talking about music with other people	1 2 3 4 5	Strongly Disagree Disagree Not Sure Agree Strongly Agree

PerInt3	I enjoy learning new musical pieces	1	Strongly Disagree
		2	Disagree
		3	Not Sure
		4	Agree
		5	Strongly Agree
PerInt4	I enjoy going to musical concerts	1	Strongly Disagree
		2	Disagree
		3	Not Sure
		4	Agree
		5	Strongly Agree
PerInt5	I like to practice difficult musical pieces	1	Strongly Disagree
		2	Disagree
		3	Not Sure
		4	Agree
		5	Strongly Agree
PerInt6	I enjoy the challenges in my music practice sessions	1	Strongly Disagree
		2	Disagree
		3	Not Sure
		4	Agree
		5	Strongly Agree
C4 – Perceived Value			
PerVal1	Working hard in music is important to help me get the job I want	1	Strongly Disagree
		2	Disagree
		3	Not Sure
		4	Agree
		5	Strongly Agree
PerVal2	I would like to spend all my future life time working in music related job	1	Strongly Disagree
		2	Disagree
		3	Not Sure
		4	Agree
		5	Strongly Agree
PerVal3	I study music because I know it is useful for me	1	Strongly Disagree
		2	Disagree
		3	Not Sure
		4	Agree
		5	Strongly Agree
PerVal4	If I can play music better I will be able to get a better job	1	Strongly Disagree
		2	Disagree
		3	Not Sure
		4	Agree
		5	Strongly Agree
PerVal5	I want to do well in music because this will show my ability to others	1	Strongly Disagree
		2	Disagree
		3	Not Sure
		4	Agree
		5	Strongly Agree

PerVal6	Doing well in music will give me chance to perform in different countries	1 2 3 4 5	Strongly Disagree Disagree Not Sure Agree Strongly Agree
Section D: Self-Regulation			
D1 – Method			
SRegM1	I select important technical and musical parts repeat practicing them over and over again	1 2 3 4	Never Sometimes Almost Always Always
SRegM2	I spend more time practicing difficult sections	1 2 3 4	Never Sometimes Almost Always Always
SRegM3	When I practice, I try to find the most important musical ideas	1 2 3 4	Never Sometimes Almost Always Always
SRegM4	I carefully look through a new musical piece before practicing	1 2 3 4	Never Sometimes Almost Always Always
SRegM5	I begin each practice sessions with warm-ups	1 2 3 4	Never Sometimes Almost Always Always
SRegM6	I use what I have learned in the past to practice new musical pieces	1 2 3 4	Never Sometimes Almost Always Always
SRegM7	I make connections between my understanding from listening to music and from teachers	1 2 3 4	Never Sometimes Almost Always Always
SRegM8	I mark difficult parts in music when practicing	1 2 3 4	Never Sometimes Almost Always Always
SRegM9	I practice difficult parts using different methods	1 2 3 4	Never Sometimes Almost Always Always
SRegM10	I set specific practice goals	1 2 3 4	Never Sometimes Almost Always Always

SRegM11*	When I find a musical piece is difficult, I give up practicing it	1 2 3 4	Never Sometimes Almost Always Always
SRegM12	I practice difficult music even I am not asked to do so	1 2 3 4	Never Sometimes Almost Always Always
SRegM13	I spend some practice time to sight read new music	1 2 3 4	Never Sometimes Almost Always Always
D2 – Behaviour			
SRegB1	I try to get one section of music perfect before practicing the next section	1 2 3 4	Never Sometimes Almost Always Always
SRegB2	I think about musical pieces I practice by singing the music in my mind	1 2 3 4	Never Sometimes Almost Always Always
SRegB3	If I cannot play a musical piece correctly, I stop to think about how it should sound	1 2 3 4	Never Sometimes Almost Always Always
SRegB4	I practice to see how much better I can actually get at music	1 2 3 4	Never Sometimes Almost Always Always
SRegB5	When I have problem with difficult section, I try to think the best way to work out the problem	1 2 3 4	Never Sometimes Almost Always Always
D3 – Time Management			
SRegTM1*	I can only concentrate for short periods of time when practicing	1 2 3 4	Never Sometimes Almost Always Always
SRegTM2*	I find it hard to stick to a practice schedule	1 2 3 4	Never Sometimes Almost Always Always
SRegTM3*	I am easily distracted when practice	1 2 3 4	Never Sometimes Almost Always Always

SRegTM4*	I think about things not related to music when I practice	1 2 3 4	Never Sometimes Almost Always Always
SRegTM5	It is easy for me to focus on my music when I am practicing alone	1 2 3 4	Never Sometimes Almost Always Always
D4 – Help Seeking			
SRegHS1	I ask teacher for help when practicing difficult music	1 2 3 4	Never Sometimes Almost Always Always
SRegHS2	I use my teacher's advice when practicing	1 2 3 4	Never Sometimes Almost Always Always
SRegHS3	I ask my classmates for help when I have problem learning the music	1 2 3 4	Never Sometimes Almost Always Always
SRegHS4	I often rehearse by performing music for a classmate or a friend	1 2 3 4	Never Sometimes Almost Always Always
SRegHS5	I listen to musical recordings to help me learn	1 2 3 4	Never Sometimes Almost Always Always
SRegHS6	I look up books for musical information to help me learn	1 2 3 4	Never Sometimes Almost Always Always

* Negative item

J. Codebook: Music Performance Assessment

Code	Code Label	Value	Value Label
Perceived Instrumental Competence			
IC1	Accuracy: Secure control of notes, tempo, pulse, rhythm, pitch and intonation	1	Generally Inadequate
		2	Generally Inadequate
		3	Minimal
		4	Competency
		5	Minimal
		6	Competency
		7	Satisfactory
		8	Satisfactory
		9	Excellent
		10	Excellent
			Highly Proficient
			Highly Proficient
IC2	Technical aspects: Fluency of performance and clarity of articulation	1	Generally Inadequate
		2	Generally Inadequate
		3	Minimal
		4	Competency
		5	Minimal
		6	Competency
		7	Satisfactory
		8	Satisfactory
		9	Excellent
		10	Excellent
			Highly Proficient
			Highly Proficient
IC3	Sound quality: Control of tonal quality, colour and dynamic range	1	Generally Inadequate
		2	Generally Inadequate
		3	Minimal
		4	Competency
		5	Minimal
		6	Competency
		7	Satisfactory
		8	Satisfactory
		9	Excellent
		10	Excellent
			Highly Proficient
			Highly Proficient
Musicality			

M1	Stylistic accuracy: Understanding the style/genre of the work(s)	1 2 3 4 5 6 7 8 9 10	Generally Inadequate Generally Inadequate Minimal Competency Minimal Competency Satisfactory Satisfactory Excellent Excellent Highly Proficient Highly Proficient
M2	Interpretive imagination: Incorporation of musical creativity and individuality	1 2 3 4 5 6 7 8 9 10	Generally Inadequate Generally Inadequate Minimal Competency Minimal Competency Satisfactory Satisfactory Excellent Excellent Highly Proficient Highly Proficient
M3	Expressive range: Musical sensitivity including appropriate use of phrasing and expressive dynamic level	1 2 3 4 5 6 7 8 9 10	Generally Inadequate Generally Inadequate Minimal Competency Minimal Competency Satisfactory Satisfactory Excellent Excellent Highly Proficient Highly Proficient
Communications			
C1	Deportment on stage: Confident performance and professional appearance	1 2 3 4 5 6 7 8 9 10	Generally Inadequate Generally Inadequate Minimal Competency Minimal Competency Satisfactory Satisfactory Excellent Excellent Highly Proficient Highly Proficient

C2	Deportment with instrument: Appropriate posture and demonstration of control over instrument	1 2 3 4 5 6 7 8 9 10	Generally Inadequate Generally Inadequate Minimal Competency Minimal Competency Satisfactory Satisfactory Excellent Excellent Highly Proficient Highly Proficient
C3	Audience communication: Demonstration of emotional commitment and conviction that engages the audiences	1 2 3 4 5 6 7 8 9 10	Generally Inadequate Generally Inadequate Minimal Competency Minimal Competency Satisfactory Satisfactory Excellent Excellent Highly Proficient Highly Proficient

K. Codebook: Interview

Students' Motivation		
Code	:	SelCon
Brief definition	:	Self-concept
Full definition	:	Students' self-perception on their ability in general music learning.
When to use	:	This code is used when students mention about their ability in general music learning. This includes their perceptions about how successful they are in music learning, how they think in comparison to others (i.e., peers) and whether music learning is difficult for them.
When not to use	:	Do not use this code when students specifically mention about their ability in relation to music performing skills. Please refer to SelEff.
Code	:	SelEff
Brief definition	:	Self-efficacy
Full definition	:	Students' self-perception on their ability to perform music.
When to use	:	This code is used when students mention about their ability associated with music performance in specific.
When not to use	:	Do not use this code when students mention about their ability other than music performance. Please refer SelCon.
Code	:	PerInt
Brief definition	:	Personal interest
Full definition	:	Students' personal interest in music.
When to use	:	Use this code when students mention that they enjoy learning music, love music and exhibit interest in music.
When not to use	:	Do not use this code when students' interest in music is related to external rewards (i.e., students enjoy learning music because this gives them the opportunities to travel to other countries). Please refer to PerVal.
Code	:	PerVal
Brief definition	:	Perceived values
Full definition	:	Students' perceived values of music for external rewards (i.e., future career).
When to use	:	Use this code when students mention that they are motivated to learn music because of external rewards such as obtaining a music-related career and receive compliments from others (i.e., teachers, peers and family members).
When not to use	:	Do not use this code when the motivation to learn music is inherently rewarded for own pleasure. Please refer to PerInt.
Code	:	SelReg
Brief definition	:	Self-regulated practice behaviour
Full definition	:	Students' music learning strategies used during practice including cognitive strategies, metacognitive strategies, adaptive learning strategies and resource management used by students to achieve goals of learning.
When to use	:	This code is used when students mention about their practising strategies to overcome difficulties they encounter and improve their musical skills. Practising strategies include methods they use to practice, self-evaluation of their own learning process, how they manage their practice time and how they seek for help.

Family Factors		
Code	:	FamBcg
Brief definition	:	Family's musical background.
Full definition	:	Students who have family members (i.e., parents, siblings and relatives) with musical background.
When to use	:	This code applies to students family members who know how to play at least one musical instrument or sing professionally (i.e., sing in a choir), have jobs related to music (i.e., music teacher),
When not to use	:	This code does not apply to family members who accompany participants to attend music classes.
Code	:	FamSupt
Brief definition	:	Family's support to students' music learning.
Full definition	:	Family's support to students' musical development and learning in terms of providing financial support, providing moral support, and creating musical environment at home since early childhood to date.
When to use	:	This code is used when there are evidences of parents or other family members supporting participants to develop their musical potential and support their music learning including sending them to music school and/or private music lessons and providing them support financially and morally since early childhood to date.
When not to use	:	Do not use this code when the form of supports are not derived from home environment but surrounding environments such as teachers and community centres. Please refer to EnvCom.
Environmental Factors		
Code	:	EnvUni
Brief definition	:	University's environment influences on students' motivation to learn music.
Full definition	:	The impact of the university's environment on students' choice of pursuing a music degree, their engagement in music learning, their persistence in completing the music degree and their envisioned future music-related career.
When to use	:	University environment includes the type of music courses offered (i.e., jazz, performance-based), supports received from the music teachers and lecturers, infrastructure support, and peer influence.
When not to use	:	Do not use this code when the influences are not derived from the university environments.
Code	:	EnvCom
Brief definition	:	The influence of community surroundings on students' motivation to learn music.
Full definition	:	The impact of community surroundings on students' musical development, interest in music, choice of pursuing a music degree, their engagement in music learning, their persistence in completing the music degree and their envisioned future music-related career.

When to use	:	Community surroundings include musical activities participated by students in the community centres, as part of their religious activities and cultural activities. This code also applies when students' musical development is influenced by people from their neighbourhood, and peers and teachers from music learning centre prior to studying music in university.
When not to use	:	Do not use this code when students' musical development is influenced by people who are next of kin such as aunties, uncles and cousins. Use FamSupt instead.
Relationships between Themes		
Code	:	FamBcg (Associated) Motivation
Brief definition	:	The relationships between family musical background and students' motivation
Full definition	:	The relationships between family musical background (family members including parents, siblings and relatives with musical background such as know how to play a musical instrument or have a music-related job) and students' motivation (observable behaviours that reflect students' engagement in a particular activity related to music).
Code	:	FamSupt (Associated) Motivation
Brief definition	:	The relationships between family support and students' motivation (observable behaviours that reflect students' engagement in a particular activity related to music)
Full definition	:	The relationships between family support (a source of financial, moral and cultural capitals which can include participation in students' music learning process, paying for music lessons, provide them with necessary musical items and moral support) and students' motivation (observable behaviours that reflect students' engagement in a particular activity related to music).
Code	:	EnvCom (Associated) Motivation
Brief definition	:	The relationships between surrounding environmental factors and students' motivation
Full definition	:	The relationships between surrounding environment (i.e., community centres, church, neighbourhood and music learning centres) and students' motivation (observable behaviours that reflect students' engagement in a particular activity related to music).
Code	:	EnvUni (Associated) Motivation
Brief definition	:	The relationships between university environmental factors and students' motivation
Full definition	:	The relationships between university environment (i.e., university system, pedagogy, teachers and peers) and students' motivation (observable behaviours that reflect students' engagement in a particular activity related to music).

References

'Polifonia' Working Group. (2011). *Reference points for the design and delivery of degree programmes in music*. Deusto: Tuning Educational Structures in Europe.

Abdullah, J. (1990). Music education in Malaysia: An overview. *The Quarterly, 1*(4), 44-53.

Abdullah, M. H. (2013). Music education in Malaysian public school: Implementation, issues and challenges. *Jurnal Pendidikan Bitara UPSI, 1*, 33-48.

AERA, APA, & NCME. (1985). *Standards for educational and psychological testing*. Washington, DC: APA.

AERA, APA, & NCME. (1999). *Standards for educational and psychological testing*. Washington, DC: AERA.

Ainley, M. (2010). Interest in the dynamics of task behavior: Processes that link person and task in effective learning. In T. C. Urdan & S. A. Karabenick (Eds.), *The decade ahead: Theoretical perspectives on motivation and achievement* (Vol. 16a, pp. 235-264). Wesk Yorkshire, UK: Emerald Group Publishing Limited.

Ainley, M., Corrigan, M., & Richardson, N. (2005). Students, tasks and emotions: Identifying the contribution of emotions to students' reading of popular culture and popular science texts. *Learning and Instruction, 15*(5), 433-447.

Alagumalai, S., & Curtis, D. D. (2005). Classical test theory. In S. Alagumalai & D. D. Curtis (Eds.), *Applied Rasch measurement: A book of exemplars* (pp. 1-14). The Netherlands: Springer.

Algina, J., & Penfield, R. D. (2009). Classical test theory. In R. E. Millsap & A. Maydeu-Olivares (Eds.), *The SAGE handbook of quantitative methods in psychology* (pp. 93-122). London: SAGE Publications.

Allison, P. D. (2002). *Missing data*. Thousand Oaks, CA: SAGE Publications.

Allison, P. D. (2003). Missing data techniques for structural equation modeling. *Journal of Abnormal Psychology, 112*(4), 545-557.

Allison, P. D. (2009). Missing data. In R. E. Millsap & A. Maydeu-Olivares (Eds.), *The SAGE handbook of quantitative methods in psychology* (pp. 72-89). London, UK: SAGE Publications.

Altheide, D. L., & Johnson, J. M. (2011). Reflections on interpretive adequacy in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (4th ed., pp. 581-594). Thousand Oaks, CA: SAGE Publications.

Andrich, D. (1978). A rating formulation for ordered response categories. *Psychometrika, 43*(4), 561-573.

Andrich, D. (1998). Thresholds, steps and rating scale conceptualization. *Rasch Measurement Transactions, 12*(3), 648-649.

Areepattamannil, S., Freeman, J. G., & Klinger, D. A. (2011). Influence of motivation, self beliefs, and instructional practices on science achievement of adolescents in Canada. *Social Psychology of Education: An International Journal, 14*(2), 233-259.

Atkinson, J. (1957). Motivational determinants of risk-taking behavior. *Psychological Review, 64*(6), 359-372.

Austin, J. R. (1988). The effect of music contest format on self-concept, motivation, achievement, and attitude of elementary band students. *Journal of Research in Music Education, 36*(2), 95-107.

Austin, J. R. (1991). Competitive and non-competitive goal structures: An analysis of motivation and achievement among elementary band students. *Psychology of Music, 19*(2), 142-158.

Austin, J. R., & Berg, M. H. (2006). Exploring music practice among sixth-grade band and orchestra students. *Psychology of Music, 34*(4), 535-558.

Austin, J. R., Renwick, J. M., & McPherson, G. E. (2006). Developing motivation. In G. E. McPherson (Ed.), *The child as musician: A handbook of musical development* (pp. 213-238). Oxford: Oxford University Press.

Austin, J. R., & Vispoel, W. P. (1998). How American adolescents interpret success and failure in classroom music: Relationships among attributional beliefs, self-concept and achievement. *Psychology of Music, 26*(1), 26-45.

Azen, R., & Budescu, D. (2009). Applications of multiple regression in psychological research. In R. E. Millsap & A. Maydeu-Olivares (Eds.), *The SAGE handbook of quantitative methods in psychology* (pp. 285-310). London, UK: SAGE Publications.

Bandura, A. (1971). *Social learning theory*. New York: General Learning Press.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191-215.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist, 37*(2), 122-147.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Engelwood Cliffs, NJ: Prentice Hall.

Bandura, A. (1989a). Human agency in social cognitive theory. *American Psychologist, 44*(9), 1175-1184.

Bandura, A. (1989b). Social cognitive theory. In R. Vasta (Ed.), *Annals of child development: A research journal* (Vol. 6, pp. 1-60). Greenwich, CT: JAI Press.

Barattucci, M., Pagliaro, S., Cafagna, D., & Bosetto, D. (2017). An examination of the applicability of Biggs' 3P learning process model to Italian university. *Journal of E-Learning and Knowledge Society, 13*(1), 163-180.

Bargh, J. A., Gollwitzer, P. M., & Oettingen, G. (2010). Motivation. In S. T. Fiske, D. T. Gilbert & G. Lindzey (Eds.), *Handbook of social psychology* (5th ed., Vol. 2, pp. 268-316). Hoboken, NJ: John Wiley & Sons Inc.

Barnes, G. V., DeFreitas, A., & Grego, J. (2016). Parental involvement and home environment in music: Current and former students from selected community music programs in Brazil and the United States. *International Journal of Music Education, 34*(2), 208-218.

Bergin, D. A. (1999). Influences on classroom interest. *Educational Psychologist, 34*(2), 87-98.

Biggs, J. (1987). *Student approaches to learning and studying*. Hawthorn: Australian Council for Educational Research.

Biggs, J. (1999). *Teaching for quality learning at university: What the student does*. Buckingham: Open University Press.

Bock, R. D. (1983). The discrete Bayesian. In H. Wainer & S. Messick (Eds.), *Principals of modern psychological measurement. A festschrift for Frederick M. Lord* (pp. 103-115). Hillsdale, NJ: Lawrence Earlbaum.

Bock, R. D., & Aitkin, M. (1981). Marginal maximum likelihood estimation of item parameters: Application of an EM alogorithm. *Psychometrika, 46*(4), 443-459.

Bøe, M. V. (2012). Science choices in Norwegian upper secondary school: What matters? *Science Education, 96*(1), 1-20.

Boekaerts, M. (2010). Coping with stressful situations: An important aspects of self-regulation. In P. Peterson, E. Baker & B. McGaw (Eds.), *International encyclopedia of education* (3rd ed., pp. 570-575). Retrieved from Elsevier database.

Bond, T. G., & Bond, M. (2011). Measure for measure: Curriculum requirements and children's achievement in music education. In N. J. S. Brown, B. Duckor, K. Draney & M. Wilson (Eds.), *Advances in Rasch measurement* (Vol. 2, pp. 327-350). Maple Grove, Minnesota: JAM Press.

Bond, T. G., & Fox, C. M. (2015). *Applying the Rasch model: Fundamental measurement in the human sciences* (3rd ed.). London, UK: Taylor & Francis Ltd.

Bong, M., & Clark, R. E. (1999). Comparison between self-concept and self-efficacy in academic motivation research. *Educational Psychologist, 34*(3), 139-153.

Bong, M., & Skaalvik, E. M. (2003). Academic self-concept and self-efficacy: How different are they really? *Educational Psychology Review, 15*(1), 1-39.

Borkowski, J. G., Ramey, S. L., & Bristol-Power, M. (Eds.). (2002). *Parenting and the child's world: Influences on academic, intellectual, and social-emotional development*. Mahwah, NJ: Lawrence Erlbaum.

Brady, L., & Kennedy, K. (2009). *Celebrating student achievement* (3rd ed.). Sydney: Pearson Australia.

Brand, M. (1985). Development and validation of the home musical environmental scale for use at the early elementary level. *Psychology of Music, 13*(1), 40-48.

Brand, M. (1986). Relationships between home musical environment and selected musical attributes of second-grade children. *Journal of Research in Music Education, 34*(2), 111-120.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 2*(2), 77-101.

Broad, S., & O'Flynn, J. (2012). Special issue: Current issues in high music education. *Music Education Research, 14*(1), 1-7.

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist, 32*(7), 513-531.

Bryan, R. R., Glynn, S. M., & Kittleson, J. M. (2011). Motivation, achievement, and advanced placement intent of high school students learning science. *Science Education, 95*(6), 1049-1065.

Buchmann, C. (2002). Measuring family background in international studies of education: Conceptual issues and methodological challenges. In A. C. Porter & A. Gamoran (Eds.), *Methodological advances in cross-national surveys of educational achievement* (pp. 150-197). Washington, DC: National Academy Press.

Carr, M. (Ed.). (1996). *Motivation in mathematics*. Cresskill, NJ: Hampton Press.

Carreira, M. J. (2004). *Motivation for learning English as a foreign language in Japanese elementary schools.* (Unpublished master's thesis), Tsuda College, Tokyo, Japan.

Carreira, M. J. (2005). New framework of instrinsic/extrinsic and integrative/instrumental motivation in second language acquisition. *The Keiai Journal of International Studies, 16*, 39-64.

Cassidy, S. (2011). Self-regulated learning in higher education: Identifying key component processes. *Studies in Higher Education, 36*(8), 989-1000.

Catterall, J. S., Chapleau, R., & Iwanaga, J. (1999). Involvement in the arts and human development: General involvement and intensive involvement in music and theatre

arts. In E. Fiske (Ed.), *Champions of change: The impact of arts on learning* (pp. 1-18). Washington DC: Arts Education Partnership and President's Committee on the Arts and Humanities.

Chan, E. K. H. (2014). Standards and guidelines for validation practices: Development and evaluation of measurement instruments. In B. D. Zumbo & E. K. H. Chan (Eds.), *Validity and validation in social, behavioral, and health sciences* (pp. 9-24). Switzerland: Springer International Publishing.

Chang, Y. (2015). Science motivation across Asian countries: Links among future-oriented motivation, self-efficacy, task values, and achievement outcomes. *The Asia-Pacific Education Researcher, 24*(1), 247-258.

Cheema, J. R. (2014). Some general guidelines for choosing missing data handling methods in educational research. *Journal of Modern Applied Statistical Methods, 13*(2), 53-75.

Chen, S. K., Yeh, Y. C., Hwang, F. M., & Lin, S. S. J. (2013). The relationship between academic self-concept and achievement: A multicohort-multioccasion study. *Learning and Individual Differences, 23*.

Cheung, C. S. S., & Pomerantz, E. M. (2012). Why does parents' involvement enhance children's achievement? The role of parent-oriented motivation. *Journal of Educational Psychology, 104*(3), 820-832.

Ciorba, C. R., & Smith, N. Y. (2009). Measurement of instrumental and vocal undergraduate performance juries using a multidimensional assessment rubric. *Journal of Research in Music Education, 57*(1), 5-15.

Clark, T., Lisboa, T., & Williamon, A. (2014). Learning to be an instrumental musician. In I. Papageorgi & G. F. Welch (Eds.), *Advanced musical performance: Investigations in higher education learning* (pp. 287-300). Surrey, England: Ashgate Publishing.

Clinton, V. (2014). The relationship between students' preferred approaches to learning and behaviors during learning: An examination of the process stage of the 3P model. *Instructional Science, 42*(5), 817-837.

Cogdill, S. H. (2015). Applying research in motivation and learning to music education: What the experts say. *Update: Applications of Research in Music Education, 33*(2), 49-57.

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education* (6th ed.). London: Routledge Taylor & Francis.

Cole, J. S., Bergin, D. A., & Whittaker, T. A. (2008). Predicting student achievement for low stakes tests with effort and task value. *Contemporary Educational Psychology, 33*(4), 609-624.

Collens, P., & Creech, A. (2013). Intersubjectivity in collaborative learning in one-to-one contexts. In H. Gaunt & H. Westerlund (Eds.), *Collaborative learning in higher music education* (pp. 151-161). Surrey, England: Ashgate.

Collins, K. M. T. (2010). Advanced sampling designs in mixed research: Current practices and emerging trends in the social and behavioral sciences. In A. Tashakkori & C. Teddlie (Eds.), *SAGE handbook of mixed methods in social and behavioral research* (2nd ed., pp. 353-378). Thousand Oaks, CA: SAGE Publications.

Cramer, D. (2003). *Advanced quantitative data analysis*. Philadelphia, PA: Open University Press.

Credé, M., & Phillips, L. A. (2011). A meta-analytic review of the Motivated Strategies for Learning Questionnaire. *Learning and Individual Differences, 21*(4), 337-346.

Creech, A. (2009). The role of the family in supporting learning. In S. Hallam, I. Cross & M. Thaut (Eds.), *The oxford handbook of music psychology* (pp. 295-306). Oxford: Oxford University Press.

Creech, A. (2010). The music studio. In S. Hallam & A. Creech (Eds.), *Music education in the 21st century in the United Kingdom: Achievements, analysis and aspirations* (pp. 295-313). Bedford Way, London: Institute of Education, University of London.

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Boston: Pearson.

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks, CA: SAGE Publications.

Creswell, J. W. (2015). *A concise introduction to mixed methods research*. Thousand Oaks, CA: SAGE Publications, Inc.

Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed.). California: Sage Publications.

Cronbach, L. J. (1984). *Essentials of psychological testing* (4th ed.). New York: Harper and Row.

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin, 52*(4), 281-302.

Cudeck, R., & du Toit, S. (2009). General structural equation models. In R. E. Millsap & A. Maydeu-Olivares (Eds.), *The SAGE handbook of quantitative methods in psychology* (pp. 515-539). London: SAGE Publications.

Custodero, L. A., & Johnson-Green, E. A. (2003). Passing the cultural torch: Musical experience and musical parenting of infants. *Journal of Research in Music Education, 51*(2), 102-114.

Dahl, G. B., & Lochner, L. (2012). The impact of family income on child achievement: Evidence from the earned income tax credit. *American Economic Review, 102*(5), 1927-1956.

Davidson, J. W., & Burland, K. (2006). Musician identity formation. In G. E. McPherson (Ed.), *The child as musician: A handbook of musical development* (pp. 475-490). Oxford: Oxford University Press.

Davidson, J. W., Howe, M. J. A., Moore, D. G., & Sloboda, J. A. (1996). The role of parental influences in the development of musical performance. *British Journal of Developmental Psychology, 14*(4), 399-412.

Davies-Kean, P. (2005). The influence of parent education and family income on child achievement: The indirect role of parental expectations and the home environment. *Journal of Family Psychology, 19*(2), 294-304.

Davison, P. (2010). The role of self-efficacy and modeling in improvisation among intermediate instrumental music students. *Journal of Band Research, 45*(2), 42-58.

Deci, E. L. (1980). *The psychology of self-determination*. Lexington, MA: D. C. Heath.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behaviour*. New York: Plenum.

Deci, E. L., & Ryan, R. M. (2001). Self-determination theory. In N. J. Smelser & P. B. Baltes (Eds.), *International encyclopaedia of the social and behavioral sciences* (pp. 486-491). Retrieved from Elsevier database.

Denscombe, M. (2010). *The good research guide: For small-scale social research projects*. Maidenhead, England: Open University Press.

Denzin, N. K., & Lincoln, Y. S. (2011). Part II: Paradigm and perspectives in contention. In N. K. Denzin & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (pp. 91-95). Thousand Oaks, CA: SAGE Publications.

Dewey, J. (1913). *Interest and effort in education*. Boston: Houghton Mifflin.

Diamantopoulos, A., & Siguaw, J. A. (2000). *Introducing LISREL: A guide for the uninitiated*. London: SAGE Publications.

Donnelly, P. J., & Limb, C. J. (2009). Music. In L. R. Squire (Ed.), *Encyclopedia of Neuroscience* (pp. 1151-1158). Oxford: Academic Press.

Dörnyei, Z., Csizér, K., & Németh, N. (2006). *Motivation, language attitudes and globalisation: A Hungarian perspective*. Clevedon, GB: Multilingual Matters.

du Toit, S., du Toit, M., Mels, G., & Cheng, Y. (2006). *LISREL for Windows: PRELIS user's guide*. Lincolnwood, IL: Scientific Software International.

Duncan, T. G., & McKeachie, W. J. (2005). The making of the Motivated Strategies for Learning Questionnaire. *Educational Psychologist, 40*(2), 117-128.

Dunn, K. E., Lo, W., Mulvenon, S. W., & Sutcliffe, R. (2012). Revisiting the Motivated Strategies for Learning Questionnaire: A theoretical and statistical reevaluation of the metacognitive self-regulation and effort regulation subscales. *Educational and Psychological Measurement, 72*(2), 312-331.

Durik, A. M., Vida, M., & Eccles, J. S. (2006). Task values and ability beliefs as predictors of high school literacy choices: A developmental analysis. *Journal of Educational Psychology, 98*(2), 382-393.

Eccles, J. S. (1983). Expectancies, values, and academic behaviours. In J. T. Spence (Ed.), *Achievement and achievement motives* (pp. 75-146). San Francisco, CA: Freeman.

Eccles, J. S., O'Neill, S. A., & Wigfield, A. (2005). Ability self-perceptions and subjective task values in adolescents and children. In K. A. Moore & L. Lippman (Eds.), *What do children need to flourish?: Conceptualizing and measuring indicators of positive development* (pp. 237-249). New York, NY: Springer.

Eccles, J. S., & Wigfield, A. (1995). In the mind of the actor: The structure of adolescents' achievement task values and expectancy-related beliefs. *Personality and Social Psychology Bulletin, 21*(3), 215-225.

Edwards, R. D. (2008). *The neurosciences and music education: An online database of brain imaging neuromusical research.* (Doctoral dissertation), University of North Carolina, USA. Retrieved from http://libres.uncg.edu/ir/uncg/f/umi-uncg-1523.pdf

Eisner, E. W. (1991). *The enlightened eye: Qualitative inquiry and the enhancement of educational practice*. New York: MacMillan.

Ely, M. C., & Rashkin, A. E. (2005). *Dictionary of music education: A handbook of terminology*. Chicago, IL: GIA Publications Inc.

Embretson, S. E. (1996). The new rules of measurement. *Psychological Assessment, 8*(4), 341-349.

Engelhard, G. (2013). *Invariant measurement: Using Rasch models in the social, behavioral, and health sciences*. New York: Routledge.

Ericsson, K. A., Krampe, R. T., & Tesch-Römer, C. (1993). The role of delibrate practice in the acquisition of expert performance. *Psychological Review, 100*(3), 363-406.

Ewing, R. (2010). *The arts and australian education: Realising potential*. Victoria, Australia: ACER Press.

Fabozzi, F. J., Focardi, S. M., & Rachev, S. T. (2014). *The basics of financial econometrics: Tools, concepts, and asset management applications*. Hoboken, NJ: John Wiley & Sons, Inc.

Fan, W., & Williams, C. M. (2010). The effects of parental involvement on students' academic self-efficacy, engagement and intrinsic motivation. *Educational Psychology, 30*(1), 53-74.

Fan, W., Williams, C. M., & Wolters, C. A. (2012). Parental involvement in predicting school motivation: Similar and differential effects across ethnic groups. *Journal of Educational Research, 105*(1), 21-35.

Fletcher, J. C. (2015). *Religious music in everyday life: Adolescents' identity work in Catholic schooling.* (Doctoral dissertation), The University of Queensland, Australia. Retrieved from https://espace.library.uq.edu.au/data/UQ_360237/s4093277_phd_submission.pdf?Expires=1489463714&Signature=XQuU~tFkAX12MXsmYvtYGQSS3JJ6EVkf6ora8cn3bTtbSdMp-CESTjxHk53noHNCC6xDEt2fUi1icW9L8dkRU6TYoRQmjeKN~Y4-5b6fV3X8OV8DJCtj0vulYdjtp~OIGpiuLuNWjTvoC8cuCTMNAC7F7Fbt-VgREPvBDjlr1zLUPbinMMi8FPPfruS~VRKFeBcupGXT0RdTsNuTXANj3hSz0iV6rT8nT0ZnlXwTzotVL3dBfZloAfaFavqiXKYEsTb30kOFG3MTTgDYsXm7T9LBdOC77M7sHkAbTleUF54cQuHzrkrEolG9fnesieHrT~ZItDKs8q-3RHy2bvpBwg__&Key-Pair-Id=APKAJKNBJ4MJBJNC6NLQ

Flick, U. (2014). *An introduction to qualitative research* (5th ed.). London: SAGE Publications.

Fredricks, J. A., & Eccles, J. S. (2002). Children's competence and value beliefs from childhood through adolescence: Growth trajectories in two male-sex-typed domains. *Developmental Psychology, 38*(4), 519-533.

Galindo, C., & Sheldon, S. B. (2012). School and home connections and children's kindergarten achievement gains: The mediating role of family involvement. *Early Childhood Research Quarterly, 27*(1), 90-103.

GAP. (2011). *Tertiary music education in Australia*. Chippendale, NSW: GAP.

Gaunt, H. (2011). Understanding the one-to-one relationship in instrumental/vocal tuition in higher education: Comparing student and teacher perceptions. *British Journal of Music Education, 28*(2), 159-179.

Gaunt, H., & Hallam, S. (2009). Individuality in the learning of musical skills. In S. Hallam, I. Cross & M. Thaut (Eds.), *The oxford handbook of music psychology* (pp. 274-284). Oxford: Oxford University Press.

Gaunt, H., & Papageorgi, I. (2010). Music in universities and conservatoires. In S. Hallam & A. Creech (Eds.), *Music education in the 21st century in the United Kingdom: Achievements, analysis and aspirations* (pp. 260-278). Bedford Way, London: Institute of Education, University of London.

Gaunt, H., & Westerlund, H. (Eds.). (2013). *Collaborative learning in higher music education*. Surrey, England: Ashgate Publishing.

Gelfand, L. A., Mensinger, J. L., & Tenhave, T. (2009). Mediation analysis: A retrospective snapshot of practice and more recent directions. *The Journal of General Psychology, 136*(2), 153-178.

Ghazali, G. M. (2006). *Factors influencing Malaysian children's motivation to learn music.* (Doctoral dissertation), University of New South Wales, Australia. Retrieved from http://www.unsworks.unsw.edu.au/primo_library/libweb/action/dlDisplay.do?vid=UNSWORKS&docId=unsworks_807

Ghazali, G. M., & McPherson, G. E. (2009). Malaysian children's attitudes towards learning music. *Music Education Research, 11*(2), 193-219.

Given, L. M. (Ed.). (2008). *The SAGE encyclopedia of qualitative research methods* (Vol. 1 & 2). Thousand Oaks, CA: SAGE Publications.

González-Moreno, P. A. (2012). Student motivation in graduate music programmes: An examination of personal and environmental factors. *Music Education Research, 14*(1), 79-102.

Gordon, E. E. (2002). *Rating scales and their uses for measuring and evaluating achievement in music performance*. Chicago: GIA Publications.

Graham, J. W. (2012). *Missing data: Analysis and design*. New York: Springer.

Guba, E. G. (1981). Criteria for assessing the trustworthiness of naturalistic inquiries. *Educational Communication and Technology Journal, 29*(2), 75-91.

Guest, G., MacQueen, K. M., & Namey, E. E. (2012). *Applied thematic analysis*. Thousand Oaks, CA: SAGE Publications.

Guo, J., Parker, P. D., Marsh, H. W., & Morin, A. J. S. (2015). Achievement, motivation, and educational choices: A longitudinal study of expectancy and value using a multiplicative perspective. *Developmental Psychology, 51*(8), 1163-1176.

Haggerty, J. F., & Fox, J. (2015). Raising the bar: Language testing experience and second language motivation among South Korean young adolescents. *Language Testing in Asia*, *5*(11), 1-16.

Hailaya, W., Alagumalai, S., & Ben, F. (2014). Examining the utility of assessment literacy inventory and its portability to education systems in the Asia Pacific region. *Australian Journal of Education, 58*(3), 297-317.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Upper Saddle River, NJ: Prentice Hall.

Hallam, S. (1998). *Instrumental teaching: A practical guide to better teaching and learning*. Oxford: Heinemann Educational Publishers.

Hallam, S. (2004). How important is practicing as a predictor of learning outcomes in instrumental music? In S. D. Lipscomb, R. Ashley, R. O. Gjerdingen & P. Webster (Eds.), *Proceedings of the 8th International Conference on Music Perception and Cognition* (pp. 165-168). Evanston, IL: Northwestern University.

Hallam, S. (2009). Motivation to learn. In S. Hallam, I. Cross & M. Thaut (Eds.), *The Oxford handbook of music psychology* (pp. 285-294). Oxford, UK: Oxford University Press.

Hallam, S. (2010). The power of music: Its impact on the intellectual, personal and social development of children and young people. In S. Hallam & A. Creech (Eds.), *Music education in the 21st century in the United Kingdom: Achievements, analysis and aspirations* (pp. 2-17). Bedford Way, London: Institute of Education, University of London.

Hallam, S. (2013). What predicts level of expertise attained, quality of performance, and future musical aspirations in young instrumental players? *Psychology of Music, 41*(3), 267-291.

Hallam, S. (2014). Developing and maintaining motivation in advanced music performers. In W. Graham & I. Papageorgi (Eds.), *Advanced musical performance: Investigations in higher education learning* (pp. 333-348). Surrey, England: Ashgate Publishing.

Hallam, S. (2016). Motivation to learn. In S. Hallam, I. Cross & M. Thaut (Eds.), *The Oxford handbook of music psychology* (2nd ed., pp. 479-492). Oxford, UK: Oxford University Press.

Hambleton, R. K., & Jones, R. W. (1993). Comparison of classical test theory and item response theory and their applications to test development. *Educational Measurement: Issues and Practice, 12*(3), 253-262.

Hardt, J., Herke, M., Brian, T., & Laubach, W. (2013). Multiple imputation of missing data: A simulation study on a binary response. *Open Journal of Statistics, 3*(5), 370-378.

Harnischmacher, C. (1997). The effects of individual differences in motivation, volition, and maturational processes on practice behavior of young instrumentalists. In H. Jørgensen & A. C. Lehmann (Eds.), *Does practice make perfect? Current theory and research on instrumental practice* (pp. 71-88). Oslo, Norway: Norges Musikkhøgskole.

Hedden, S. K. (1982). Prediction of music achievement in the elementary school. *Journal of Research in Music Education, 30*(1), 61-68.

Hemmings, B., Grootenboer, P., & Kay, R. (2011). Predicting mathematics achievement: The influence of prior achievement and attitudes. *International Journal of Science and Mathematics Education, 9*(3), 691-705.

Hewitt, M. P. (2015). Self-efficacy, self-evaluation, and music performance of secondary-level band students. *Journal of Research in Music Education, 63*(3), 298-313.

Hibberts, M., Johnson, R. B., & Hudson, K. (2012). Common survey sampling techniques. In L. Gideon (Ed.), *Handbook of survey methodology for the social sciences* (pp. 53-74). Dordrecht: Springer.

Hidi, S. (1990). Interest and its contribution as a mental resource for learning. *Review of Educational Research, 60*(4), 549-571.

Hidi, S., & Renninger, K. A. (2006). The four-phase model of interest development. *Educational Psychologist, 41*(2), 111-127.

Hidi, S., Renninger, K. A., & Krapp, A. (2004). Interest, a motivational variable that combines affective and cognitive functioning. In D. Y. Dai & R. J. Sternberg (Eds.), *Motivation, emotion, and cognition* (pp. 89-115). Mahwah, NJ: Lawrence Erlbaum Associates.

Hodges, D. A. (1997). What neuromusical research has to offer music education. *The Quarterly Journal of Music Teaching and Learning, 7*(2-4), 36-48.

Holzenspies, L. (2009). *Research on professional musicians' portfolio careers in the Netherlands*. Amsterdam: KNTV.

Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural equation modelling: Guidelines for determining model fit. *The Electronic Journal of Business Research Methods, 6*(1), 53-60.

Howe, M. J. A., & Sloboda, J. (1991). Young musicians' accounts of significant influences in their early lives. 1. The family and the musical background. *British Journal of Music Education, 8*(1), 39-52.

Huang, C. (2011). Self-concept and academic achievement: A meta-analysis of logitudinal relations. *Journal of School Psychology, 49*(5), 505-528.

Hull, C. L. (1943). *Principles of behavior: An introduction to behavior theory*. New York: Appleton-Century-Crofts.

Hulleman, C. S., Godes, O., Hendricks, B. L., & Harackiewicz, J. M. (2010). Enhancing interest and performance with a utility value intervention. *Journal of Educational Psychology, 102*(4), 880-895.

Iacobucci, D. (2010). Structural equations modeling: Fit indices, sample size, and advanced topics. *Journal of Consumer Psychology, 20*(1), 90-98.

Jabusch, H.-C., Alpers, H., Kopiez, R., Vauth, H., & Altenmüller, E. (2009). The influence of practice on the development of motor skills in pianists: A longitudinal study in a selected motor task. *Human Movement Science, 28*(1), 74-84.

James, W. (1890). *The principles of psychology*. New York: Henry Holt and Company.

Jiang, Y., Song, J., Lee, M., & Bong, M. (2014). Self-efficacy and achievement goals as motivational links between perceived contexts and achievement. *Educational Psychology, 34*(1), 92-117.

Johansson, K. (2012). Experts, entrepreneurs and competence nomads: The skills paradox in higher music education. *Music Education Research, 14*(1), 45-62.

Johnson, B., & Gray, R. (2010). A history of philosophical and theoretical issues for mixed methods research. In A. Tashakkori & C. Teddlie (Eds.), *SAGE handbook of mixed methods in social and behavioral research* (2nd ed., pp. 69-94). Thousand Oaks, CA: Sage Publications.

Jones, B. D., & Wilkins, J. L. M. (2013). Testing the MUSIC model of academic motivation through confirmatory factory analysis. *Educational Psychology, 33*(4), 482-503.

Jöreskog, K. G., & Sörbom, D. (2006). LISREL 8.80 for Windows [Computer software]. Lincolnwood, IL: Scientific Software International, Inc.

Jørgensen, H. (2000). Student learning in higher instrumental education: Who is responsible? *British Journal of Music Education, 17*(1), 67-77.

Jørgensen, H. (2002). Instrumental performance expertise and amount of practice among instrumental students in a conservatoire. *Music Education Research, 4*(1), 105-119.

Jørgensen, H. (2010). Higher music education institutions: A neglected arena for research? *Bulletin of the Council for Research in Music Education, 186*, 67-80.

Jørgensen, H., & Hallam, S. (2009). Practising. In S. Hallam, I. Cross & M. Thaut (Eds.), *The Oxford handbook of music psychology* (pp. 265-273). Oxford: Oxford University Press.

Kane, M. T. (2013). Validating the interpretations and uses of test scores. *Journal of Educational Measurement, 50*(1), 1-73.

Keeves, J. P., & Alagumalai, S. (1999). New approaches to measurement. In G. N. Masters & J. P. Keeves (Eds.), *Advances in measurement in educational research and assessment* (pp. 23-42). The Netherlands: Pergamon.

Keeves, J. P., & Masters, G. N. (1999). Introduction. In G. N. Masters & J. P. Keeves (Eds.), *Advances in measurement in educational research and assessment* (pp. 1-16). The Netherlands: Pergamon.

Kelley, T., Ebel, R., & Linacre, J. M. (2002). Item discrimination indices. *Rasch Measurement Transactions, 16*(3), 883-884.

Kenny, D. A. (2016). Mediation. Retrieved 15th March, 2017, from http://davidakenny.net/cm/mediate.htm

Khajehpour, M., & Ghazvini, S. D. (2011). The role of parental involvement affect in children's academic performance. *Procedia Social and Behavioural Sciences, 15*, 1204-1208.

Kimura, Y., Nakata, Y., & Okumura, T. (2001). Language learning motivation of EFL learners in Japan: A cross-sectional analysis of various learning milieus. *JALT Journal, 23*(1), 47-68.

Kirshenblatt-Gimblett, B. (2006). *What is research design?* New York: New York University.

Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). New York, NY: The Guildford Press.

Kline, T. J. B. (2005). *Psychological testing: A practical approach to design and evaluation*. USA: Sage Publications.

Klinedinst, R. E. (1991). Predicting performance achievement and retention of fifth-grade instrumental students. *Journal of Research in Music Education, 39*(3), 225-238.

Köller, O., Baumert, J., & Schnabel, K. (2001). Does interest matter? The relationship between academic interest and achievement in mathematics. *Journal for Research in Mathematics Education, 32*(5), 448-470.

Krapp, A. (2005). Basic needs and the development of interest and intrinsic motivational orientations. *Learning and Instruction, 15*(5), 381-395.

Kvale, S. (1996). *InterViews: An introduction to qualitative research interviewing*. Thousand Oaks, CA: SAGE Publications.

LaGasse, A. B. (2014). Effects of music therapy group intervention on enhancing social skills in children with Autism. *Journal of Music Therapy, 51*(3), 1-26.

Larson, L. M., Stephen, A., Bonitz, V. S., & Wu, T. F. (2014). Predicting science achievement in India: Role of gender, self-efficacy, interests, and effort. *Journal of Career Assessment, 22*(1), 89-101.

Latukefu, L., & Verenikina, I. (2013). Expanding the master-apprentice model: Tool for orchestrating collaboration as a path to self-directed learning for singing students. In H. Gaunt & H. Westerlund (Eds.), *Collaborative learning in higher music education* (pp. 101-110). Surrey, England: Ashgate.

Lebler, D. (2015). Future directions for assessment in music. In D. Lebler, G. Carey & S. D. Harrison (Eds.), *Assessment in music education: From policy to practice* (pp. 1-8). Switzerland: Springer International Publishing.

LeCompte, M. D., & Goetz, J. P. (1982). Problems of reliability and validity in ethnographic research. *Review of Educational Research, 51*(1), 31-60.

Lehmann, A. C., & Jørgensen, H. (2012). Practice. In G. E. McPherson & G. F. Welch (Eds.), *The Oxford handbook of music education* (Vol. 1, pp. 677-693). New York: Oxford University Press.

Lehmann, A. C., Sloboda, J. A., & Woody, R. H. (2007). *Psychology for musicians: Understanding and acquiring the skills*. New York: Oxford University Press.

Leibham, M. B., Alexander, J. M., & Johnson, K. E. (2013). Science interests in preschool boys and girls: Relations to later self-concept and science achievement. *Science Education, 97*(4), 574-593.

Leung, B. W., & McPherson, G. E. (2011). Case studies of factors affecting the motivation of musical high achievers to learn music in Hong Kong. *Music Education Research, 13*(1), 69-91.

Leung, C. C., Wan, Y. Y., & Lee, A. (2009). Assessment of undergraduate students' music compositions. *International Journal of Music Education, 27*(3), 250-268.

Leung, K. C., Marsh, H. W., Craven, R. G., & Abduljabbar, A. S. (2015). Measurement invariance of the Self-Description Questionnaire II in a Chinese sample. *European Journal of Psychological Assessment, 32*(2), 128-139.

Leung, L. (2015). Validity, reliability, and generalizability in qualitative research. *Journal of Family Medicine and Primary Care, 4*(3), 324-327.

Levesque, C., Copeland, K. J., Pattie, M. D., & Deci, E. L. (2010). Intrinsic and extrinsic motivation. In P. Peterson, E. Baker & B. McGaw (Eds.), *International encyclopaedia of education* (3rd ed.): Retrieved from Elsevier database.

Linacre, J. M. (2001). Category, step and threshold: Definitions and disordering. *Rasch Measurement Transactions, 15*(1), 794.

Linacre, J. M. (2007). Warm's mean Weighted Likelihood Estimates (WLE) of Rasch measures. *Rasch Measurement Transactions, 21*(1), 1094.

Linn, R. L. (2010). Validity. In P. Peterson, E. Baker & B. McGaw (Eds.), *International encyclopaedia of education* (pp. 181-185). Retrieved from Elsevier database.

Linnenbrink-Garcia, L., Maehr, M. L., & Pintrich, P. R. (2011). Motivation and achievement. In R. Colwell & P. R. Webster (Eds.), *MENC handbook of research on music learning: Strategies* (Vol. 1, pp. 216-264). Oxford: Oxford University Press.

Little, R. J., & Rubin, D. B. (2015). Missing data. In J. D. Wright (Ed.), *International encyclopedia of the social and behavioral sciences* (2nd ed., Vol. 15, pp. 602-607). Retrieved from Elsevier Database.

Lohbeck, A., Nitkowski, D., & Petermann, F. (2016). A control-value theory approach: Relationships between academic self-concept, interest, and test anxiety in elementary school children. *Child & Youth Care Forum, 45*(6), 887-904.

Lord, F. M. (1980). *Applications of item response theory to practical testing problems*. New Jersey: Lawrence Earlbaum.

Lubin, J. H., Colt, J. S., Camann, D., Davis, S., Cerhan, J. R., Severson, R. K., Bernstein, L., & Hartge, P. (2004). Epidemiologic evaluation of measurement data in the presence of detection limits. *Environmental Health Perspectives, 112*(17), 1691-1696.

MacCallum, R. C. (2009). Factor analysis. In R. E. Millsap & A. Maydeu-Olivares (Eds.), *The SAGE handboook of quantitative methods in psychology* (pp. 123-147). London: SAGE Publications.

Malte, J., Ronny, S., & Ulrich, S. (2015). Students' self-concept and self-efficacy in the sciences: Differential relations to antecedents and educational outcomes. *Contemporary Educational Psychology, 41*, 13-24.

Mark, M. L. (Ed.). (2008). *Music education: Source readings from ancient Greece to today* (3rd ed.). New York: Routledge.

Marsh, H. W. (1988). *Self Description Questionnaire: A theoretical and empirical basis for the measurement of multiple dimensions of preadolescent self-concept: A test manual and a research monograph*. San Antonio, TX: Psychological Corporation.

Marsh, H. W. (1990a). *Self-Description Questionnaire (SDQ) II: A theoretical and empirical basis for the measurement of multiple dimensions of adolescent self-concept: An interim test manual and a research monograph*. San Antonio, TX: Psychological Corporation.

Marsh, H. W. (1990b). The structure of academic self-concept: The Marsh/Shavelson model. *Journal of Educational Psychology, 82*(4), 623-636.

Marsh, H. W. (1992). The content specificity of relations between academic achievement and academic self-concept. *Journal of Educational Psychology, 84*(1), 35-42.

Marsh, H. W., & Martin, J. A. (2011). Academic self-concept and academic achievement: Relations and casual ordering. *British Journal of Educational Psychology, 81*(1), 59-77.

Marsh, H. W., & Scalas, L. F. (2010). Self-concept in learning: Reciprocal effects model between academic self-concept and academic achievement. In P. Peterson, E. Baker & B. McGaw (Eds.), *International encyclopaedia of education* (3rd ed., pp. 660-667): Retrieved from Elsevier database.

Marsh, H. W., & Shavelson, R. J. (1985). Self-concept: Its multifaceted, hierarchical structure. *Educational Psychologist, 20*(3), 107-125.

Martin, J. (2010). Self-concept as persons' understanding and evaluation of their own actions and experiences: Looking backward and forward from where we are. In T. C. Urdan & S. A. Karabenick (Eds.), *The decade ahead: Theoretical perspectives on motivation and achievement* (5th ed., Vol. 16a, pp. 167-198). West Yorkshire, UK: Emerald Group Publishing Limited.

Martin, M. O., Mullis, I. V. S., & Foy, P. (2008). *TIMSS 2007 international science report: Findings from IEA's Trends in International Mathematics and Science Study at the fourth and eighth grades*. Chestnut Hill, MA: TIMSS & PIRLS International Study Center, Boston College.

Masgoret, A.-M., & Gardner, R. C. (2003). Attitudes, motivation, and second language learning: A meta-analysis of studies conducted by Gardner and associates. *Language Learning, 53*(1), 167-210.

Mason, G. (1987). Coping with collinearity. *The Canadian Journal of Program Evaluation, 2*(1), 97-93.

Masters, G. N. (1982). A Rasch model for partial credit scoring. *Psychometrika, 47*(2), 149-174.

Maxwell, J. A. (1992). Understanding and validity in qualitative research. *Havard Educational Review, 62*(3), 279-301.

Maxwell, J. A., & Mittapalli, K. (2008). Explanatory research. In L. M. Given (Ed.), *The SAGE encyclopedia of qualitative research method* (Vol. 1 & 2, pp. 323-325). Thousand Oaks, CA: SAGE Publications.

McCarthy, M. (2012). International perspectives. In G. E. McPherson & G. F. Welch (Eds.), *The Oxford handbook of music education* (Vol. 1, pp. 40-62). New York: Oxford University Press.

McClellan, E. R. (2011). Relationships among parental influences, selected demographic factors, adolescent self-concept as a future music educator, and the decision to major in music education. *Bulletin of the Council for Research in Music Education, 187*, 49-64.

McClelland, D. C. (1985). *Human motivation*. Chicago: Scott Foresman.

McCormick, J., & McPherson, G. E. (2007). Expectancy-value motivation in the context of a music performance examination. *Musicae Scientiae, 11*(2), 37-52.

McNamara, A., Holmes, P., & Collins, D. (2006). The pathway to excellence: The role of psychological characteristics in negotiating the challenges of musical development. *British Journal of Music Education, 23*(3), 285-302.

McPherson, G. E. (2001). Commitment and practice: Key ingredients for achievement during the early stages of learning a musical instrument. *Bulletin of the Council for Research in Music Education, 147*, 122-127.

McPherson, G. E., Bailey, M., & Sinclair, K. E. (1997). Path analysis of a theoretical model to describe the relationship among five types of musical performance. *Journal of Research in Music Education, 45*(1), 103-129.

McPherson, G. E., & Davidson, J. W. (2002). Musical practice: Mother and child interactions during the first year of learning an instrument. *Music Education Research, 4*(1), 143-158.

McPherson, G. E., & Davidson, J. W. (2006). Playing an instrument. In G. E. McPherson (Ed.), *The child as musician: A handbook of musical development* (pp. 331-351). Oxford: Oxford University Press.

McPherson, G. E., & McCormick, J. (1999). Motivational and self-regulated learning componenets of musical practice. *Bulletin of the Council for Research in Music Education, 141*, 98-102.

McPherson, G. E., & McCormick, J. (2000). The contribution of motivational factors to instrumental performance in a music examination. *Research Studies in Music Education, 15*(1), 31-39.

McPherson, G. E., & McCormick, J. (2006). Self-efficacy and music performance. *Psychology of Music, 34*(3), 322-336.

McPherson, G. E., & O'Neill, S. A. (2010). Students' motivation to study music as compared to other school subjects: A comparison of eight countries. *Research Studies in Music Education, 32*(2), 101-137.

McPherson, G. E., Osborne, M. S., S., B. M., Davidson, J. W., & Faulkner, R. (2015). Motivation to study music in Australian schools: The impact of music learning,

gender, and socio-economic status. *Research Studies in Music Education, 37*(2), 141-160.

McPherson, G. E., & Renwick, J. M. (2011). Self-regulation and mastery of musical skills. In B. J. Zimmerman & D. H. Schunk (Eds.), *Handbook of self-regulation of learning and performance* (pp. 234-248). New York: Routledge.

McPherson, G. E., & Zimmerman, B. J. (2002). Self-regulation of musical learning: A social cognitive perspective. In R. Colwell & C. Richardson (Eds.), *The new handbook of research on music teaching and learning* (pp. 327-347). New York, NY: Oxford University Press.

Menard, S. (2010). Path analysis. In N. J. Salkind (Ed.), *Encyclopedia of research design* (pp. 1019-1023). Thousand Oaks, CA: Sage Publications.

Messick, S. (1989). Validity. In R. L. Linn (Ed.), *Educational measurement* (3rd ed., pp. 13-103). New York: Macmillan.

Messick, S. (1990). Validity of test interpretation and use. Princeton, NJ.

Mettas, A., Karmiotis, I., & Cristoforou, P. (2006). Relationship between students' self-beliefs and attitudes on science achievement in Cyprus: Findings from the third International Mathematics and Science Study (TIMSS). *Euroasia Journal of Mathematics, Science and Technology Education, 2*(1), 41-52.

Miksza, P. (2006). Self-regulatory and motivational variables in the music practice of junior high band students. *Contributions to Music Education, 33*(2), 9-26.

Miksza, P. (2011). Relationships among achievement goal motivation, impulsivity, and the music practice of collegiate brass and woodwinds players. *Psychology of Music, 39*(1), 50-67.

Miksza, P. (2012). The development of a measure of self-regulated practice behavior for beginning and intermediate instrumental music students. *Journal of Research in Music Education, 59*(4), 321-338.

Miksza, P., Prichard, S., & Sorbo, D. (2012). An observational study of intermediate band students' self-regulated practice behaviors. *Journal of Research in Music Education, 60*(3), 254-266.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. Thousand Oaks, CA: SAGE Publications.

Miller, M. D. (2010). Classical test theory reliability. In P. Peterson, E. Baker & B. McGaw (Eds.), *International encyclopaedia of education* (pp. 27-30). Retrieved from Elsevier databse.

Ministry of Education Malaysia. (2013). *Malaysia education blueprint 2013-2025 (preschool to post-secondary education)*. Putrajaya, Malaysia: Ministry of Education Malaysia.

Ministry of Education Malaysia. (2015). *Malaysia education blueprint 2015-2025 (higher education)*. Putrajaya, Malaysia: Ministry of Education Malaysia.

Ministry of Higher Education Malaysia. (2010). *Future directions of music education in Malaysian public higher education institutions*. Putrajaya, Malaysia: UKM Press.

Mishra, S., & Khare, D. (2014). On comparative performance of multiple imputation methods for moderate to large proportions of missing data in clinical trials: A simulation study. *Journal of Medical Statistics and Informatics, 2*(9), 1-7.

Mislevy, R. J. (1986). Bayes modal estimation in item response models. *Psychometrika, 51*(2), 177-195.

Moore, K. S., & Hanson-Abromeit, D. (2015). Theory-guided therapeutic function of music to facilitate emotion regulation development in preschool-aged children. *Frontiers in Human Neuroscience, 9,* 1-12.

Morgan, D. (2007). Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research, 1*(1), 48-76.

Mota, G. (1999). Young children's motivation in the context of classroom music: An exploratory study about the role of music content and teaching style. *Bulletin of the Council for Research in Music Education, 141*, 119-123.

Mullis, I. V. S., Martin, M. O., Foy, P., & Arora, A. (2012). *TIMSS 2011 international results in mathematics*. Chestnut Hill, MA: TIMSS & PIRLS International Study Center, Boston College.

Myers, L. S., Gamst, G., & Guarino, A. J. (2006). *Applied multivariate research: Design and interpretation*. London SAGE Publications.

Nielsen, S. G. (2004). Strategies and self-efficacy beliefs in instrumental and vocal individual practice: a study of students in higher music education. *Psychology of Music, 32*(4), 418-431.

Nielsen, S. G. (2008). Achievement goals, learning strategies and instrumental performance. *Music Education Research, 10*(2), 235-247.

Nielsen, S. G. (2010). Epistemic beliefs and self-regulated learning in music students. *Psychology of Music, 40*(3), 324-338.

Nor, M. M. (2011). Develop human capital through music education in Malaysia. *Academic Research International, 1*(2), 220-227.

O'Brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality and Quantity, 41*(5), 673-690.

O'Cathain, A. (2010). Assessing the quality of mixed methods research: Toward a comprehensive framework. In A. Tashakkori & C. Teddlie (Eds.), *SAGE handbook of mixed methods in social and behavioral research* (pp. 531-555). Thousand Oaks, CA: SAGE Publications.

OECD. (2007). *PISA 2006: Science competencies for tomorrow's world*. Paris: OECD Publishing.

OECD. (2009). *PISA 2006 technical report*. Paris: OECD Publishing.

OECD. (2012a). *Let's read them a story! The parent factor in education*. Paris: OECD Publishing.

OECD. (2012b). *PISA 2009 technical report*. Paris: OECD Publishing.

OECD. (2013a). *OECD guidelines on measuring subjective well-being*. Paris: OECD Publishing.

OECD. (2013b). *PISA 2012 assessment and analytical framework: Mathematics, reading, science, problem solving and financial literacy*. Paris: OECD Publishing.

OECD. (2013c). *PISA 2012 results: Ready to learn: Students' engagement, drive and self-beliefs (volume III)*. Paris: PECD Publishing.

Onwuegbuzie, A. J., & Collins, K. M. T. (2007). A typology of mixed methods sampling designs in social science research. *The Qualitative Report, 12*(2), 281-316.

Overland, C. (2014). Statistical power in the Journal of Research in Music Education (2000-2010): A retrospective power analysis. *Bulletin of the Council for Research in Music Education, 201*, 43-59.

Pajares, F. (1996). Self-efficacy beliefs and mathematical problem-solving of gifted students. *Contemporary Educational Psychology, 21*(4), 325-344.

Pajares, F., & Graham, L. (1999). Self-efficacy, motivation constructs, and mathematics performance of entering middle school students. *Contemporary Educational Psychology, 24*(2), 124-139.

Pajares, F., & Miller, M. D. (1995). Mathematics self-efficacy and mathematics performances: The need for specificity of assessment. *Journal of Counseling Psychology, 42*(2), 190-198.

Pajares, F., Miller, M. D., & Johnson, M. J. (1999). Gender differences in writing self-beliefs of elementary school students. *Journal of Educational Psychology, 91*(1), 50-61.

Papageorgi, I. (2014). Developing and maintaining expertise in musical performance. In G. F. Welch & I. Papageorgi (Eds.), *Advanced musical performance: Investigations in higher education learning* (pp. 303-318). Surrey, England: Ashgate Publishing.

Papageorgi, I., & Hallam, S. (2010). Issues of assessment and performance. In S. Hallam & A. Creech (Eds.), *Music education in the 21st century in the United Kingdom* (pp. 141-158). Bedford Way, London: Institute of Education, University of London.

Parducci, A., & Wedell, D. H. (1986). The category effect with rating scales: Number of categories, number of stimuli, and method of presentation. *Journal of Experimental Psychology: Human Perception and Performance, 12*(4), 496-516.

Parkes, K. A. (2010). Performance assessment: Lessons from performers. *International Journal of Teaching and Learning in Higher Education, 22*(1), 98-106.

Parkes, K. A., & Jones, B. D. (2011). Students' motivations for considering a career in music performance. *Update: Applications of Research in Music Education, 29*(2), 20-28.

Parkes, K. A., & Jones, B. D. (2012). Motivational constructs influencing undergraduate students' choices to become classroom music teachers or music performers. *Journal of Research in Music Education, 60*(1), 101-123.

Pascoe, B. J., & Waugh, R. F. (2001). The measurement of student achievement in music using a Rasch measurement model. *Australian Journal of Education, 45*(1), 90-110.

Pascoe, R., Leong, S., MacCallum, J., Mackinlay, E., Marsh, K., Smith, B., Church, T., & Winterton, A. (2005). *National review of school music education: Augmenting the diminished*. Australia: Australian Government Department of Education, Science and Training.

Patton, M. Q. (2015). *Qualitative research and evaluation methods: Integrating theory and practice* (4th ed.). Thousand Oaks, CA: SAGE Publications.

Phan, H. P. (2012). Relations between informational sources, self-efficacy and academic achievement: A developmental approach. *Educational Psychology, 32*(1), 81-105.

Pintrich, P. R., & DeGroot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology, 82*(1), 33-40.

Polkinghorne, D. E. (2005). Language and meaning: Data collection in qualitative research. *Journal of Counseling Psychology, 52*(2), 137-145.

Preston, C. C., & Colman, A. M. (2000). Optimal number of response categories in rating scales: Reliability, validity, discriminating power, and respondent preferences. *Acta Psychologica, 104*(1), 1-15.

Pyett, P. M. (2003). Validation of qualitative research in the "real world". *Qualitative Health Research, 13*(8), 1170-1179.

QAA. (2008). *Subject benchmark statement: Music*. UK: QAA.

Randles, C. (2010). The relationship of compositional experiences of high school instrumentalists to music self-concept. *Bulletin of the Council for Research in Music Education, 184*, 9-20.

Rasch, G. (1960). *Probabilistic models for some intelligence and attainment tests*. Denmark: Danmarks Pædagogiske Institut.

Renwick, J. M. (2008). *Because I love playing my instrument: Young musicians' internalised motivation and self-regulated practising behaviour*. (Doctoral dissertation), University of New South Wales, Sydney, Australia. Retrieved from http://handle.unsw.edu.au/1959.4/36701

Renwick, J. M., & McPherson, G. E. (2002). Interest and choice: Student-selected repertiore and its effect on practising behaviour. *British Journal of Music Education, 19*(2), 173-188.

Renwick, J. M., & McPherson, G. E. (2009). Age-related changes in young musicians' beliefs about their autonomy, competence and values. In W. Baker (Ed.), *Musical understanding: Proceedings of the Australian Society for Music Education XVII National Conference* (pp. 148-153). Launceston, TAS: Australian Society for Music Education.

Renwick, J. M., & Reeve, J. (2012). Supporting motivation in music education. In G. E. McPherson & G. F. Welch (Eds.), *The Oxford handbook of music education* (Vol. 1, pp. 143-162). New York: Oxford University Press.

Revilla, M. A., Saris, W. E., & Krosnick, J. A. (2014). Chosing the number of categories in agree-disagree scales. *Sociological Methods and Research, 43*(1), 73-97.

Ritchie, L., & Williamon, A. (2012). Self-efficacy as a predictor of musical performance quality. *Psychology of Aesthetics, Creativity, and the Arts, 6*(4), 334-340.

Rosevear, J. C. (2007). Academic achievement and music: What's the connection? In A. Stanberg, J. McIntosh & R. Faulkner (Eds.), *Celebrating musical communities: Proceedings of the 40th Anniversary National Conference, Perth 6th-8th July 2007* (pp. 178-181). Nedlands, WA: Australian Society for Music Education.

Rosevear, J. C. (2008). *Engaging adolescents in high school music.* (Doctoral dissertation), University of Adelaide, Australia. Available from University of Adelaide Digital Theses.

Rosevear, J. C. (2010). Attributions for success: Exploring the potential impact on music learning in high school. *Australian Journal of Music Education, 1*, 17-24.

Rotgans, J. I., & Schmidt, H. G. (2010). The Motivated Strategies for Learning Questionnaire: A measure for students' general motivational beliefs and learning strategies? *The Asia-Pacific Education Researcher, 19*(2), 357-369.

Rutkowski, J., Thompson, K. P., & Huang, Y. T. (2011). Cited quantitative research articles in music education research journals, 1990-2005: A content analysis of selected studies. In P. M. Ward-Steinman (Ed.), *Advances in social-psychology and music education research* (pp. 169-184). Surrey, England: Ashgate Publishing.

Salzberger, T. (2010). Does the Rasch model convert an ordinal scale into an interval scale? *Rasch Measurement Transactions, 24*(2), 1273-1275.

Sang, R. C. (1985). Path analysis of an instructional effectiveness model for instrumental music teaching. *Bulletin of the Council for Research in Music Education, 85*, 195-206.

Sawtelle, V., Brewe, E., & Kramer, L. H. (2012). Exploring the relationship between self-efficacy and retention in introductory Physics. *Journal of Research in Science Teaching, 49*(9), 1096-1121.

Schiefelé, U. (1996). Topic interest, text representation, and quality of experience. *Contemporary Educational Psychology, 21*(1), 3-18.

Schmidt, C. P. (2005). Relations among motivation, performance achievement, and music experience variables in secondary instrumental music students. *Journal of Research in Music Education, 53*(2), 134-147.

Schmidt, C. P. (2007). Intrinsic-mastery motivation in instrumental music: Extension of a higher order construct. *Bulletin of the Council for Research in Music Education, 173*, 7-23.

Schmidt, C. P., Zdzinski, S. F., & Ballard, D. L. (2006). Motivation orientations, academic achievement, and career goals of undergraduate music education majors. *Journal of Research in Music Education, 54*(2), 138-153.

Schmidt, R., Boraie, D., & Kassabgy, O. (1996). Foreign language motivation: Internal structure and external connections. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 443-453). San Diego: Academic Press.

Schumacker, R. E. (2010a). Classical Test Analysis. Retrieved January 6th, 2016, from http://appliedmeasurementassociates.com/ama/assets/File/CLASSICAL_TEST_ANALYSIS.pdf

Schumacker, R. E. (2010b). Standards for interpreting reliability coefficients. Retrieved May 6th, 2015, from http://www.appliedmeasurementassociates.com/ama/assets/File/Standards_20for_20Interpreting_20Reliability_20Coefficients.pdf.html

Schumacker, R. E., & Lomax, R. G. (2016). *A beginner's guide to structural equation modeling* (4th ed.). New York, NY: Taylor and Francis.

Schunk, D. H., & Pajares, F. (2010). Self-efficacy beliefs. In P. Peterson, E. Baker & B. McGaw (Eds.), *International encyclopaedia of education* (pp. 668-672). Retrieved from Elsevier database.

Sha, L., Schunn, C., Bathgate, M., & Ben-Eliyahu, A. (2016). Families support their children's success in science learning by influencing interest and self-efficacy. *Journal of Research in Science Teaching, 53*(3), 450-472.

Sharkness, J., & DeAngelo, L. (2011). Measuring student involvement: A comparison of classical test theory and item response theory in the construction of scales from student surveys. *Research in Higher Education, 52*(5), 480-507.

Shavelson, R. J., Hubner, J. J., & Stanton, G. C. (1976). Validation of construct interpretations. *Review of Educational Research, 46*(3), 407-441.

Sichivitsa, V. O. (2007). The influences of parents, teachers, peers and other factors on students' motivation in music. *Research Studies in Music Education, 29*(1), 55-68.

Simons, J., Capio, C. M., Adriaenssens, P., Delbroek, H., & Vandenbussche, I. (2012). Self-concept and physical self-concept in psychiatric children and adolescents. *Research in Developmental Disabilities, 33*(3), 874-881.

Skaalvik, E. M., Federici, R. A., & Klassen, R. M. (2015). Mathematics achievement and self-efficacy: Relations with motivation for mathematics. *International Journal of Educational Research, 72*, 129-136.

Skinner, B. F. (1953). *Science and human behavior*. New York: Free Press.

Sloboda, J., Davidson, J. W., Howe, M. J. A., & Moore, D. G. (1996). The role of practice in the development of performing musicians. *British Journal of Psychology, 87*(2), 287-309.

Smith, A. B., Rush, R., Fallowfield, L. J., Velikova, G., & Sharpe, M. (2008). Rasch fit statistics and sample size considerations for polytomous data. *BMC Medical Research Methodology, 8*(33), 33-43.

Smith, B. P. (2005). Goal orientation, implicit theory of ability, and collegiate instrumental music practice. *Psychology of Music, 33*(1), 36-57.

Smith, B. P. (2011). Motivation to learn music: A discussion of some key elements. In R. Colwell & P. R. Webster (Eds.), *MENC handbook of research on music learning. Volume 1: Strategies* (pp. 265-299). Oxford: Oxford University Press.

Smith, E. V. (2004). Evidence for the reliability of measures and validity of measure interpretation: A Rasch measurement perspectives. In E. V. Smith & R. M. Smith (Eds.), *Introduction to Rasch measurement*. Maple Grove, Minnesota: JAM Press.

Sousa, D. (2014). Validation in qualitative research: General aspects and specificities of the descriptive phenomenological method. *Qualitative Research in Psychology, 11*(2), 211-227.

Stefanic, N. (2015). Structural equation modeling and multilevel modeling in music education. In C. Randles (Ed.), *Music education: Navigating the future* (pp. 299-313). New York, NY: Routledge.

Stephenson, K. G., Quintin, E. M., & South, M. (2016). Age-related differences in response to music-evoked emotion among children and adolescents with Autism Spectrum Disorders. *Journal of Autism and Developmental Disorder, 46*(4), 1142-1151.

Stevens, S. S. (1946). On the theory of scales of measurement. *Science, 103*(2684), 677-680.

Sullivan, L. (Ed.). (2009). *The SAGE glossary of the social and behavioral sciences*. Thousand Oaks, CA: Sage Publications.

Suzuki, S. (1973). Children can develop their ability to highest standard. In E. Mills & T. C. Murphy (Eds.), *The Suzuki concept: An early introduction to a successful method for early music education* (pp. 9-16). California: Diablo Press.

Swindells, R., & de Bézenac, C. (2014). Music, motivation and competence acquisition across genres. In W. Graham & I. Papageorgi (Eds.), *Advanced musical performance: Investigations in higher education learning* (pp. 115-128). Surrey, England: Ashgate Publishing.

Takagi, A. (2003). The effects of early childhood language learning experience on motivation towards learning English: A survey of public junior high school students. *JASTEC Journal, 22*, 47-71.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education, 2*, 53-55.

Teddlie, C., & Johnson, B. (2009). Methodological thought since the 20th century. In C. Teddlie & A. Tashakkori (Eds.), *Foundations of mixed methods research: Integrating quantitative and qualitative techniques in the social and behavioral sciences* (pp. 62-82). Thousand Oaks, CA: Sage Publications.

Teddlie, C., & Yu, F. (2007). Mixed methods sampling: A typology with examples. *Journal of Mixed Methods Research, 1*(1), 77-100.

Tennant, A., & Pallant, J. F. (2006). Unidimensionality matters! (A tale of two Smiths?). *Rasch Measurement Transactions, 20*(1), 1048-1051.

Thompson, B. (2004). *Exploratory and confirmatory factor analysis: Understanding concepts and applications*. Washington, DC: American Psychological Association.

Thompson, S., & Williamon, A. (2003). Evaluating evaluation: Musical peroformance assessment as a research tool. *Music Perception: An Interdisciplinary Journal, 21*(1), 21-41.

Thorndike, E. L. (1932). *The fundamentals of learning*. New York: Teachers College Press.

Tremblay, K., Lalancette, D., & Roseveare, D. (2013). *Assessment of higher education learning outcomes feasibility study report: Volume 1 - design and implementation*. Paris: OECD Publishings.

Triantafyllaki, A. (2005). A call for more instrumental music teaching research. *Music Education Research, 7*(3), 383-387.

Tye, J. K. C. (2004). *A survey of the current status and practices of piano teachers in Penang, Malaysia: Preparation for the practical piano examinations of the Associated Board of the Royal Schools of Music, London.* (Doctoral dissertation), University of South Carolina, USA. Available from ProQuest Dissertations Publishing (UMI 3157191).

van Teijlingen, E. R., & Hundley, V. (2001). The importance of pilot studies. *Social Research Update, 35*, 1-4.

Vaughan, P. W. (2007). Path analysis. In R. F. Baumeister & K. D. Vohs (Eds.), *Encyclopedia of social psychology* (pp. 650-653). Thousand Oaks, CA: Sage Publications.

Vaughan, T., Harris, J., & Caldwell, B. J. (2011). *Bridging the gap in school achievement through the arts: Summary reports*. Victoria, Australia: The Song Room.

Vellymalay, S. K. N. (2011). A study of the relationship between Indian parents' education level and their involvement in their children's education. *Kajian Malaysia, 29*(2), 47-65.

Villalón, R., Mateos, M., & Cuevas, I. (2015). High school boys' and girls' writing conceptions and writing self-efficacy beliefs: What is their role in writing performance? *Educational Psychology, 35*(6), 653-674.

Wade, S. E. (2001). Research on importance and interest: Implications for curriculum development and future research. *Educational Psychology Review, 13*(3), 243-261.

Warm, T. A. (1989). Weighted likelihood estimation of ability in item response theory. *Psychometrika, 54*(3), 427-450.

Watson, A. (2007). Valuing Music Education. In A. Stanberg, J. McIntosh & R. Faulkner (Eds.), *Celebrating musical communities: Proceedings of the 40th Anniversary National Conference, Perth 6th-8th July 2007* (pp. 212-215). Nedlands, WA: Australian Society for Music Education.

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review, 92*(4), 548-573.

Welch, G. F., & Papageorgi, I. (Eds.). (2014). *Advanced musical performance: Investigations in higher education learning*. Surrey, England: Ashgate Publishing.

Wesolowski, B. C. (2012). Understanding and developing rubrics for music performance assessment. *Music Educators Journal, 98*(3), 36-42.

Wesolowski, B. C., Wind, S. A., & Engelhard, G. (2015). Rater fairness in music performance assessment: Evaluating model-data fit and differential rater functioning. *Musicae Scientiae, 19*(2), 147-170.

Wesolowski, B. C., Wind, S. A., & Engelhard, G. (2016). Rater analyses in music performance assessment: Application of the Many Facet Rasch Model. In T. S. Brophy, J. Marlatt & G. K. Ritcher (Eds.), *Connecting practice, measurement and evaluation: Selected papers from the 5th International Symposium on Assessment in Music Education* (pp. 335-356). Chicago, IL: GIA.

Wigfield, A., & Cambria, J. (2010). Expectancy-value theory: Retrospective and prospective. In T. C. Urdan & S. A. Karabenick (Eds.), *The decade ahead: Theoretical perspectives on motivation and achievement* (Vol. 16a, pp. 35-70). West Yorkshire, UK: Emerald Group Publishing Limited.

Wigfield, A., & Eccles, J. S. (1992). The development of achievement task values: A theoretical analysis. *Developmental Review, 12*(3), 265-310.

Wigfield, A., & Eccles, J. S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology, 25*(1), 68-81.

Wigfield, A., & Eccles, J. S. (2002). The development of competence beliefs, expectancies for success , and achievement values from childhood through adolescence. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 91-120). San Diego, CA: Academic Press.

Wigfield, A., Eccles, J. S., Yoon, K. S., Harold, R. D., Arberton, A. J. A., Freedman-Doan, C., & Blumenfeld, P. C. (1997). Changes in children's competence beliefs and

subjective task values across the elementary school years: A 3-year study. *Journal of Educational Psychology, 89*(3), 451-469.

Williamon, A., & Valentine, E. (2000). Quantity and quality of musical practice as predictors of performance quality. *British Journal of Psychology, 91*(3), 353-376.

Wills, A. M. (2011). *Relationships among musical home environment, parental involvement, demographic characteristics, and early childhood music participation.* (Doctoral dissertation), University of Miami, USA. Available from Open Access Theses. (Paper 243).

Wilson, M. (2005). *Constructing measures: An item response modeling approach*. Mahwah, NJ: Lawrence Erlbaum Associates.

Winne, P. H., & Hadwin, A. F. (2010). Self-regulated learning and socio-cognitive theory. In P. Peterson, E. Baker & B. McGaw (Eds.), *International encyclopedia of education* (3rd ed., pp. 503-508). Retrieved from Elsevier database.

Wolters, C. A., & Mueller, S. A. (2010). Motivation regulation. In P. Peterson, E. Baker & B. McGaw (Eds.), *International encyclopedia of education* (3rd ed., pp. 631-635). Retrieved from Elsevier databse.

Woodcock, R. W. (2012). What can Rasch-based scores convey about a person's test performance? In S. E. Embretson & S. L. Hershberger (Eds.), *The new rules of measurement: What every psychologist and educator should know* (pp. 105-128). New York, NY: Psychology Press.

Woodcock, R. W., & Dahl, M. N. (1971). *A common scale for the measurement of person ability and test item difficulty*. (AGS Paper No. 10). American Guidance Service, Circle Pines, MN.

Wright, B. D. (1996). Comparing Rasch measurement and factor analysis. *Structural Equation Modeling: A Multidisciplinary Journal, 3*(1), 3-24.

Wright, B. D. (1998). Model selection: Rating Scale Model (RSM) or Partial Credit Model (PCM)? *Rasch Measurement Transactions, 12*(3), 641-642.

Wright, B. D. (1999). Rasch measurement models. In G. N. Masters & J. P. Keeves (Eds.), *Advances in measurement in educational research and assessment* (pp. 85-97). The Netherlands: Pergamon.

Wright, B. D. (2012). Fundamental measurement for psychology. In S. E. Embretson & S. L. Hershberger (Eds.), *The new rules of measurement: What every psychologist and educator should know* (pp. 65-104). New York, NY: Psychology Press.

Wright, B. D., & Mok, M. M. C. (2004). An overview of the family of Rasch measurement models. In E. V. Smith & R. M. Smith (Eds.), *Introduction to Rasch measurement: Theory, models and applications* (pp. 1-24). Maple Grove, Minnesota: JAM Press.

Wrigley, W. J. (2005). *Improving music performance assessment.* (Doctoral Dissertation), Griffith University, Queensland, Australia. Retrieved from https://www120.secure.griffith.edu.au/rch/items/5b8cdfb9-1bdf-7145-90db-0e351e58f0cf/1/

Wrigley, W. J., & Emmerson, S. B. (2013). Ecological development and validation of a music performance rating scale for five instrument families. *Psychology of Music, 41*(1), 97-118.

Wu, M. L., & Adams, R. J. (2007). *Applying the Rasch model to psycho-social measurement*. Melbourne: Educational Measurement Solutions.

Wu, M. L., Adams, R. J., Wilson, M., & Haldane, S. A. (2007). ConQuest version 2: Generalised item response modelling software [Computer software]. Camberwell, VIC: ACER Press.

Yang, Y., & Gustafsson, J. E. (2004). Measuring socioeconomic status at individual and collective levels. *Educational Research and Evaluation, 10*(3), 259-288.

Yarbrough, C. (2002). The first 50 years of the Journal of Research in Music Education: A content analysis. *Journal of Research in Music Education, 50*(4), 276-279.

Zdzinski, S. F. (1992). Relationships among parental involvement, music aptitude, and musical achievement of instrumental music students. *Journal of Research in Music Education, 40*(2), 114-125.

Zdzinski, S. F. (1996). Relationships among parental involvement, selected student attributes, and learning outcomes in instrumental music. *Journal of Research in Music Education, 44*(1), 34-48.

Zdzinski, S. F. (2002). Parental involvement, musical achievement, and music attitudes of vocal and instrumental music students. *Contributions to Music Education, 29*(2), 29-45.

Zdzinski, S. F. (2011). Development of a social environment of instruction model for music education. In P. M. Ward-Steinman (Ed.), *Advances in social-psychology and music education research* (pp. 85-92). England: Ashgate Publishing Limited.

Zdzinski, S. F., & Barnes, G. V. (2002). Development and validation of a string performance rating scale. *Journal of Research in Music Education, 50*(3), 245-255.

Zelenak, M. S. (2015a). Measuring the sources of self-efficacy among secondary school music students. *Journal of Research in Music Education, 62*(4), 389-404.

Zelenak, M. S. (2015b). Methodological trends in music education research. In C. Randles (Ed.), *Music education: Navigating the future* (pp. 235-252). New York, NY: Routledge.

Zhang, L. F. (2000). University students' learning approaches in three cultures: An investigation of Biggs's 3P model. *The Journal of Psychology, 134*(1), 37-55.

Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology, 81*(3), 329-339.

Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. *Educational Psychologist, 25*(1), 3-17.

Zumbo, B. D., & Chan, E. K. H. (2014). Setting the stage for validity and validation in social, behavioral, and health sciences: Trends in validation practices. In B. D. Zumbo & E. K. H. Chan (Eds.), *Validity and validation in social, behavioral, and health sciences* (pp. 3-8). Switzerland: Springer International Publishing.